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Application for a Certificate of Environmental Compatibility

Morenci Water & Electric 345kV Intertie Project

Prepared for
State of Arizona Power Plant and
Transmission Line Siting Committee

Submitted by
Morenci Water & Electric, Inc.

Date: _____

Case No. _____

DOCKET NO. L-00000N-99-0097

**Application for a
Certificate of Environmental Compatibility**

**Morenci Water & Electric Company
345kV Intertie Project**

Prepared for:

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

Submitted by:

Morenci Water & Electric Company

Date: _____

Case No. _____

BEFORE THE
POWER PLANT AND TRANSMISSION LINE SITING COMMITTEE

In the matter of the Application of Morenci)
Water & Electric Company, in conformance)
with the requirements of Arizona Revised)
Statutes 40-360.03 and 40-360.06, for a)
Certificate of Environmental Compatibility)
authorizing construction of a 345kV)
transmission line, a 345/230/24.9kV)
substation and expanding the TEP Greenlee)
Substation in Greenlee County, Arizona. The)
345kV TEP to Copper Verde transmission)
line will be between the TEP Greenlee)
Substation (T5S, R31E, Section 29) east of)
the intersection of SR 191 and SR 78 to the)
proposed Copper Verde Substation (T5S, R29E,)
Section 1) south of Morenci, Arizona, a)
distance of approximately 11 miles.)
_____)

Case _____

APPLICATION FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY

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LIST OF ACRONYMS

AC	alternating current
AEPCO	Arizona Electric Power Cooperative, Inc.
ASLD	Arizona State Land Department
BLM	Bureau of Land Management
CCC	Civilian Conservation Corps
dB	decibels
dBA	A-weighted decibels
EA	environmental assessment
EMF	electric and magnetic field
EPG	Environmental Planning Group, Inc.
FONSI	Finding of No Significant Impact
kV	kilovolt
kV/m	kilovolts per meter
mG	milliGauss
MW	megawatt
MW&E	Morenci Water & Electric Company
NHPA	National Historic Preservation Act
PDMI	Phelps Dodge Mining, Inc.
SR	State Route
TEP	Tucson Electric Power Company
V/m	volts per meter

**APPLICATION FOR A
CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY**

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

1. Name and address of the applicant:

Morenci Water & Electric Company
66 Fairbanks Road
Morenci, AZ 85540

2. Name, address and telephone number of a representative of the 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:

D.L. True
Morenci Water & Electric Company, Superintendent
(520) 865-6219
Morenci Water & Electric Company
66 Fairbanks Road
Morenci, AZ 85540

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

November 5, 1999

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:

345 kilovolt (kV) alternating current (AC) single and
345kV and 230kV AC double circuit

4.2.1.2 Description of proposed structures:

The new Morenci Water & Electric Company (MW&E) 345kV transmission line will be constructed using primarily H-frame self-weathering steel structures (see Exhibits G-1 and G-2). These structures are being used to match the existing 230kV wood H-frame transmission line located adjacent to the proposed route for the majority of its length. Matching the existing structures will reduce potential visual impacts. Typically, the height of the structures would range from approximately 90 to 110 feet for tangent structures and 80 to 95 feet for dead-end and angle structures. Structure diameter at grade would be typically 24 inches for tangent structures and 30 inches for dead-end and angle structures.

A portion of the 345kV transmission line may be double circuited (230/345kV) from the AEPCO Morenci Substation to the new Copper Verde Substation (approximately 4.5 miles in length).

4.2.1.3 Description of proposed switchyards and substations:

The 345kV transmission line will originate in the existing Tucson Electric Power (TEP) Greenlee Substation. A 345kV circuit breaker position will be added to the existing 345kV ring bus to provide a termination point for the new 345kV line. This will require the addition of structures and buswork, switches, and modifications to the existing relaying schemes. The area required for the TEP Greenlee Substation modification is approximately 230 feet by 610 feet (approximately 3.2 acres).

The 345kV transmission line will terminate on a dead-end structure adjacent to the 345kV ring bus of a new 345/230kV substation named Copper Verde Substation (see Exhibit G-3). The substation layout will include three 345kV circuit breakers, two 120/160/200 megavolt amperes, and 345/230/24.9kV auto-transformers feeding a five-position 230kV ring bus.

4.2.1.4 Purpose for constructing said transmission line:

MW&E serves electricity to its residential and commercial customers in the Morenci and Clifton areas, and its industrial customer Phelps Dodge Mining, Inc. (PDMI). To supply its customers with electricity, MW&E purchases power from electricity suppliers within the western United States, including the Arizona Electric Power Cooperative, Inc. (AEPCO). The

power purchases are delivered to MW&E customers using the extra-high voltage interconnected transmission grid, the AEPCO transmission system, and AEPCO's single 230kV transmission line connecting AEPCO's transmission system to MW&E.

MW&E is proposing the 345kV Intertie Project as a reinforcement for the existing AEPCO transmission system to meet the need for both increased load-serving capability and increased reliability for MW&E customers. Over the last several years, the peak electrical load for MW&E customers has grown from 170 megawatts (MW) in 1993 to the current 220 MW. This increase in electrical load is based in part on the shift of PDMI's mining production methods. These methods are more sensitive to power outages than in the past. Increasing the reliability of the transmission system is necessary to minimize the loss of costly downtime in mining production that results from a power disturbance. MW&E currently receives 135 MW through firm (or non-interruptible) power contracts and 85 MW (from 135 MW to 220 MW) through non-firm (or interruptible) power contracts via the AEPCO transmission system.

The 345kV Intertie Project would accomplish the following:

- provide the additional 85 MW (from 135 MW to 220 MW) of firm transmission capability needed to satisfy MW&E's current electrical load
- reinforce the transmission delivery system to provide reliable and increased load-serving capability to support continuing load growth to MW&E customers
- increase the reliability of the MW&E electrical system by creating a looped transmission system to provide a second transmission path to supply MW&E customers with power during system disturbances
- provide supplemental access to the western United States' interconnected electrical grid to allow MW&E to purchase power and optimize the terms of its power purchase agreements

- provide for de-energized maintenance of the existing AEPCO 230kV facilities, resulting in additional operating flexibility, increased maintenance efficiency, lower overall operating costs, and enhanced worker safety
- achieve compliance with Western Systems Coordinating Council reliability criteria with regard to single contingency outages and maintenance of service to customers during system outages

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 would originate at the TEP Greenlee Substation located in T5S, R31E, Section 29 and proceed in a northwest direction to the proposed site of the 230/345kV Copper Verde Substation T5S, R29E, Section 1. Approximately 90 percent of the proposed route would be adjacent to and parallel north and east of the existing AEPCO 230kV transmission line right-of-way.

4.2.2.2 Straight line distance between such geographic points:

The straight line distance between the TEP Greenlee Substation and the proposed site of the 230/345kV Copper Verde Substation is approximately 9 miles.

4.2.2.3 Length of the transmission line for each alternate route:

The approximate length is 11 miles.

4.2.3 Detailed Dimensions:

4.2.3.1 Nominal width of right-of-way requested:

MW&E is requesting approval of a total right-of-way width of 150 feet within a general corridor that is 2,000 feet wide. The referenced centerline shown on the maps are the centerline of the general corridor. The exact 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 is approximately 900 to 1,000 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 130 feet above existing grade. The typical height of the supporting structures will vary from 75 to 130 feet above existing grade.

4.2.3.4 Minimum height of conductor above ground:

30.5 feet

4.2.4 Estimated costs of proposed transmission line and substations:

Costs to construct the proposed project, including construction labor and materials, engineering, construction management, and a 10 percent contingency, are indicated in the following table:

Line Item cost Estimate	Single Circuit Line	Double Circuit Line
345kV Line – Single circuit from TEP Greenlee to Copper Verde Substation	\$4,500,000	X
Option: 345kV Line – Single circuit from TEP Greenlee to AEP CO Morenci Substations (6.4 miles); double circuit from AEP CO Morenci to Copper Verde Substations (4.5 miles)	X	\$5,600,000
Modifications to the TEP Greenlee Substation	\$2,600,000	\$2,600,000
New Copper Verde Substation	\$7,900,000	\$7,900,000
Project Totals	\$15,000,000	\$16,100,000

4.2.5 Description of the Proposed Route:

The proposed route originates at the TEP Greenlee Substation, which is approximately 3.3 miles northeast of the intersection of State Route (SR) 191 and SR 78. For approximately 1.1 miles, the proposed route is located on the south side of the existing AEP CO 230kV right-of-way. Approximately 1,700 feet east of SR 78, the proposed route would cross over the AEP CO 230kV line in a northeast direction, turn to the west, and proceed to the AEP CO Morenci Substation, located approximately 5.8 miles west of its originating point. The proposed project will not intertie with this substation. From the AEP CO Morenci Substation the proposed route turns in a slight northwest direction to T5S, R29E, Section 13. At this point, the proposed route would turn to the north, cross the San Francisco River, and terminate at the proposed site of the 345/230/24.9kV Copper Verde Substation located in T5S, R29E,

Section 1. The proposed route parallels the AEPCO 230kV transmission line right-of-way for approximately 90 percent of its length.

4.2.6 Land Ownership:

The proposed route traverses approximately 5.7 miles of Bureau of Land Management (BLM) land, 4.6 miles of Arizona State Land Department [ASLD]) land, and 0.6 mile of private land (PDMI property) for an overall length of approximately 11 miles.

5. Jurisdictions:

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

Areas of jurisdiction along the proposed route are BLM (5.7 miles), ASLD (4.6 miles), and Greenlee County (0.6 mile). The proposed route lies entirely in Greenlee 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 route is not located contrary to zoning ordinances or master plans of any affected areas of jurisdiction.

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

Project management personnel has been consistent throughout the environmental studies, documentation, and document filing. However, the company names under which personnel have managed the project did change. Project management originally conducted environmental studies, documentation, and document filings under the company name of Dames & Moore. Project management now operates under the company name of Environmental Planning Group, Inc. or EPG.

Under the direction of the BLM, Safford Field Office, the environmental consulting firm of Dames & Moore and EPG, third-party contractors, conducted environmental studies that were utilized in preparation of the environmental assessment (EA) (Exhibit B-2) pursuant to the National Environmental Policy Act. The proposed route is primarily located on lands managed by the BLM and ASLD.

Public and agency scoping, environmental resources inventory, and impact assessments were conducted for the proposed route. Impacts to land use, visual resources, biological resources, cultural resources, geology, soils, socioeconomics, 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 were completed (see Exhibit B-2, Chapter 4).

Approximately 45 miles of preliminary transmission line corridors were evaluated. The majority of the corridors paralleled highways, pipelines, and transmission lines. Some corridors were eliminated based on existing land use constraints (i.e., Greenlee County Airport). Other corridors were less environmentally compatible based on visual impacts to scenic quality and sensitive viewers (pipeline corridor). Please refer to the EA, Chapter 2 for a more detailed discussion of alternative corridors considered.

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 reconnaissances also were conducted. A study corridor 2 miles on each side of the reference centerline (proposed route) was studied for potential visual resource and land use impacts. Detailed cultural surveys were conducted for the proposed route and a report documenting these findings was sent to the State Historic Preservation Office in October 1999 for review. A biological evaluation also was completed for the loach minnow and the Arizona hedgehog cactus (Exhibit D-1). The BLM made a determination that the project will have no effect on these species or their habitats. Additionally, a Native Plant Survey was conducted along the proposed route in compliance with Arizona Department of Agriculture criteria. These studies were conducted between December 1998 and July 1999.

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 defined that would reduce or eliminate impacts. A comprehensive mitigation program to reduce initial impacts will be implemented that may include structure placement to avoid sensitive resources, modified structure design, matching existing structure type, use of nonspecular conductors, overland access (where practical), use of existing access for approximately 90 percent of the proposed route's overall length, biological monitoring, and cultural resource monitoring testing. The mitigation measures are described in detail in the BLM EA (Exhibit B-2, Appendix B).

The public involvement program was developed to identify potential issues and concerns of affected or interested Native American Tribes, agencies, and other individuals. The program included a public open house meeting, mailings, and direct contacts. A fact sheet was mailed to interested parties describing the proposed project and the time and location of the public open house meeting utilizing a BLM provided mailing list. In addition to the fact sheet, notices of the public open house meeting held in Clifton, Arizona, appeared January 20, 1999 and January 27, 1999 in *The Copper Era* and in the *Eastern Arizona Courier*. Comments from the public that were received at the open house meeting and throughout the planning process were incorporated into the evaluation of alternatives and selection of the proposed route. Additionally, the EA was made available to the public on July 19, 1999 for a 30-day review period. The legal notice was published in the above-referenced newspapers and the

Moccasian during the weeks of July 19 and July 26, 1999. See Exhibit J for public comments (Exhibit J-1), public notices (Exhibit J-2), and fact sheet (Exhibit J-3).

The public review period for the EA occurred in July and August 1999. The Finding of No Significant Impact (FONSI) and Decision Record are located in Exhibit B-1. Federal and state agencies also have provided comment and concurrence for the proposed route (see Exhibit J-1 for public response letters).

The BLM's FONSI states:

I have reviewed this environmental assessment including the explanation and resolution of any potentially significant impacts. I have determined that this proposed action with the mitigation described below will not have any significant impacts on the human environment and that an EIS is not required. I have determined that this proposed action is in conformance with the approved land use plan. It is my decision to implement the action with the mitigation measures identified below.

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-2).

7. Rationale for Route Preference:

The proposed route described in this application has been found by MW&E and its environmental consultants Dames & Moore and EPG to be within the range of impacts deemed "environmentally compatible" in past Arizona siting decisions. The BLM also has recommended and approved the proposed route documented in the application (see Decision Record and FONSI in Exhibit B-1). Rationale for the selection of the proposed route follows.

The proposed route is preferred by MW&E based on environmental, system planning, and cost considerations. Environmental advantages include the following:

- No long-term or adverse effects to special status species or unique habitats will result with the construction of the proposed route.
- The proposed route would not constitute a barrier to wildlife movement after construction. Additionally, wildlife habitat fragmentation is not anticipated.
- Visual impacts are anticipated to be lower than comparable sitings of similar transmission lines based on:
 - the proposed route would parallel an existing transmission line and use existing access for approximately 90 percent of the overall length (approximately 11 miles)
 - similar structure types will be used and sited adjacent to the existing transmission line structures (where practical)

- use of non-specular conductors
- Historic properties will be avoided along the proposed route.
- Eight Native American tribes were consulted and no significant issues or concerns were identified.
- The proposed route is consistent with existing management plan objectives.
- Low to indiscernible land use impacts are anticipated; the nearest residence is approximately ½ mile away from the proposed route.
- Audible noise and electric and magnetic fields are not anticipated to be an issue along the proposed route because, as stated above, the nearest residence is approximately ½ mile away from the proposed route.

In sum, the proposed route has the least amount of environmental impacts compared to the alternative routes.

MORENCI WATER & ELECTRIC COMPANY

BY: *D.L. True*

D.L. True
MW&E 345kV Intertie Project Superintendent

EXHIBIT A - MAPS

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 applicant's order of preference."

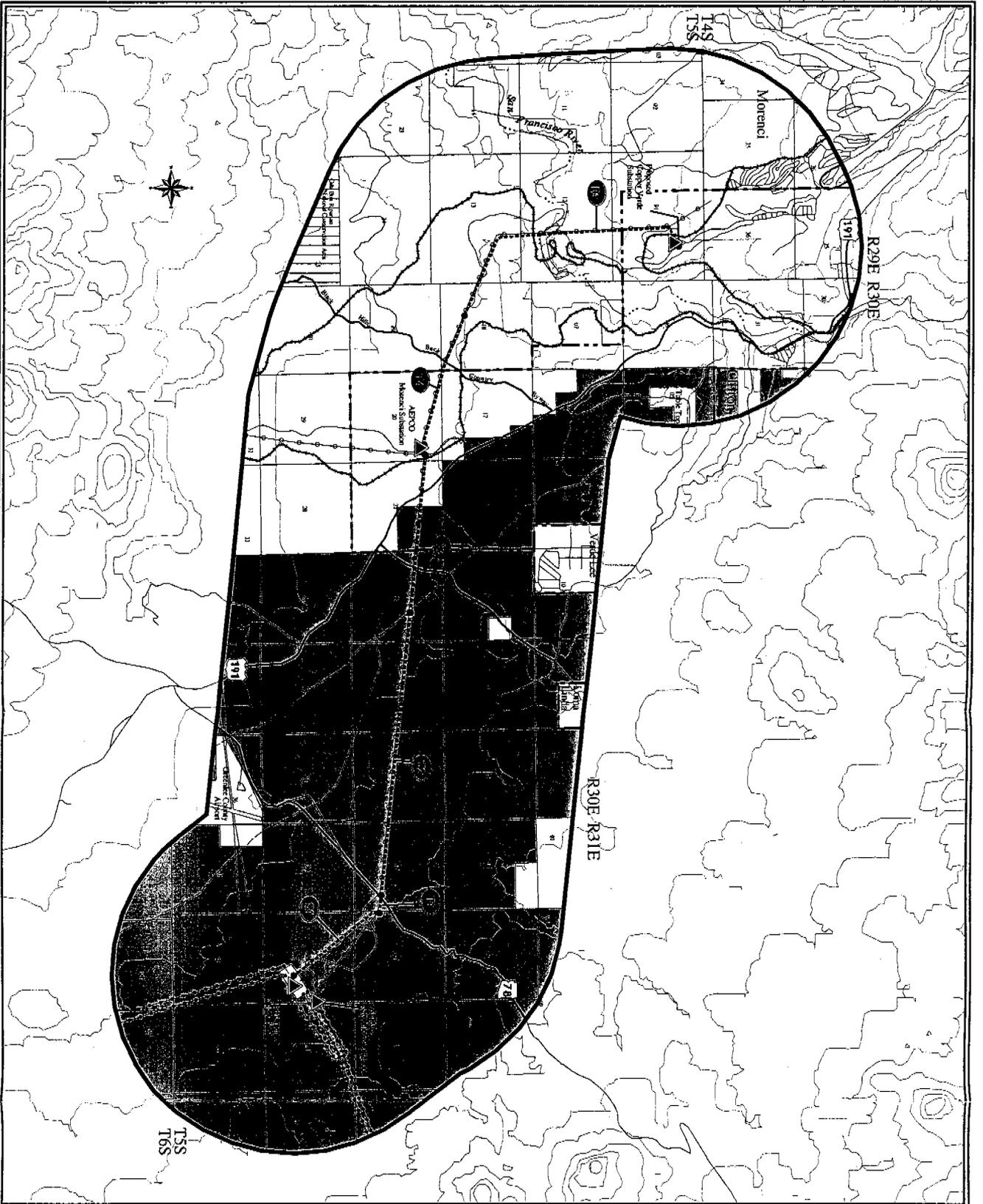
Exhibit A-1: Proposed Route, Jurisdiction and Land Status

Exhibit A-2: Existing and Future Land Use Plans

Exhibit A-3: Alternative Transmission Line Corridors

Detailed land use information is also described in the Bureau of Land Management (BLM) Environmental Assessment (EA) prepared for this project located in Exhibit B-2, under separate cover.

Exhibits A-1 and A-2 are included in this section at 1:62,500 scale. Exhibit A-3 is included in this section at 1:68,600 scale.



Jurisdiction and Land Status

Morenci Water & Power
345kV Inter tie Project

- Other
- State Land
- Bureau of Land Management
- Proposed Route
- Link Identifier for Routes
- Link Node

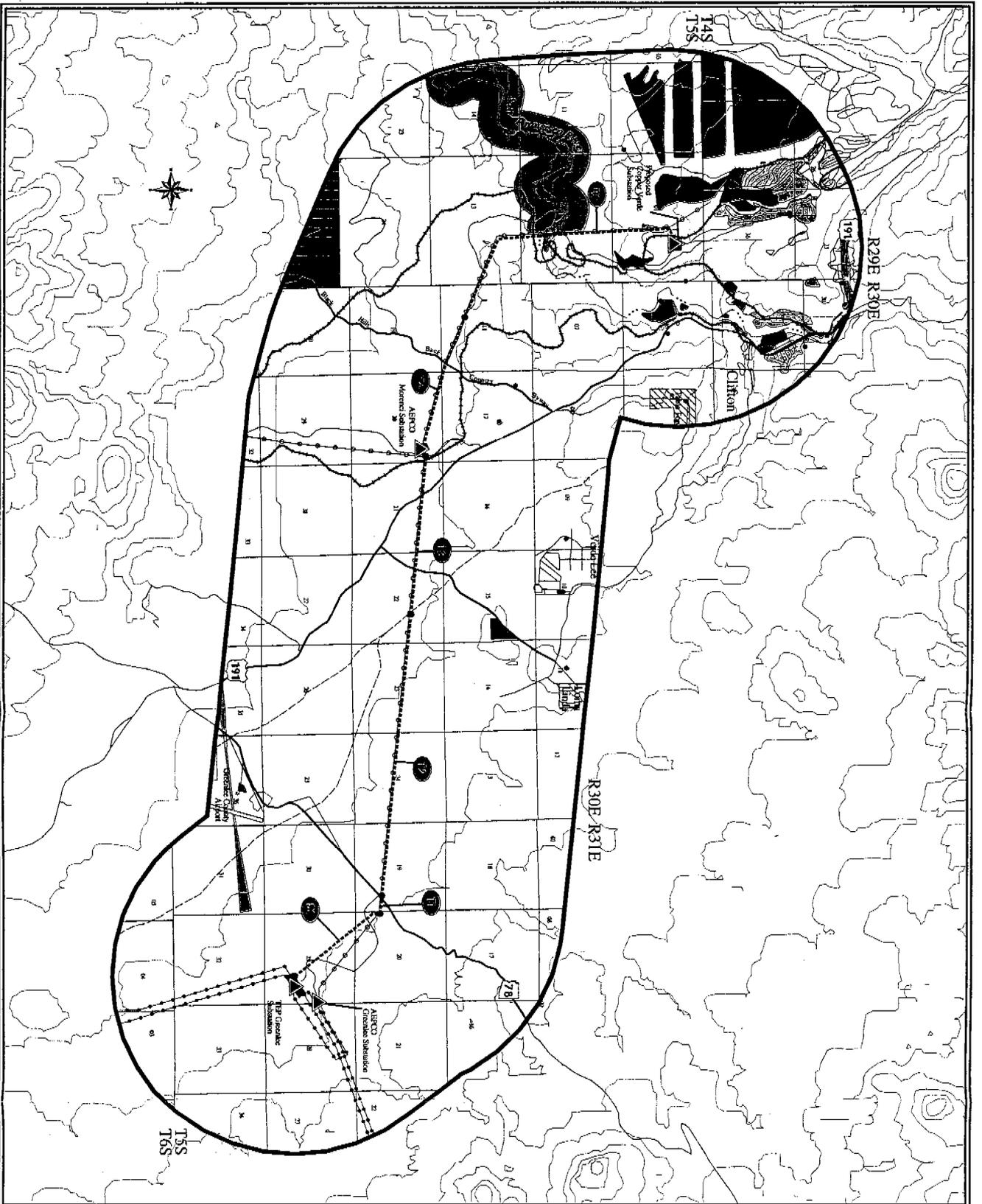
General Reference Features

- ▲ Power Substation
- ▲ Proposed Substation - Final Approval
- Gila Box Riparian National Conservation Area
- 345kV Transmission Line
- 230kV Transmission Line
- Pipeline
- Community Boundaries
- Primary Transportation Routes
- Secondary Transportation Routes
- Railroads
- Study Area Boundary

Scale 1:62,500



Exhibit A-1



Existing and Future Land Use
Morenci Water & Power 345KV Inertic Project

- Residential Low Density
- Residential Medium Density
- Residential High Density
- Commercial
- Mixed Use
- Industrial
- Cereals
- Airport
- Airport Influence Area
- Public/Quasi-Public Facilities
- Schools
- Vacant/Undeveloped
- Parks
- Recreation
- BLM Scientific/Research Study Area
- Proposed Development-Concept Stage
- Church
- Abandoned Church
- Water Tower/Look
- Proposed Reservoir
- Link Candidate for Reservoir
- Link Node

Exhibit A-2

General Reference Features

- Power Substation
- Proposed Substation - Final Approval
- Gila Box Riparian National Conservation Area
- 345KV Transmission Line
- 230KV Transmission Line
- Pipeline
- Community Boundaries
- Primary Transportation Routes
- Secondary Transportation Routes
- Railroads
- Study Area Boundary

Scale 1:62,500

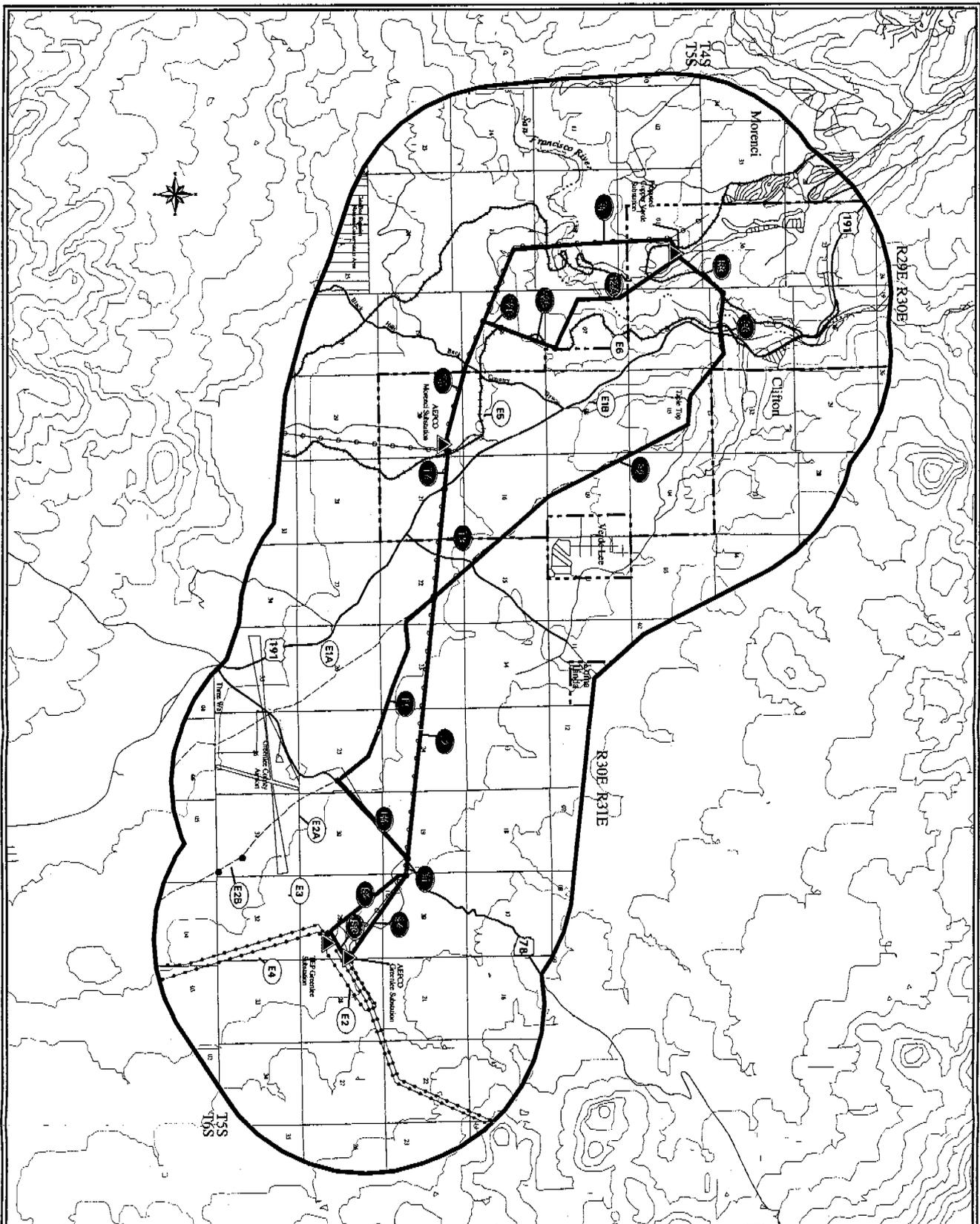


DAMES & MOORE

 1500 K Street, N.W.

 Washington, D.C. 20004

 Project No. 100-100-100-100



Alternative Transmission Line Corridors
 Morenci Water & Electric
 345kV Intertie Project

- Alternative Routes
- Alternative Routes Eliminated
- Link Identifier for Routes
- Link Identifier for Routes Eliminated
- Link Node

General Reference Features

- ▲ Power Substation
- ▭ Proposed Substation - Final Approval
- ▭ Gila Box Riparian National Conservation Area
- 345kV Transmission Line
- 230kV Transmission Line
- Pipeline
- Community Boundaries
- Primary Transportation Routes
- Secondary Transportation Routes
- Railroads
- Study Area Boundary



Scale in Miles
 0 1 2

Morenci Water & Electric Co.
 DAWES & MOORE
 October 1999

Exhibit A-3

EXHIBIT B - ENVIRONMENTAL REPORT

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

"Attach any environmental studies which applicant has made or obtained in connection with the proposed site(s) or route(s). If 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 a part of this exhibit."

Exhibit B-1: Bureau of Land Management Finding of No Significant Impact and Decision Record

Exhibit B-2: Environmental Assessment

The Bureau of Land Management (BLM's) Finding of No Significant Impact and Decision Record are attached as Exhibit B-1.

Under the direction of the BLM, the environmental consulting firms of Dames & Moore and EPG, third-party contractors, conducted environmental studies that were utilized in the preparation of the environmental assessment (enclosed under a separate cover as Exhibit B-2).

LAND USE

Jurisdictions Land Status

The jurisdictions within the study area are shown on Exhibit A-1. The proposed route crosses approximately 5.7 miles of federal lands, 4.6 miles of state land, and 0.6 mile of lands held in private ownership (note: actual distances may vary based on the final survey of the route alignment). Federal lands include BLM lands, which have land and natural resources managed by the Safford Field Office. Unincorporated private lands under the Greenlee County include Morenci, Loma Linda, Verde Lee, and Three Way. Incorporated private land includes the town of Clifton.

Existing and Future Land Use

The majority of the study area is undeveloped. Existing land uses include designated BLM lands, mining, residential, commercial and retail businesses, grazing and livestock facilities, utility corridors, transportation routes, dispersed recreational areas, and the Greenlee County Airport, please refer to Exhibit A-2 for future and existing land uses.

General or master plan documents of Greenlee County and the town of Clifton depict future land uses as they relate to the Greenlee County Airport, county land north of Clifton, and a 120-acre parcel acquired by the town of Clifton. In 1993, Greenlee County retained a third-party consultant to develop a Comprehensive Master Plan for the airport. The document outlines plans to expand or reconfigure the existing runway to allow for larger aircraft to utilize the facility. Greenlee County

also has designated a small amount of planned recreational vehicle use within the floodplain of the San Francisco River, in North Clifton. Additionally, as a result of a flood in 1983, the town of Clifton's Comprehensive Plan (1986) designated 120 acres, Table Top (T5S, R30E, Section 5), for future mixed-use development (high to medium density housing, parks, and public-quasi public facilities).

Recreation

Recreation uses within the study area include parks and designated BLM lands as well as dispersed recreation activities. Several municipal parks and recreation areas were identified within the towns of Morenci and Clifton. The Town of Clifton's Comprehensive Plan (1986) designates a small amount of planned recreational vehicle use within the floodplain of the San Francisco River north of town.

Recreation use on BLM lands within the study area is primarily of a dispersed nature, including off-highway vehicle use, hiking, wildlife viewing and photography, hunting, mountain biking, rafting, picnicking, camping, horseback riding, etc.

Additionally, the Arizona Desert Wilderness Act of 1990 (Public Law 101-628) designated the Gila Box RNCA. The Gila Box RNCA encompasses approximately 21,767 acres of BLM land and 1,720 acres of private land. Portions of the Gila Box RNCA that occur in the study area are within T5S, R29E, Sections 25 and 26.

The Safford District Resource Management Plan, as amended (October 1994) has designated portions of the San Francisco River (T5S, R29E, Section 12; west of the existing AEPCO 230kV right-of-way to the boundary of the Gila Box RNCA) to be further evaluated for "recreational" qualities (Federal Register; 47 FR 39457-9). The Arizona's River Coalition has proposed portions of the San Francisco River, within the study area, for inclusion into the National Wild and Scenic Rivers system (Arizona Rivers: Lifeblood of the Desert, a Citizen's Proposal for the Protection of Rivers in Arizona, 1991). At this time, Congress has not authorized Wild & Scenic River status for any of the segments proposed in the Safford District Resource Management Plan.

A portion of the old Clifton to Safford Road was designated by the BLM as the Black Hills Back Country Byway. Portions of the byway that traverse the study area begin in T5S, R30E Section 8 (at US 191) to T5S, R29E, Section 25. Along this portion of the byway an entrance kiosk and parking pull-out are located in Section 17. As part of this designation, the BLM has provided interpretive information along the byway which includes a description of the public lands' multiple use mandate as it relates to recreation areas, cultural sites, wildlife and biology, and utilities.

Recreation Opportunity Spectrum

The Recreation Opportunity Spectrum (ROS) is a land classification system used to categorize BLM land into six classes. Each ROS classification is defined by its setting, natural or developed, and by the probable recreational experiences and activities that it affords. In the BLM planning process,

ROS classifications are used to help set recreation themes within each of the BLM's management areas. All routes that cross BLM land occur within the Roaded Natural category.

Potential Effects

Construction of the transmission line or the proposed Copper Verde Substation (T5S, R29E, Section 1) would not conflict with existing or planned land uses or recreation areas inventoried along the proposed route. The proposed route would be constructed parallel to the existing Arizona Electric Power Cooperative, Inc.'s (AEPCO) 230kV transmission line and utilize existing access for the majority of its length (90 percent). All construction vehicle movement outside of the right-of-way will be restricted to existing access where practical. Fences or gates, if damaged or destroyed by construction activities, will be repaired or replaced to their original condition as required by the landowner or the land-management agency (see the BLM EA [Exhibit B-2, Appendix B] for a description of mitigation measures).

EXHIBIT B-1
FONSI AND DECISION RECORD

**USDI, BUREAU OF LAND MANAGEMENT
SAFFORD FIELD OFFICE
DECISION RECORD**

Morenci Water & Electric Company 345kV Intertie Project
Right-of-Way Serial No. AZA 30869
EA-AZ-040-99-11

Decision: This Decision Record approves the requested right-of-way, identified as the **proposed route** in the above-referenced environmental assessment (EA) for the Morenci Water & Electric Company (MW&E) 345 kilovolt (kV) Intertie Project along with recognized spur roads and construction yards.

Rationale: The proposed action has been analyzed, with no anticipated significant impacts on the human environment. The proposed action will utilize existing access for approximately 90 percent of its overall length, which will minimize environmental impacts. The construction of five spur roads and two temporary construction yards will be required, but is not expected to significantly effect environmental resources. At the close of construction, the construction yards and any spur roads not needed for long term maintenance will be reclaimed and permanently closed. The EA addresses potential effects the proposed action would likely have to environmental resources. The proposed action will not result in any undue or unnecessary environmental degradation or substantial commitment of natural resources and is in conformance with the Safford Field Office Resource Management Plan (RMP) (1991, as amended 1994). Page 22 of the RMP states, "Rights-of-way, leases, and permits will be considered on a case-by-case basis".

Further, the BLM has provided a no effect determination on biological resources inventoried along the proposed route (Biological Evaluation on threatened and endangered species and their habitats [Arizona Hedgehog Cactus and the Loach Minnow]).

Throughout the NEPA process, eight Native American Tribes were consulted. No significant issues or concerns were identified as a result of these efforts.

At the close of the EA comment period (Aug. 23, 1999), one written comment was received. Attached is a table containing BLM's response to comments.

Finally, the EA accomplishes the following:

- Complies with NEPA.
- Considers and carefully evaluates a range of reasonable alternatives.
- Adequately addresses the effectiveness of mitigation measures.
- Adequately accounts for the environmental impacts of the proposed action together with other reasonable foreseeable projects. As stated in the EA, Phelps Dodge Morenci, Inc. (PDMI) will continue to modify operations in mining production methods. Accordingly, PDMI will continue to modify and operate their distribution system on their private lands. (please see attached Figure MW&E-1).

I have reviewed this environmental assessment including the explanation and resolution of any potentially significant impacts. I have determined that this proposed action with the mitigation described below will not have any significant impacts on the human environment and that an EIS is not required. I have determined that this proposed action is in conformance with the approved land use plan. It is my decision to implement the action with the mitigation measures identified below.

Mitigation Measures:

1. Any cultural or paleontological resource (historic or prehistoric site or object) discovered by the applicant, or any person working on his behalf, on Federal land shall be immediately reported to the authorized officer. The applicant shall suspend all operations in the area of the discovery until authorization to proceed is issued by the authorized officer.
2. All known National Register eligible cultural sites located on Federal land will be avoided by all construction and access activities.
3. Construction yards and any spur road not needed for long term maintenance will be permanently closed and reclaimed to the satisfaction of the authorized officer.
4. Mitigation measures listed in the EA, Appendix B, Tables B-1 and B-2, will be included as part of the terms of the right-of-way grant.

W. King Program Manager
Authorized Official

December 3, 1999
Date

EXHIBIT B-2
BLM ENVIRONMENTAL ASSESSMENT
(ATTACHED UNDER SEPARATE COVER)

EXHIBIT C - AREAS OF BIOLOGICAL WEALTH

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 effects, if any, the proposed facilities will have thereon.”

BIOLOGICAL WEALTH

Introduction

The proposed route traverses relatively homogenous wildlife habitats and biological resources. Please see Table C-1 for a list of special status species. The exception to this is along the San Francisco River. The San Francisco River is a perennial stream that supports aquatic species. The associated riparian habitat supports a wider diversity of plant and animal species than the surrounding habitats.

Vegetation

Vegetation types were generally ranked as having low sensitivity with the exception of wash vegetation and riparian habitat. Xeroriparian habitat was ranked as having moderate sensitivity and riparian habitat as having high sensitivity. Riparian and aquatic habitats associated with the San Francisco River are unique throughout the study area. The proposed transmission line will span these habitats; therefore, there will be no long-term loss of such habitats resulting from the presence of the transmission line.

The U.S. Fish and Wildlife Service identified one endangered plant species as potentially occurring in the study area. Potential habitat for the Arizona hedgehog cactus (*Echinocereus triglochidiatus* var. *arizonicus*) is present on the cliffs adjacent to the San Francisco River. A survey was conducted for this species on April 23, 1999 and no occurrences of this cactus were located.

There are several plant species in the study area, which are under the protection of the Arizona Native Plant Law. An Arizona Native Plant Survey was conducted and plant types identified included mesquite, yucca, hedgehog cactus, ocotillo, and barrel cactus. This survey is currently being reviewed by the Arizona Department of Agriculture.

**TABLE C-1
SPECIAL STATUS SPECIES**

Key:

Federal Status
E = Endangered
T = Threatened
C = Candidate
BLMS = BLM Sensitive

State Status - Wildlife
WC -- Wildlife of Special Concern in Arizona

State Status - Plant
ANPL = Arizona Native Plant Law
sr = salvage restricted

Common Name	Species	Scientific Name	Habitat Type	Status		Occurrence Known or Potential
				Federal	State	
BIRDS						
American Peregrine Falcon		<i>Falco peregrinus anatum</i>	variety, steep area with cliffs near water	E		low potential for foraging, no nest sites; primarily migratory
Cactus Ferruginous Pygmy-owl		<i>Glaucidium brasilianum cactorum</i>	riparian habitats in desert scrub	E		low to no potential, east of known historic range
Southwestern Willow Flycatcher		<i>Empidonax trailii extimus</i>	riparian	E		low to no potential, limited riparian habitat along San Francisco; no critical habitat in the project area
Mexican Spotted Owl		<i>Strix occidentalis lucida</i>	forested canyons	T		no suitable habitat
Common Black-hawk		<i>Buteo galus anthracinus</i>	riparian habitat along perennial streams		WC	
AMPHIBIANS						
Chiricahua Leopard Frog		<i>Rana chiricahuensis</i>	found mainly in rocky areas within permanent streams	C		low potential
FISH						
Apache Trout		<i>Onchorhynchus apache</i>	cold, mountain streams	T		no potential, no habitat
Loach Minnow		<i>Tatiroga cobitis</i>	perennial streams with swift shallow water and gravel bottom	T		no potential, known habitat is northwest of the project area
Razorback Sucker		<i>Xyrauchen texanus</i>	streams and rivers with slow backwater areas and eddies	E		no potential, no critical habitat in the project area
Spinedace		<i>Meda fulgida</i>	moderate-fast flowing perennial streams with gravel substrates	T		no potential, no critical habitat within the project area
Gila Chub		<i>Gila intermedia</i>	pools, springs, cienegas, and streams	C		no potential, known range not within project area
PLANTS						
Arizona Hedgehog Cactus		<i>Echinocereus triglochidiatus arizonicus</i>	Oak woodland/chaparral to desert scrub habitats	E		low to moderate potential for occurrence adjacent to San Francisco River
San Carlos Buckwheat		<i>Eriogonum capitulare</i>	Grasslands, 2,000 to 3,000 feet elevation		ANPL sr	low potential

Wildlife

There are no special status wildlife species within the study area. The San Francisco River is historical habitat for the loach minnow; however, surveys conducted by the Bureau of Land Management in the summer of 1999 did not locate any loach minnows in the study area. Riparian habitat along the San Francisco River is not developed enough to support southwestern willow flycatchers and no known occurrences of this species exist at this crossing. No effects to any special status species will occur.

The riparian and aquatic habitats associated with the San Francisco River attract a wide variety of wildlife species. Birds and mammals may avoid the area during construction, but will continue to utilize the area following completion of the project.

Effects

No long-term, adverse effects to special status species or unique habitats will result from construction of the proposed route. The San Francisco River will be spanned by the transmission line and no long-term loss of habitat will occur except at structure sites and along spur roads. Erosion control measures will be implemented to prevent increased sedimentation from occurring in the river. In other areas, existing roads will be used for access whenever possible to reduce the loss of vegetation.

EXHIBIT D - BIOLOGICAL RESOURCES

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."

INTRODUCTION

Biotic resource inventory studies were conducted for the proposed project. 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 mapped during an initial field review. Additional native plant studies and surveys for an endangered species of cactus and fish were conducted. Dames & Moore and the Bureau of Land Management (BLM) personnel conducted these studies during the spring and summer of 1999.

INVENTORY

Vegetation Types

The majority of the study area is characterized by the semi-desert grasslands community. A narrow band of semi-desertscrub extends northwest to the southeast through Clifton and Morenci. At the lower elevation within the study area, plant species associated with Chihuahuan desertscrub are present. North of the study area, as elevations increase, species of the Madrean woodland occur. Perennial grasses and scrubby species generally characterize the landscape within semi-desert grasslands. The study area does not support a high diversity of native grasses due to grazing and other land use practices. Vegetation is relatively homogeneous, characterized primarily by tobosa grass, red brome, and snakeweed. Mesquite and creosote bush are locally common. Yuccas and cacti are sparse throughout the study area.

The San Francisco River is a perennial waterway located in the western portion of the study area. It supports a moderately well-developed riparian habitat including cottonwood, willow, and tamarisk. Xeroriparian habitats that occur along large intermittent washes are characterized by dense multi-leveled vegetation communities. The washes are generally wide and braided and several are within deeper, rocky canyons. Vegetation within and along these drainages is denser and includes paloverde, desert broom, catclaw, mesquite, burrobush, and rabbitbrush.

Wildlife

Semi-desert grassland communities support a wide variety of wildlife species. Large mammals include coyote, bobcat, and mule deer. Smaller mammals in the study area are black-tailed jackrabbit; several species of pocket mice, kangaroo rats, and ground squirrels; and badger. Typical bird species include Swainson's hawk, prairie falcon, kestrel, horned lark, Say's phoebe, Chihuahuan raven, loggerhead shrike, and lark sparrow. Amphibian and reptile species include the western green toad and southwestern earless lizard.

Wildlife, particularly birds, is more common along drainages where xeroriparian habitats provide greater opportunities for nesting and feeding. Larger wildlife, including mule deer, coyote, and bobcat, use these washes as travel corridors. The San Francisco River supports riparian habitat. Riparian habitat is well-recognized for its inherent high productivity and value to wildlife. A disproportionate number of wildlife and plants are associated with riparian habitats. The San Francisco River is a perennial stream, which provides aquatic habitat for numerous fish species. Amphibians are likely to be found along the edges of the water where the water flow is slower. Other wildlife species that use this important source of water include deer, rabbits, coyotes, ground squirrels, quail, doves, black-tailed gnatcatcher, Say's phoebe, and mourning dove.

EFFECTS

Potential impacts to biological resources associated with the proposed project are related to activities likely to occur during the construction, operation, and maintenance of the transmission line. The impact levels were determined to be low to moderate, based on the inventory of the resources present, sensitivity and anticipated level of disturbance to those resources, and effectiveness of applied mitigation. Biological resources included in the impact assessment were vegetation types, special status plant, and wildlife species.

Vegetation

Vegetation types were generally ranked as having low sensitivity with the exception of wash vegetation and riparian habitat. Xeroriparian habitat was ranked as having moderate sensitivity and riparian habitat as having high sensitivity. No occurrences of special status species are known within the study area. A Biological Evaluation, which documents impacts to potential habitat for such species, is attached as Exhibit D-1.

Impacts of the proposed project include ground disturbance and increased human access. Ground disturbance occurring during construction of the transmission line would result from upgrading or building access and spur roads, placing structure footings, and wire pulling sites. Permanent loss of habitat would be restricted to structure placement sites and along new spur roads. There could be short-term loss of vegetation due to trampling and soil compaction in the immediate vicinity of construction areas.

Xeroriparian habitats, which occur along dry washes throughout the study area, provide shelter for numerous desert and grassland species. Most of these washes are narrow and can be easily spanned by the conductors, reducing the potential for loss of xeroriparian habitat. Riparian habitat exists along the San Francisco River. There would be no loss of such habitat, as the transmission lines will span the river and the structures will be placed high above and outside the river corridor.

Revegetation of construction yards after project implementation will occur. The seed mix used to complete the revegetation will be approved by BLM and the Arizona Department of Agriculture.

Wildlife

Increased noise and activity levels during construction of the proposed route 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. There could also be a loss of burrows and nests for ground-dwelling species. Big game species, including mule deer and javelina, utilize open washes as movement corridors throughout the study area. The transmission line would not constitute a barrier to wildlife movement after construction and habitat fragmentation would not occur.

EXHIBIT D-1
BIOLOGICAL EVALUATION



DAMES & MOORE

A DAMES & MOORE GROUP COMPANY

July 8, 1999

Mr. Jim Gacey, Wildlife Biologist
Bureau of Land Management-Safford District
711 14th Avenue
Safford, AZ 85546

RECEIVED
JUL 09 1999
BLM SAFFORD FIELD OFFICE
SAFFORD, ARIZONA

Cambric Corporate Center
1790 East River Road, Suite E-300
Tucson, Arizona 85718-5876
520 529 1141 Tel
520 529 2449 Fax

RE: Biological Evaluation – Greenlee to Morenci 345k Transmission Line Project
D&M Job 00136-113-050

Dear Mr. Gacey,

Enclosed is the final Biological Evaluation (BE) for the Greenlee to Morenci 345kV Transmission Line Project. Your comments on the draft have been incorporated; specifically, we have added a discussion on the loach minnow. Please review the document. I have included two signature pages in this packet. One is for your copy of the report. Please sign and return the other page for our files.

Please feel free to call me at 520-529-1141 if you have any questions concerning this document.

Sincerely,

Dames & Moore

Kimberly A. Otero
Project Biologist

KAO/nlc

Enclosure

FINAL
BIOLOGICAL EVALUATION FOR THE
PROPOSED MORENCI WATER & ELECTRIC
345 kV INTERTIE PROJECT

SAFFORD DISTRICT
BUREAU OF LAND MANAGEMENT
ARIZONA

Submitted as
Exhibit D of the Environmental Assessment

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1.0 PROJECT LOCATION

The project is located in Greenlee County in southeastern Arizona. The proposed and alternative routes fall on the Guthrie, Clifton, Rattlesnake Spring, and York, Arizona 7½ minute topographic quadrangles. A map of the study area depicting the proposed route is shown on Exhibit A-1.

The majority of the study area is characterized by the semi-desert grasslands community (Brown 1982). A narrow band of the semi-desert grasslands community extends from the northwest to the southeast through Clifton and Morenci. Perennial grasses and scrubby species generally characterize the landscape within semi-desert grasslands. The study area does not support a high diversity of native grasses due to grazing and other land use practices. Vegetation is relatively homogeneous, characterized primarily by tobosa grass (*Hilaria mutica*), red brome (*Bromus rubens*), and snakeweed (*Gutierrezia sarothrae*). Mesquite (*Prosopis velutina*) and creosotebush (*Larrea tridentata*) are locally common. Yuccas (*Yucca elata*) and cacti are sparse throughout the area. Plant species associated with Chihuahuan desertscrub are present at the lower elevational limits on the southern boundary of the project area. As elevations increase at the north end of the study area, species of the Madrean woodland occur.

Riparian habitat is limited and moderately well developed in the study area along the San Francisco River. Vegetation components of this community include cottonwood (*Populus* sp.), willow (*Salix nigra*), salt cedar (*Tamarix chinensis*), seepwillow (*Baccharis glutinosa*) and mesquite. The proposed route crosses the San Francisco River, which is a perennial stream, south of the town of Morenci.

Xeroriparian habitats occur primarily along the larger intermittent washes, which drain the project area. These drainages support denser, multi-leveled vegetation communities, which are denser than adjacent upland areas. Common vegetation to these drainages include mesquite and a variety of other shrubby species such as catclaw (*Acacia greggii*), white-thorn (*A. constricta*), burrobrush (*Hymenoclea* sp.), and desert broom (*Baccharis sarothroides*).

2.0 PROJECT DESCRIPTION

Morenci Water and Electric Company (MW&E) has requested a right-of-way grant (SF 299) from the Bureau of Land Management (BLM) for the construction, operation, and maintenance of a 345 kilovolt (kV) transmission line from the Tucson Electric Power (TEP) Greenlee Substation east of Clifton, Arizona to the proposed Copper Verde Substation that would be located south of Morenci (see Figure 3 in Chapter 2 of the EA). An in-service operating date of 2000 has been proposed for the 345kV intertie project.

2.1 PURPOSE OF THE PROJECT

MW&E serves electricity to its customers in the Morenci and Clifton areas, including PDMI. To supply its customers with electricity, MW&E purchases power from electricity suppliers within the western United States, including the Arizona Electric Power Cooperative, Inc. (AEPCO). The power purchases are delivered to MW&E customers using the extra-high voltage interconnected transmission grid, the AEPCO transmission system, and a single 230kV transmission line connecting AEPCO's transmission system to MW&E.

MW&E is proposing the 345kV intertie project as a reinforcement for the existing AEPCO transmission system to meet the need for both increased load serving capability and increased reliability. Over the last several years the electrical load for MW&E customers has grown from 170 megawatts (MW) in 1993 to the current 220 MW. This increase in electrical load is based in part on the shift of PDMI's mining production methods. These methods are more sensitive to power outages than in the past. Increasing the reliability of the transmission system is necessary to minimize the loss of costly downtime in mining production that results from a power outage. AEPCO currently provides 135 MW to MW&E through firm (or non-interruptible) power contracts and 85 MW (from 135 MW to 220 MW) to MW&E through non-firm (or interruptible) power contracts.

The proposed action would accomplish the following:

- provide the additional 85 MW (from 135 MW to 220 MW) of firm transmission capability needed to satisfy MW&E's current electrical load
- reinforce the transmission delivery system to provide reliable and increased load serving capability to support continuing load growth at PDMI
- increase the reliability of the MW&E electrical system by creating a looped transmission system to provide a second transmission path to supply MW&E customers with power during system outages
- provide supplemental access to the western United States' interconnected electrical grid to allow MW&E to purchase power and optimize the terms of its power purchase agreements

- provide for de-energized maintenance of the existing AEPCO 230kV facilities, resulting in additional operating flexibility, increased maintenance efficiency, lower overall operating costs, and enhanced worker safety

- provide for compliance with Western Systems Coordinating Council reliability criteria with regard to single contingency outages and maintenance of service to customers during system outages

3.0 CURRENT MANAGEMENT DIRECTION

The Endangered Species Act of 1973 (PL 93-205, as amended) requires federal agencies to ensure that any activities they authorize, fund, or carry out do not jeopardize the continued existence of any species federally listed as threatened or endangered, or result in the adverse modification of any species' habitat. Federal agencies shall confer with the Secretary of the Interior, through the U.S. Fish & Wildlife Service (USFWS), if any action is likely to jeopardize the continued existence of a species listed or proposed for listing or adversely modify its designated or proposed critical habitat. BLM requires that a Biological Evaluation be completed to determine the effects of the proposed action on listed species. If a finding of "no effect" results, then no further consultation is necessary.

This document fulfills the BLM requirement for completion of a Biological Evaluation.

4.0 SPECIES IDENTIFICATION

A list of threatened and endangered species for Greenlee County was obtained from the USFWS (1999). Table D-1 presents those special status species listed by the USFWS as occurring in Greenlee County and identifies if habitat for such species is present with the study area. Of those listed, habitat for the Arizona hedgehog cactus is present (Robles, personal communication, 1999). The loach minnow was found in the San Francisco River historically and this perennial stream is still considered potential habitat for this species (Gacey, personal communication, 1999).

**TABLE D-1
SPECIAL STATUS SPECIES**

**Determination of Special Status Species Likely to Occur in the
Habitats Traversed by the Proposed or Alternative Routes
for the MW&E 345kV Intertie Project**

**Key to Federal Status:
E=Endangered T=Threatened C=Candidate for Listing**

Species		Status	Habitat Present	
Common Name	Scientific Name	Federal	Yes	No
Birds				
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	E		X
Cactus Ferruginous Pygmy-owl	<i>Glaucidium brasilianum cactorum</i>	E		X
Southwestern Willow Flycatcher	<i>Empidonax traillii extimis</i>	E		X
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	T		X
Amphibians				
Chiricahua Leopard Frog	<i>Rana chiricahuensis</i>	C		X
Fish				
Apache Trout	<i>Onchorhynchus apache</i>	T		X
Loach Minnow	<i>Tairoga cobitis</i>	T	X	h*
Razorback Sucker	<i>Xyrauchen texanus</i>	E		X
Spikedace	<i>Meda fulgida</i>	T		h*
Gila Chub	<i>Gila intermedia</i>	C		X
Plants				
Arizona Hedgehog Cactus	<i>Echinocereus triglochidiatus arizonicus</i>		X	
h* = historical				

4.1 ARIZONA HEDGEHOG CACTUS

4.1.1 Affected Environment

The rocky slopes with granite outcroppings adjacent to the San Francisco River provide potential habitat for the Arizona hedgehog cactus.

4.1.2 Species Biology

The Arizona hedgehog cactus is a robust variety of hedgehog cactus, generally consisting of one to several stems growing in open clumps (Benson 1982; Earle 1986). The stems are generally 8 to 14 inches tall and 2 to 2.5 inches in diameter. The central spines are long and gray measuring approximately 1 to 1.5 inches in length. There are 8 to 10 radial spines that are light yellow and measure approximately 0.5-inch in length. Scarlet flowers appear in May and measure approximately 1.5 to 2 inches in diameter. Light red, spiny fruit containing black seeds follow the flowering season.

4.1.3 Current Condition

Rangewide: The Arizona hedgehog cactus is found from the Superior-Globe, Arizona region, southwest to New Mexico, then south into Mexico. It generally grows at elevations between 3,500 to 4,800 feet in chaparral and oak trees down to grasslands. It is often associated with gentle slopes having granite outcroppings. The limited known distribution of this plant indicates that it is vulnerable to threats from activities causing ground disturbance or loss of individual plants. This includes mining, illegal collecting, off-road vehicle use, and road and utility line construction.

Action Area: This cactus is currently under taxonomic review to determine the classification of individuals found in eastern Arizona. Until this determination is made, BLM is considering that these individuals be protected under the Endangered Species Act (Robles, Personal Communication, March 2, 1999). Potential habitat exists on the hillsides adjacent to the San Francisco River. A field survey of this area conducted in April 1999 did not locate any Arizona hedgehog cactus along the proposed route or at proposed tower sites adjacent to the San Francisco River.

Cumulative Effects: The proposed action will not result in the cumulative loss of this species. Minimal permanent habitat loss will occur at the structure sites.

Other Consultations in the Area: The BLM has consulted with the USFWS on this species during the completion of grazing permits.

4.1.4 Critical Habitat

No critical habitat has been designated for the Arizona hedgehog cactus.

4.1.5 Effects of the Proposed Action

The proposed action will result in ground disturbance during the construction of the line and placement of the structures. There will be no loss of individual cacti since none are present. There will be a permanent loss of habitat at the tower sites; however, the tower sites themselves support marginal habitat for the cactus.

4.1.6 Conservation Measures

Mitigation measures that will be implemented as part of the proposed action area designed to reduce the effects of ground disturbing activities. A comprehensive mitigation list is described in Appendix B of the EA. These measures will help conserve potential habitat for this cactus.

4.1.7 Effects Determination

The proposed action will have no effect on the Arizona hedgehog cactus or its habitat.

4.2 LOACH MINNOW

4.2.1 Affected Environment

The San Francisco River is the affected environment for this species.

4.2.2 Species Biology

The loach minnow is a small, slender, elongated fish less than three inches in length, with upward-directed eyes (59 FR 10898). It is a highly specialized fish that is restricted to gravelly riffles in small to moderately large creeks and rivers. It is usually found in beds of filamentous algae in the main channels of shallow, swift reaches or along the edges of more torrential rapids (Minckley 1973).

The habitat requirements of the loach minnow are very limiting because they need to be in riffle areas intermediate between the shore (slowest velocity) and the center of the stream (fastest velocity). They are highly specialized riffle dwellers and can survive seasonal fluctuations in stream discharge due to prolonged droughts and severe floods. These catastrophic events can alternately inundate and expose riffles as well as shift, eliminate, and create riffles. Although

these minnows persist under the harsh conditions of desert streams, they are not so adept in streams altered by humans (Propst and Bestgen 1991).

The loach minnow spawns in late winter and early spring (Minckley 1973). Propst and Bestgen (1991) completed a study on loach minnow in New Mexico. They found that the females deposit adhesive ova in a single layer on the undersides of flat rocks that were slightly elevated from the stream bed on the downstream side. The rocks were almost always fine-grained, basalt material with smooth surfaces. The rocks were usually in riffles where the interstitial spaces were free of fine sediments. Clutches in shallow, slow-moving water developed fungal infections. Flowing water is very important to embryo viability. According to Minckley (1973), a female develops only one complement of eggs each year. The first spawn occurs in the second summer of life, and few (if any) live through their fourth summer. They grow throughout the year, but grow faster during the summer.

Loach minnows are exclusively insectivorous. However, their diet consists of different orders and families of insects as the minnows pass through different life stages and different seasons (Minckley 1973, Propst and Bestgen 1991). Loach minnows are bottom dwellers. They are heavier than water and sink quickly, so they have to swim vigorously to stay afloat. They support themselves with their pectoral fins on the substrate and raise their heads to examine floating debris. They swim with exaggerated lateral body movements in short bursts (Minckley 1973).

4.2.3 Current Conditions

Rangewide: The loach minnow was once found in streams throughout the Gila River system (AGFD 1988). It was also common in the Verde, Salt, San Pedro, and San Francisco River systems. Today only scattered populations exist throughout Arizona and New Mexico (59 FR 10898).

Action Area: In Arizona, the loach minnow can be found in Aravaipa Creek between Graham and Pinal counties. Historically, the loach minnow was found within the project area. Today, however, it is restricted to the San Francisco River, upstream from the area of concern, in New Mexico (Propst and Bestgen 1991). Surveys conducted by BLM biologists on June 15-16, 1999 did not locate the loach minnow in the San Francisco River from the mouth of the river to the boundary of the BLM with the U.S. Forest Service (Gacey, personal communication 1999). This survey encompassed the study area.

Cumulative Effects: Habitat loss is a major contributor to the decline of the species (Minckley 1973). Human activities often result in negative impacts to the loach minnow. When streamflows are diverted for activities such as agriculture, the riffle habitats are lost first. Reestablishment is increasingly difficult the more often riffle habitats are lost (Propst and Bestgen 1991).

The introduction of non-native fish, in particular, the red shiner (*Notropis lutrensis*), has had a detrimental effect on loach minnow populations (Minckley and Deacon 1968). Competition and predation are both factors in the interactions between the loach minnows and the introduced

species. There is only one potential native fish predator, *Gila robusta*, which is a pool-dweller, and therefore unlikely to have regular contact with loach minnows (Propst and Bestgen 1991).

Other Consultations in the Area: No other consultations are known to have occurred in this area to date.

4.2.4 Critical Habitat

The loach minnow was listed as a threatened species under the Endangered Species Act of 1973 on October 28, 1986 (51 FR 39468). On March 8, 1994, 159 miles of critical habitat were designated along various rivers and creeks in Arizona and New Mexico (59 FR 10898). Designated critical habitat for the loach minnow is not located within the study area (59 FR 10898).

4.2.5 Effects of the Proposed Action

Construction of the proposed action will not result in the loss or degradation of habitat for the loach minnow. In order to string the conductor across the San Francisco River, a pick-up truck, equipped with a light line, will be driven along an existing two-track road west of the existing AEPCO right-of-way from the spanning structure on the south side of the river, crossing through the San Francisco River at the ford to the spanning structure on the north side of the river. The light line will then be tied to a conductor and pulled through the spanning structures on the south and north sides of the San Francisco River. This process will be repeated until all conductors (6) and static wires (2) are pulled through the spanning structures. Approximately 16 trips will be required through the river at the existing ford, constituting a short-term effect on the area of the crossing. This will not result in degradation of the aquatic system and no long-term adverse effects will be realized. All other construction activity will occur out of the aquatic and riparian habitat and no structures will be placed within the river corridor.

4.2.6 Conservation Measures

Best management practices will be implemented to control erosion in the construction area in order to prevent sedimentation in the river. Vehicular traffic through the river will be limited to pick-up trucks crossing between the transmission tower sites to string conductors and static wires. Mitigation measures required by the Army Corps of Engineers as part of the 404 Permit will also reduce any effects to the aquatic environment.

4.2.7 Effects Determination

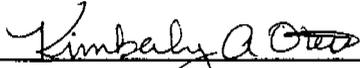
The proposed action will have no effect on the loach minnow or its habitat. This species is not known to occur in the study area, and there is no designated critical habitat within the study area.

5.0 CONTACTS MADE

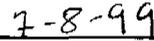
Bureau of Land Management – Safford District
Ben Robles, Resource Manager
Jim Gacey, Wildlife Biologist

6.0 SIGNATURE PAGE

I prepared this Biological Evaluation.

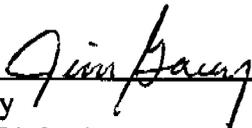


Kimberly A. Otero
Project Biologist
Dames & Moore

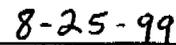


Date

I reviewed this Biological Evaluation and concur with the findings.



Jim Gacey
Wildlife Biologist
Bureau of Land Management – Safford Field Office



Date

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EXHIBIT E - SCENIC AREAS, HISTORIC SITES AND STRUCTURES OR ARCHAEOLOGICAL SITES

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

"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 effects the proposed action may have on each resource. For further information refer to the Bureau of Land Management (BLM) Environmental Assessment (Exhibit B-2).

SCENIC AREAS AND VISUAL RESOURCES

The visual resource study addressed the inherent aesthetics of the landscape, public value of viewing the landscape, and sensitivity to visual effects from the proposed route. The visual analysis was conducted in compliance with the BLM Visual Resource Management (BLM Manual 8410-1, January 1986) system. The visual inventory included an evaluation of the existing visual conditions, scenic quality, visual sensitivity, and agency visual management objectives. A 4-mile-wide corridor (2 miles on either side of the assumed centerline) was inventoried.

There are no predicted high visual impacts resulting from the proposed project. Visual impacts associated with the construction and operation of the transmission line are expected to be long term, remaining over the life of the project. Visual impacts for this project were low to moderate based on the following considerations: (1) the proposed transmission line would parallel the Arizona Electric Power Corporation, Inc.'s (AEPCO's) existing 230 kilovolt (kV) transmission line for approximately 90 percent of its length; (2) existing access would be used for construction to the extent practical (approximately 90 percent); (3) similar structure type (H-frames) would be used and sited adjacent to AEPCO's structures; and (4) nonspecular conductors would be used. In addition, specific tower siting combined with the application of mitigation would result in overall residual visual impact levels that are expected to be lower than those typically associated with a 345kV transmission line.

The study area is located within the Datil physiographic province in southeastern Arizona (*Landscape Character Types of the National Forests in Arizona and New Mexico* 1989). The topographic character within the central and southern portions of the study area can be described as flat to gently sloping hills dissected by riparian tributaries. Along the San Francisco River and within the Gila Box Riparian National Conservation Area, the topographic character is distinctively varied with 100-foot sheer cliffs and riparian canyons. The northwestern portion of the study area around the Morenci Mine shows evidence of high topographic modifications as a result of more than a century of mining activity. The topographic character around the town of Clifton is visually interesting with auburn cliffs resulting from the presence of the San Francisco volcanic fault line.

The vegetation character of the study area includes desertscrub grasslands (scrub mesquite, creosote bush, yucca, ocotillo, and grass and cacti species) with some riparian areas (willows, cottonwoods, and tamarisk) meandering north/northeast to southwest along the San Francisco River and other riparian areas.

Cultural modifications in the study area include the communities of Morenci, Clifton, Loma Linda, Verde Lee, and Three Way. Other modifications include major travel routes such as US 191, State Route (SR) 75 and SR 78. The Morenci Mine footprint occupies the majority of the northwestern and western portions of the study area. Substations that occur in the study area include Tucson Electric Power (TEP) Greenlee, AEPCO Greenlee, and AEPCO Morenci. Numerous telephone and 12kV distribution lines, 230kV and 345kV transmissions lines, and natural gas pipelines occur within the study area.

Scenic Quality

The elements of scenic quality include the character and diversity of form, line, color, texture, and cultural or man-made features. These features become the basis for separating the study area into units, which identify the relative scenic value of a landscape. These units are scenic quality Class A (lands of outstanding or distinctive diversity or interest), scenic quality Class B (lands of common or average diversity or interest), or scenic quality Class C (lands of minimal diversity or interest), with A representing the highest and C the lowest scenic quality value.

Class A landscapes (3 percent) within the study area are associated with riparian areas along the San Francisco River. Class B landscapes (11 percent) are associated with rolling hills of desertscrub grasslands, and riparian tributaries. Class C landscapes (86 percent) are associated with flat to gently sloping desertscrub grasslands, which includes the majority of lands inventoried in the study area.

Impacts to scenic quality indicate the change in scenic value of the landscape with the introduction of the proposed project. Impacts to scenic quality in the study area would be low because (1) the predominance of landscapes with minimal or average scenic quality; (2) the presence of existing linear facilities (e.g., transmission lines, railroads, highways, and an access road for 90 percent of the proposed route); and/or (3) the implementation of the following mitigation measures—nonspecular conductors and matching existing structure types.

Sensitive Viewpoints

The sensitivity of a viewpoint reflects the degree of public concern for change in the scenic quality of the landscape visible from that location. Sensitivity is measured by evaluating the type of viewpoint and viewer concern for change in the landscape, volume of use, viewing duration, public and agency management concerns, and influence of adjacent land use. Sensitive viewpoints that were identified within the study area included residences, major travel routes, and recreation areas. The following sections provide a more detailed description of the potential visual impacts to sensitive viewpoints along the proposed route.

Residences - Residences are considered high sensitivity viewpoints since their occupants have a high concern for change in the landscape and have long-term viewing conditions. As stated in the above paragraph, approximately 90 percent of the proposed route would parallel the existing AEPCO 230kV transmission line resulting in low impacts to middleground residential viewers situated in Verde Lee, Loma Linda, and Morenci. The closest resident is approximately 0.5 mile from the proposed project.

Travel Routes - Low impacts to viewers within foreground views using travel routes (US 191 and SR 78) would result from the proposed project.

Other Sensitive Viewpoints - Low impacts to viewers from within the San Francisco River corridor (portions of Link R1) would result from the proposed project. A majority of Link R1 is not visible from within the corridor. Non-specular conductors would be visible from within the corridor. Upon final design of the transmission line, the Federal Aviation Administration may make a recommendation to install marker balls on portions of the conductors that cross the San Francisco River. The installation of marker balls are not expected to modify the setting significantly. Low impacts also would occur from foreground viewers along the Black Hills Back Country Byway (Link T4, 1.07 miles). At the crossing of the Byway, this route would parallel the existing AEPCO 230kV transmission line resulting in a weak project contrast.

Agency Management Objectives

The BLM uses the Visual Resource Management System that classifies landscapes into distinctive classes in an effort to manage visual resources on BLM administered lands. These classes are defined as I, II, III, and IV. Class I landscapes are afforded the highest level of sensitivity from man-made influences while Class IV landscapes are the most compatible. In the study area no Class I landscapes were inventoried. The proposed route crosses predominantly Class III and Class IV landscapes with intermittent Class II landscape occurring along the San Francisco River.

CULTURAL RESOURCES

Cultural resources typically are understood to include archaeological sites, buildings, structures, districts, and objects as those property types have been defined in the National Historic Preservation Act (NHPA), as amended. The NHPA and its implementing regulations provide direction for deciding whether cultural resources are of sufficient importance to be determined eligible for listing on the National Register of Historic Places (National Register). Cultural resources that are either listed on the National Register, or have been determined eligible for listing, are termed "historic properties" irrespective of whether they are prehistoric or historic in age. In the Southwest, the break between prehistory and history is understood to have occurred in the sixteenth century when written records were produced by Spanish explorers; however, it is recognized that Native American oral traditions also may provide accounts of earlier time periods. To be regarded as historic rather than modern, properties ordinarily must be at least 50 years old.

The area of potential effect is defined in regulations to implement the NHPA as “the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist” (36 CFR, Part 800.16). In this case, the area of potential effect includes the proposed Morenci Water & Electric Company (MW&E) right-of-way and associated access roads and construction easements where physical disturbance to cultural resources could occur, and areas up to ¼ mile from the proposed right-of-way where certain types of cultural resources might be negatively affected by visual intrusions from the new 345kV transmission line.

The cultural resources inventory was accomplished through (1) examination of existing records, (2) intensive pedestrian survey including inspection of known cultural resources that might be subject to visual effect beyond the proposed right-of-way, and (3) consultation with Native American groups that might value aspects of the study area. The Native American consultation, which included submission of project materials for review by the tribes with follow up telephone contacts, was directed by the BLM (refer to Exhibit J). Tribal governing officials and cultural preservation specialists from the following tribes were included in the consultation:

- Ak-Chin Indian Community
- Gila River Indian Community
- Hopi Tribe
- Salt River Pima-Maricopa Indian Community
- San Carlos Apache Tribe
- Tohono O’odham Nation
- White Mountain Apache Tribe
- Zuni Tribe

Access roads and temporary construction easements were identified and included in a cultural report sent to the Arizona State Land Department, BLM, and Arizona State Museum.

Historic Sites and Structures

To date the cultural resources inventory has identified seven historic archaeological sites and four historic structures (three roads and two railroads) within the proposed right-of-way (the roads and railroads extend beyond the right-of-way) and also examined a historic bridge within one-quarter-mile of the right-of-way (Table E-1).

**TABLE E-1
CULTURAL RESOURCES WITHIN THE AREA OF POTENTIAL EFFECT**

Designation	Description	Date	National Register Eligibility*	Jurisdiction
<i>Historic Archaeological Sites</i>				
AZ CC:3:7 (ASM)	trash dump	1880-1916	recommended not eligible	BLM
AZ CC:4:36 (ASM)	11 CCC erosion control features	1930s	recommended eligible (criterion A)	ASLD
AZ CC:4:37 (ASM)	13 CCC erosion control features	1930s	recommended eligible (criterion A)	ASLD
AZ CC:4:40 (ASM)	3 CCC erosion control features	1930s	recommended eligible (criterion A)	ASLD
AZ CC:4:41 (ASM)	1 CCC erosion control feature	1930s	recommended eligible (criterion A)	ASLD
AZ CC:4:42 (ASM)	1 CCC erosion control feature	1930s	recommended eligible (criterion A)	ASLD
AZ CC:4:43 (ASM)	2 CCC erosion control features	1930s	recommended eligible (criterion A)	ASLD
<i>Historic Structures</i>				
AZ CC:3:92 (ASM)	Old Safford-Clifton Road	?1910s -	recommended not eligible	BLM
AZ CC:3:91 (ASM)	US 191/666	?1939 -	recommended not eligible	BLM
AZ CC:4:25 (ASM)	AZ&NM Railroad	1883 - present	recommended potentially eligible (criteria A & D)	BLM
AZ CC:4 35 (ASM)	SR 78	?1923 -	recommended not eligible	ASLD
AZ W:15:54 (ASM)	Morenci Southern Railroad grade	1901-1922	recommended not eligible	BLM
ADOT Bridge #8150	Solomonville Overpass Bridge	1907	listed (criterion A)	BLM
ASLD = Arizona State Land Department CCC = Civilian Conservation Corps *Recommendations pertain to whether or not portions of properties within the area of potential effect contribute to overall significance.				

Eligibility criteria include A (association with important events), B (association with important people), C (artistic, architectural, or engineering merit), and D (data potential). For historic linear structures, recommendations pertain to segments within the area of potential effect. The cultural resources report recommends that site AZ CC:3:7 (ASM), a historic trash dump at which data recovery was accomplished in the 1970s, lacks sufficient integrity with regard to information potential to be regarded as eligible for National Register listing.

The report concluded that the six CCC-related archaeological sites retain sufficient integrity to be considered eligible for listing on the National Register under criterion A. These sites constitute physical evidence of conservation and erosion control techniques employed by CCC employees during the Great Depression, a significant and defining period in North American history. The CCC was just one of several "New Deal" policies designed to rescue the nation from the fledgling and

unstable economic conditions of the 1930s. These sites are evocative of the Depression and of the “New Deal” policies for combating massive unemployment and alleviating the soil erosion problem from which the Gila River valley suffered at that time. Because mapping efforts have realized the bulk of the sites’ information potential, they are recommended not to be regarded as eligible under criterion D.

The cultural report identified three roads—Old Safford-Clifton Road (AZ CC:3:92 [ASM]), US 666/191(AZ CC 3:91 [ASM]), and SR 78 (AZ CC 4:35 [ASM])—that have been substantially upgraded in the vicinity of the proposed route and thus lack integrity. In addition, it is unclear whether the segments of US 191 and SR 78 actually are associated with a significant historic context. For this reason it is recommended the segments of the three roads within the area of potential effect are not eligible for listing on the National Register.

Built as a narrow gauge railroad in the nineteenth century, the AZ & NM Railroad (AZ CC:4:25 [ASM]) is still in use and is associated with the theme “The Mining, Settlement, and Transportation History of Greenlee County.” The structure retains integrity of location, design, and association relative to its use as a standard gauge railroad from the turn of the century, but its integrity has been degraded with regard to setting and feeling within the area of potential effect. It has not been determined whether the structure retains integrity of workmanship and materials, and therefore recommended it be considered potentially eligible for listing under criteria A and D.

The Morenci Southern Railroad operated between 1901 and 1922 when it was abandoned. Today just the grade is in evidence for most of the route between Guthrie and Clifton. Within the area of potential effect, the structure retains little integrity and has no apparent data potential. Therefore, it is recommended not eligible for National Register listing.

The Solomonville Overpass Bridge (ADOT Bridge #8150) was listed on the National Register under criterion A in 1988 for its association with Arizona Territorial history. Site inspection demonstrated that today the bridge looks much as it did when it was listed. In 1988 the AEPCO transmission line could be seen from the bridge. The setting probably has been degraded further since that time by upgrading of the Old Safford-Clifton Road (now the Black Hills Back Country Byway), on which the bridge is located. Nonetheless, the bridge still retains sufficient integrity to maintain its eligibility.

Prehistoric Archaeological Sites

No prehistoric archaeological sites have been identified within the proposed MW&E right-of-way or along associated access roads.

Effects

Two of the archaeological sites recommended as eligible properties (sites AZ CC:4:37 and 40 [ASM]) are beyond the proposed MW&E right-of-way and thus will not be subject to physical

disturbance. Because their settings have already been altered, the cultural report concluded the new 345kV transmission line will not create an adverse visual intrusion.

The four additional archaeological sites recommended as eligible for National Register listing (sites AZ CC:4:36, 41, 42, and 43) and the AZ & NM Railroad, which is recommended as potentially eligible, will be spanned and physical disturbance will be avoided or minimized through (1) control of vehicular activities during construction; (2) ensuring access roads are not upgraded in the vicinity of the properties; and (3) requiring use only of approved access during maintenance of the line. Because their settings have already been altered, it was concluded the new 345kV transmission line will not create an adverse visual intrusion on any of these properties, nor will it materially effect the Solomonville Overpass Bridge. Effects to the properties recommended not eligible for National Register listing are not an issue, but all could be avoided.

In sum, a commitment by MW&E to the avoidance measures outlined above should result in a determination of "no effect to historic properties" in accordance with the newly adopted (17 June 1999) regulations to implement Section 106 of the National Historic Preservation Act. An intensive cultural pedestrian survey was conducted along the proposed route (150 feet wide), spur roads, and construction yards. This cultural report is currently being reviewed by BLM, State Historic Preservation Office, and Arizona State Museum.

References Cited

Cultural Resources Survey for the Morenci Water & Electric 345kV Intertie Project, Greenlee County, Arizona. Dames & Moore, Phoenix 1999.

EXHIBIT F - RECREATIONAL PURPOSES AND ASPECTS

As stipulated in the 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."

RECREATIONAL PURPOSES AND ASPECTS

There are no plans at present to designate the proposed right-of-way for public recreational purposes.

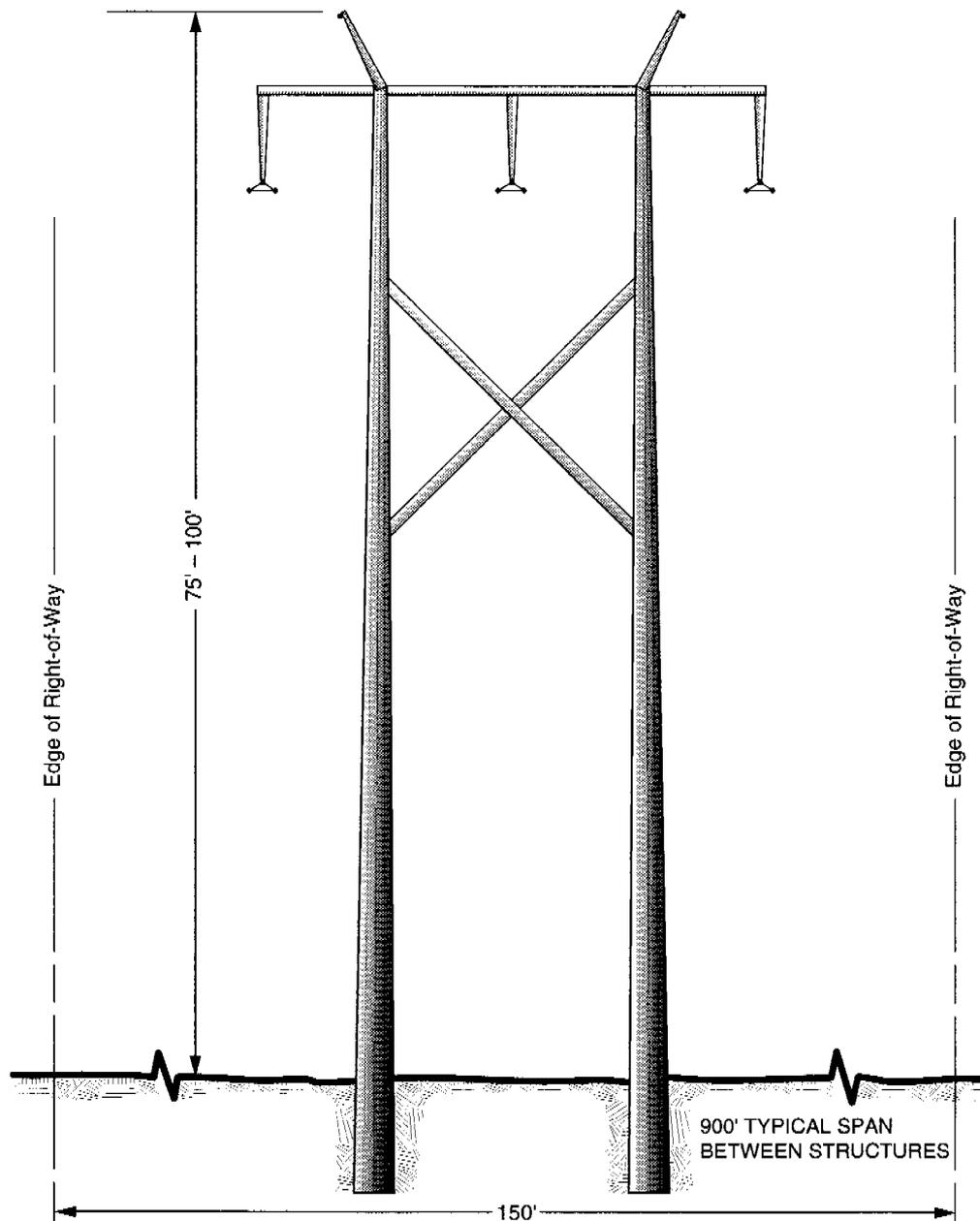
EXHIBIT G – CONCEPTS OF TYPICAL FACILITIES

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.”

CONCEPTS OF TYPICAL FACILITIES

- Exhibit G-1: Typical Single Circuit 345kV Structure
- Exhibit G-2: Typical Double Circuit 345kV Structure
- Exhibit G-3: Typical Substation

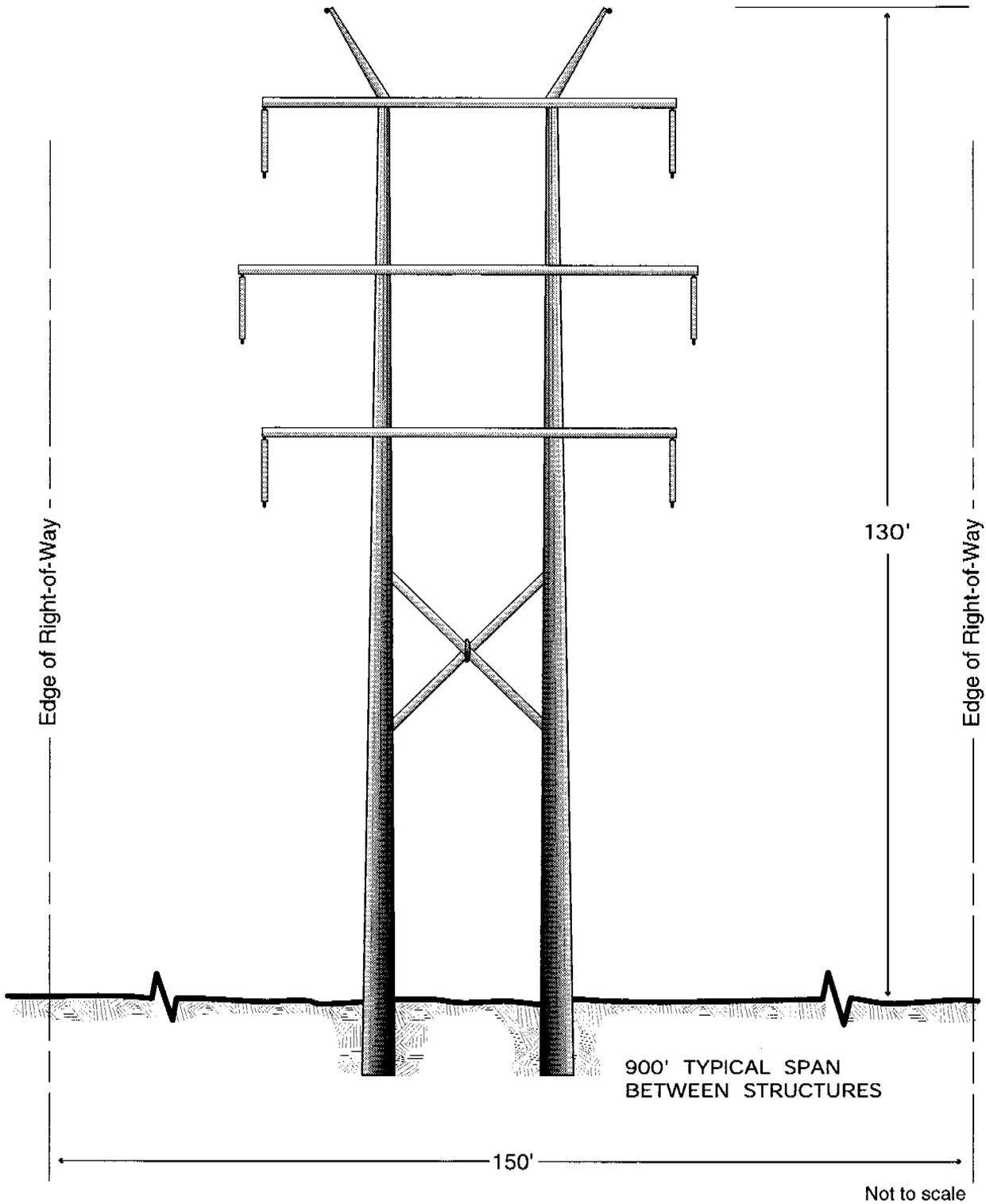


Not to scale

**Typical 345kV Single Circuit
Self-Weathering Steel Structure**
Morenci Water & Electric 345kV Intertie Project

October 1999

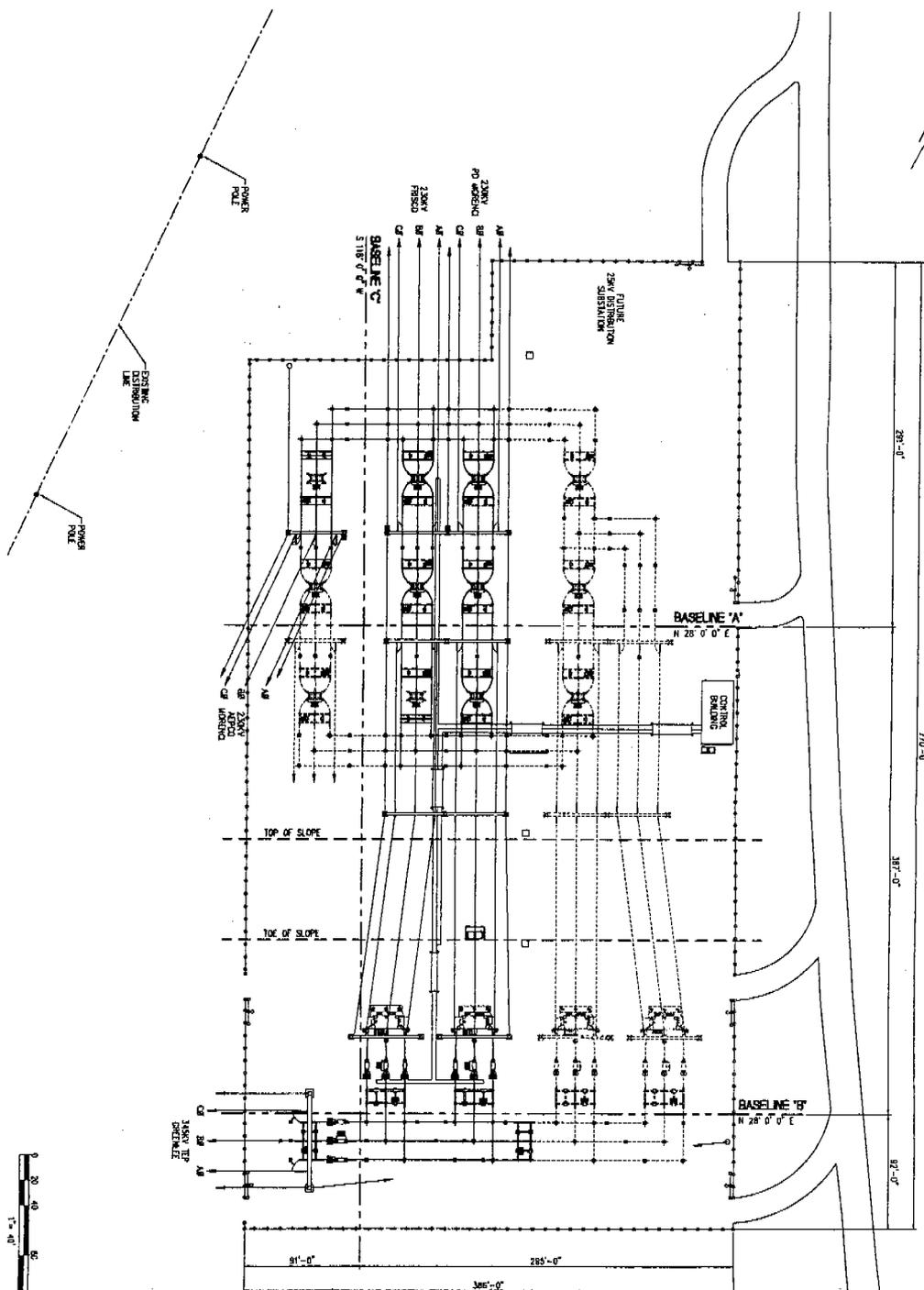
Exhibit G-1



**Typical 345kV Double Circuit
Self-Weathering Steel Structure**
Morenci Water & Electric 345kV Intertie Project

October 1999

Exhibit G-2



LEGEND

- NEW LINE
- - - - - EXISTING DISTRIBUTION LINE
- FUTURE COMPONENT

NO.	DATE	DESCRIPTION	BY	CHKD.
1	10/18/01	ISSUED FOR PERMIT
2	11/15/01	REVISED PER COMMENTS
3	12/10/01	REVISED PER COMMENTS
4	01/15/02	REVISED PER COMMENTS
5	02/15/02	REVISED PER COMMENTS
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126	03/15/12	REVISED PER COMMENTS
127	04/15/12	REVISED PER COMMENTS
128	05/15/12	REVISED PER COMMENTS
129	06/15/12	REVISED PER COMMENTS
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132	09/15/12	REVISED PER COMMENTS
133	10/15/12	REVISED PER COMMENTS
134	11/15/12	REVISED PER COMMENTS
135	12/15/12	REVISED PER COMMENTS
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137	02/15/13	REVISED PER COMMENTS
138	03/15/13	REVISED PER COMMENTS
139	04/15/13	REVISED PER COMMENTS
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200	05/15/18	REVISED PER COMMENTS



MORENO DISTRICT SUBSTATIONS

COVER WORK
 COVER VENT SUBSTATION
 GENERAL ARRANGEMENT PLAN

DATE: 10/18/01
 DRAWING NO.: 22-1-003
 SHEET NO.: 1 OF 1

Exhibit G-3

EXHIBIT H - EXISTING PLANS

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 plans 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 described in Exhibit A and also in the Bureau of Land Management (BLM) Environmental Assessment, Chapter 3 (Exhibit B-2). Exhibit A-2 depicts in detail the existing and future land uses inventoried within the study area. Construction of the transmission line and substation would not conflict with the existing or planned developments of government or private entities along the proposed route. The BLM's Decision Record and Finding of No Significant Impact are attached as Exhibit B-1.

AGENCY AND PUBLIC COORDINATION

A public contact program was conducted for the proposed project to provide information to federal, state, and local government agencies and private entities, as well as to obtain input and identify issues relative to the proposed project. A summary of Native American consultations, public contact letters, and public response letters are located in Exhibit J. Additionally, public notices and the fact sheet are located in Exhibit J.

A list of contacts made as a result of the public contact program follows.

Federal

U.S. Department of Agriculture
Natural Resources Conservation Service
Arizona State Office, Phoenix, Arizona

U.S. Department of Interior
Bureau of Land Management
Safford Field Office, Safford, Arizona
U.S. Fish and Wildlife Service
Phoenix, Arizona Office

Federal Aviation Administration
Southwest Pacific Region, California

Native Americans

Ak-Chin Indian Community
Maricopa, Arizona

Gila River Indian Community
Sacaton, Arizona

Hopi Tribe
Kykotsmovi, Arizona

Salt River Pima-Maricopa Indian Community
Scottsdale, Arizona

San Carlos Apache Tribe
San Carlos, Arizona

Tohono O'odham Nation
Sells, Arizona

White Mountain Apache Tribe
Fort Apache Indian Reservation
White Mountain, Arizona

Zuni Tribe
Zuni, New Mexico

State

Arizona Department of Commerce
Population Statistics Unit, Phoenix, Arizona

Arizona Department of Economic Security
Phoenix, Arizona

Arizona Department of Transportation
Roadside Development, Phoenix, Arizona
Highways Division, Phoenix, Arizona

Arizona Game & Fish Department
Phoenix, Arizona

Arizona State Historic Preservation Office
Phoenix, Arizona

Arizona State Museum
University of Arizona, Tucson, Arizona

Arizona State University
Department of Anthropology, Tempe, Arizona

City and County

Greenlee County
Planning and Development Department
Clifton, Arizona

Town of Clifton
Clifton, Arizona

Morenci, Arizona

EXHIBIT I – ANTICIPATED NOISE 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.”

ELECTRICAL EFFECTS

The electrical effects of this transmission line are those associated with electrical field, magnetic field, and corona. Electric and magnetic fields (EMF) can result in induced voltage on objects near the transmission line. Corona effects are manifested in audible noise, radio interference, and television interference. The effects will be minimized by line location, line design, and construction practices.

CORONA

Corona is a partial electrical breakdown that results in the transformation of energy into very small amounts of light, sound, radio noise, chemical reaction, and heat. Corona results when the voltage gradient surrounding energized conductors or hardware exceeds the breakdown strength of air, resulting in electrical discharges. It is more severe during rainy or damp weather, when the breakdown strength of air is reduced.

Corona is a recognized phenomenon, and it is considered in the design of electrical hardware and equipment as well as in the specific design of this transmission line. To reduce the surface voltage gradient for the line, a double bundle configuration, or two conductors per phase, has been selected. By using a bundle configuration, the “effective” conductor diameter and surface area is significantly increased, thus lowering the surface voltage gradient. The maximum conductor surface gradient for this line is estimated to be 15 kilovolt/centimeter, which is substantially lower than what would be generated if only one single phase conductor was used. Corona is not anticipated to be a problem for this line design.

RADIO AND TELEVISION INTERFERENCE

Overhead transmission lines generally do not interfere with normal radio and television reception. Corona and gap discharges, however, are two potential sources of interference. Corona, as described above, may affect radio and television reception. However, due to the conductor hardware that will be used and the bundled conductor design, the corona, and thus interference, will be minimal and is not expected to be a problem.

Gap discharges result from electrical discharges between broken or poorly fitting hardware, such as insulators, clamps, and brackets. The hardware is designed to prevent gap discharges; however, mechanical damage due to wind induced (aeolian) vibration, corrosion, gunshot, or other causes may create a condition where gap discharges can occur. Gaps between contact points on hardware, at which small electrical discharges can occur, are created. This phenomenon can be found on lines of all voltages, and sometimes occurs when "slack" or low tension spans result in insufficient tension to keep hardware firmly in contact. The discharge across the small gap acts as a low power electrical transmitter and may interfere with some radio and television signals. The stronger the transmitted signals, the higher the quality of the radio or television and its antenna system, and the farther the radio or television is from the gap source, the less it is affected by the gap discharge. Sources of gap discharge are not difficult to locate and can be repaired should they occur.

A much more likely source of radio and television interference arises through electrical equipment in the home itself. The line voltage and the distance of prospective line routes from residences minimizes the likelihood of objectionable audible noise, radio interference, or television interference from the line. Should it occur, MW&E will record and investigate any complaints of radio and television interference reported, and take corrective action when necessary.

TRANSMISSION LINE AUDIBLE NOISE

Transmission lines can generate a small amount of sound energy. Corona is a partial electrical breakdown of the air next to the energized conductors that can result in very small amounts of sound. This typically is not annoying during fair weather. During rainy or very moist conditions, drops of water can form on the conductors, resulting in increased corona activity when a crackling or humming sound can be heard near the line. The noise decreases with distance from the line.

Concern about noise is related to negative impacts on humans and animals. Human response to noise is most commonly expressed as annoyance, and the level of annoyance may be affected by the intensity of the noise, its frequency (pitch), its duration of exposure, and/or its recurrence.

Ambient noise is the total noise in an environment and usually comprises sounds from many sources. The principal sources of ambient noise in rural and isolated settings are from wind, water, insects, birds and other wildlife, highway traffic, and occasional recreational users and airplanes.

Audible noise discussions in this section are based on A-weighted sound levels. The A-weighted sound level is defined by the American National Standards Institute as sound that is measured with a sound-level meter using the A-weighted response filter that is built into the meter circuitry. The A-weighting filter is commonly used to measure community noise as it simulates the frequency response of the human ear.¹

¹ IEEE Standard C57.12.90-1993 Test Code for Liquid Immersed Distribution, Power, and Regulating Transformers and IEEE Guide for Short Circuit Testing of Distribution and Power Transformers

Typical audible sound levels² are as follows:

■ Factory	80 to 90 decibels (dB)
■ Office with Machines	65 to 75 dB
■ Office without Machines	50 to 70 dB
■ Retail Store	45 to 60 dB
■ Home at Night	25 to 45 dB

Audible noise within the right-of-way for this project is estimated to be below 40 dB during fair weather conditions and well below 70 dB during heavy rain. Due to the low audible noise level, the relatively few hours of audible noise producing weather, and location of the transmission line with respect to neighboring land uses (the closest resident is approximately 0.5 mile away), no audible noise problems are anticipated.

Substation Audible Noise

Sources of audible noise within a substation can include transformers, reactors, voltage regulators, circuit breakers, and other intermittent noise generators. Among these sources, transformers and reactors have the greatest potential for producing noise. Reactors are similar to a transformer in terms of audible noise. The broadband sound from fans, pumps, and coolers has the same character as ambient sound and tends to blend in with the ambient noise.³

At a distance of 15 meters (approximately 50 feet), a large transformer has an audible noise level of about 57 A-weighted decibels (dBA). At a distance of 30 meters (approximately 100 feet) this noise level would be about 51 dBA, which is similar to an urban residence. The noise level for a small-town residence is about 45 dBA.⁴

As a general rule, substation noise will not be a problem if, when combined with the ambient noise, it is less than 5 dBA above the ambient noise level.⁵ Based on the above example and a calculation method for combining noise levels from the Handbook of Acoustical Measurements and Noise Control, the following noise level increases would occur at 15 meters (50 feet) from a large transformer:

- for an urban residence the combined noise level would increase approximately 1 dBA
- for a small-town residence the combined noise level would increase approximately 0.25 dBA

In the above examples the combined noise levels are less than the 5 dBA above the ambient noise level and, therefore, audible noise would not be expected to be a problem in this example.

² Transformers and Motors by George Patrick Shultz; publisher Howard W. Sams & Company

³ Standard Handbook for Electrical Engineers, Thirteenth Edition, by Donald G. Fink and H. Wayne Beaty, published by McGraw-Hill

⁴ Handbook of Acoustical Measurements and Noise Control, Third Edition, by Cyril M. Harris, published by McGraw Hill

⁵ REA Bulletin 65-1, Design Guide for Rural Substations

Sound levels attenuate (lessen) with distance. Approximately a 6-dBA reduction can be obtained with each doubling of the distance between the source and the point of measurement. This is equivalent to a decrease of 20 dBA for each increase in distance from the source by a factor of ten.⁶

The nearest residences to the Copper Verde Substation are approximately 0.5 mile away, so audible noise originating from the substation transformers is not anticipated to result in a noticeable overall change in audible noise and, consequently, audible noise from the substation facilities is not an issue for this project.

ELECTRIC AND MAGNETIC FIELDS

The change in voltage over distance is known as the electric field. The units describing an electric field are volts per meter (V/m) or kilovolts per meter (kV/m). The electric field becomes stronger near a charged object and decreases with distance away from the object.

Electric fields are a very common phenomenon. Static electric fields can result from friction generated when taking off a sweater or walking across a carpet. Almost all household appliances and other devices that operate on electricity create electric fields.

An electric current flowing in a conductor (electric equipment, household appliance, or otherwise) creates a magnetic field. The most commonly used magnetic field intensity unit is the Gauss or milliGauss (mG), which is a measure of the magnetic flux density (intensity of magnetic field attraction per unit area).

The magnetic fields under transmission and distribution lines and near substations are relatively low, at least in comparison with measurements near many household appliances and other equipment. The magnetic field near an appliance decreases with distance away from the device. The magnetic field also decreases with distance away from electrical power lines and substation equipment (such as transformers and capacitor banks).

There are no national or federal government standards in the United States for EMF exposure. A few states have some type of electric field guideline and two states have a magnetic field standard. These guidelines are summarized in Table I-1.

The International Non-Ionizing Radiation Committee of the International Radiation Protection Association has published "Interim Guidelines on Limits of Exposure to 50/60-Hz and Magnetic Fields" in the January 1990 issue of Health Physics. The guidelines were approved by the council on May 3, 1989; those guidelines relating to the general public are summarized in Table I-2.

⁶ Handbook of Acoustical Measurements and Noise Control, Third Edition, by Cyril M. Harris, published by McGraw Hill

**TABLE I-1
STATE REGULATIONS THAT LIMIT FIELD STRENGTHS ON
TRANSMISSION LINE RIGHTS-OF-WAY**

State	Field Limit
Montana	1kV/m at edge of right-of-way in residential areas
Minnesota	8kV/m maximum in right-of-way
New Jersey	3kV/m at edge of right-of-way
New York	16kV/m at edge of right-of-way; 200 mG at edge of right-of-way
North Dakota	9kV/m maximum in right-of-way
Oregon	9kV/m maximum in right-of-way
Florida	10kV/m maximum for 500kV lines in right-of-way; 2kV/m maximum for 500kV lines at edge of right-of-way; 8kV/m maximum for 230kV and smaller lines in right-of-way; 3kV/m maximum for 230kV and smaller lines at edge of right-of-way; 200 mG for 500kV lines at edge of right-of-way; 250 mG for double circuit 500kV lines at edge of right-of-way; and 150 mG for 230kV and smaller lines at edge of right-of-way

**TABLE II-2
IRPA GENERAL PUBLIC EXPOSURE GUIDELINES**

Exposure	Electric Field	Magnetic Field
Up to 24 hours/day	5kV/m	1,000 mG
Few hours/day	10kV/m	10,000 mG

The anticipated electric fields for the proposed line are a maximum of 6.69kV/meter within the right of way and 1.9kV/meter at the edge of right of way. The anticipated magnetic fields for the proposed line are a maximum of 275 mG within the right of way and 69 mG at the edge of right-of-way. These levels are well within all guidelines and the fields are not expected to be a problem with this line.

EMF Health Effects

The issue of health effects due to exposure to EMF is always a subject of discussion. EMF exposure in residential and occupational situations has been studied for a wide variety of sources, including transmission lines, distribution lines, household wiring, electric appliances, electrically operated equipment or machinery, and others.

A number of studies over the last 20 years or so generally have found no conclusive evidence of harmful effects from typical power line and substation EMF. Some studies during this period did report the potential for harmful effects. The evidence for such an association is inconclusive, and the most recent independent comprehensive review of the scientific literature by the National Academy of Sciences, *Possible Health Effects of Exposure to Residential Electric and Magnetic Fields* (1997), reached the following conclusions:

“Based on a comprehensive evaluation of published studies relating to the effects of power-frequency electric and magnetic fields on cells, tissues, and organisms (including humans), the conclusion of the committee is that the current body of evidence does not show that exposure to these fields presents a human-health hazard. Specifically, no conclusive and consistent evidence shows that exposures to residential electric and magnetic fields produce cancer, adverse neurobehavioral effects, or reproductive and developmental effects.

The committee reviewed residential exposure levels to electric and magnetic fields, evaluated the available epidemiologic studies, and examined laboratory investigations that used cells, isolated tissues, and animals. At exposure levels well above those normally encountered in residences, electric and magnetic fields can produce biologic effects (promotion of bone healing is an example), but these effects do not provide a consistent picture of a relationship between the biologic effects of these fields and health hazards. An association between residential wiring configurations (called wire codes) and childhood leukemia persists in multiple studies, although the causative factor responsible for that statistical association has not been identified. No evidence links contemporary measurements of magnetic-field levels to childhood leukemia.”

ELECTRIC INDUCTION

Electric induction is the capacitive coupling of a voltage onto insulated objects near the transmission line. The induced voltage is a function of line voltage, insulation, object dimensions, and line height. This voltage produces a short circuit when an insulated object is grounded.

The magnitude of the short circuit current is dependent upon the open circuit voltage, resistance of the object to ground, and the impedance of the grounding object. The discharge of this voltage creates an arc similar to that generated by static electricity obtained by a person walking across nylon carpeting.

The design ground clearance for this line will be sufficient to meet the National Electric Safety Code Rule 232.C.1.c that dictates that the short circuit current must be limited to a maximum of 5 milliamperes due to electrostatic effects. Thus, electrical induction effects will not be a problem with the 345kV transmission line.

MAGNETIC INDUCTION

Magnetic induction is a result of a current in a conductor coupling voltage into a parallel circuit. The maximum induced voltage occurs when the two circuits are parallel and reduces to a minimum when perpendicular. The parallel circuits may be other power lines, communication circuits, fences, etc. The induced voltage is a function of the line current, distance from the line, and height of the conductors.

Successful operation of 345kV lines has demonstrated that, with normal grounding procedures, no harmful effects will be encountered from magnetic induction.

EXHIBIT J – SPECIAL FACTORS

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.”

PUBLIC INVOLVEMENT ACTIVITIES IN THE ENVIRONMENTAL STUDY AND SITING PROCESS

The public contact program for the project entailed federal, state, and local contacts in conjunction with a public open house and mailing of the fact sheet to a Bureau of Land Management (BLM)-provided mailing list. Public comments, public notices, fact sheet, and mailing list are provided in the following exhibits:

- Exhibit J-1: Public Comments
- Exhibit J-2: Public Notices
- Exhibit J-3: Fact Sheet

PUBLIC OPEN HOUSE MEETING

A fact sheet announcing the public open house meeting was mailed to a BLM-provided mailing list. The public open house was held on January 28, 1999 in Clifton, Arizona in an effort to discuss and collect public and agency comments of the potential transmission line alternatives and the environmental planning process. Notices of the public open house in Clifton appeared in the *Eastern Arizona Courier* on January 20 and 27 and in *The Copper Era* on January 20 and 27, 1999. Sign in sheets indicated an attendance of 5 persons. Materials provided at the open house consisted of fact sheets, comment forms, project maps (preliminary alternative transmission line corridors considered, proposed structure type, and purpose and need information) and resource maps (existing and future land use and jurisdiction). Project team members, including the BLM, were available throughout the public open house to answer questions. Comment forms were available for people to either fill out at the public open house or return to the BLM at a later date. A copy of the fact sheet is provided at the end of this exhibit (Exhibit J-3).

Individuals who attended the public open house and other interested parties (via mailed in comment forms) were added to the mailing list and at the request of the BLM were mailed a copy of the environmental assessment (EA) for review. Other parties contacted included federal, state, and local governments, and Native American Tribes that are listed in Exhibit H. Responses from the public that were received at the open house and throughout the EA comment period were incorporated into the evaluation of alternatives.

NATIVE AMERICAN CONSULTATIONS

The BLM consulted with the following eight Native American Communities concerning the proposed transmission line:

- Ak-Chin Indian Community
- Gila River Indian Community
- Hopi Tribe
- Salt River Pima-Maricopa Indian Community
- San Carlos Apache Tribe
- Tohono O'odham Nation
- White Mountain Apache Tribe
- Zuni Tribe

To initiate consultation, tribal governing officials and cultural preservation specialists were sent copies of the fact sheet described in the preceding section. At the BLM's request, Dames & Moore made follow-up telephone calls (and sent replacement copies of the fact sheet when requested) to (1) confirm receipt of the fact sheet, (2) ask whether the tribe had an interest in the project area, and (3) determine whether the tribe wished to receive additional information about the project as it became available. Dames & Moore's contacts accumulated to over 100 telephone calls and facsimiles. All eight contacted tribes expressed interest in continuing to receive information about the project. The Four Southern Tribes (Ak-Chin, Gila River, Salt River, and the Tohono O'odham Nation) decided Gila River would take the lead for them. San Carlos indicated they likely would work with the White Mountain Apache Tribe.

Written comments were provided by the Hopi, White Mountain Apache, and Zuni tribes during preparation of the EA. The Hopi Tribe indicated that the general area is of traditional cultural concern to a number of their clans and, therefore, requested full participation in the National Environmental Policy Act process including identification and assessment of specific resources that might be subject to effect. The BLM responded that Hopi representatives were welcome to conduct an inspection of the project area. The White Mountain Apache Tribe expressed opposition to the project through Apache ancestral lands but did not identify specific cultural resource locations of concern. The Zuni Tribe indicated that ancestral Zunis had migrated into the general area although specific locations are not known; they requested further consultation and indicated that their principal concern relates to protection of prehistoric properties.

A copy of the draft EA was sent directly to the cultural preservation specialist at each of the eight tribes. Follow up telephone calls were made (and facsimiles sent) by Dames & Moore to (1) ensure receipt of the draft EA and encourage review and response, and (2) reiterate that the comment period would end on 23 August 1999. All recipients acknowledged receipt of the EA. As of 27 August 1999, no further responses have been received.

A copy of the cultural resource inventory report for the proposed route also will be sent to the cultural preservation specialists at each of the eight tribes when it is available.

**EXHIBIT J-1
PUBLIC COMMENTS**



GAME & FISH DEPARTMENT

2221 West Greenway Road, Phoenix, Arizona 85023-4399 (602) 942-3000
www.gf.state.az.us

Governor

Jane Dee Hull

Commissioners:

Chairman, Herb Guenther, Tucson

Michael M. Golightly, Flagstaff

William Berlat, Tucson

M. Jean Hassell, Scottsdale

Dennis D. Manning, Alpine

Director

Duane L. Shroufe

Deputy Director

Thomas W. Spalding

February 10, 1999

Ms. Kimberley A. Otero
Project Biologist
Dames and Moore
Cambric Corporate Center
1790 East River Road, Suite E-300
Tucson, Arizona 85718-5876

Re: Special Status Species: Environmental Assessment and
Certificate of Environmental Compatibility Application for
Proposed Greenlee to Morenci Transmission Line

Dear Ms. Otero:

The Arizona Game and Fish Department (Department) has reviewed your letter, dated December 14, 1998, regarding special status species in the above-referenced area, and the following information is provided.

The Department's Heritage Data Management System has been accessed and current records show that the special status species listed below have been documented as occurring in the project vicinity.

<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>	<u>STATUS</u>
common black-hawk	<i>Buteogallus anthracinus</i>	WC, S
San Carlos wild-buckwheat	<i>Eriogonum capillare</i>	S, SR

STATUS DEFINITIONS

WC - Wildlife of Special Concern in Arizona. Species whose occurrence in Arizona is or may be in jeopardy, or with known or perceived threats or population declines, as described by the Department's listing of Wildlife of Special Concern in Arizona (WSCA, in prep.). Species included in WSCA are currently the same as those in Threatened Native Wildlife in Arizona (1988).

S - Sensitive. Species classified as "sensitive" by the Regional Forester when occurring on lands managed by the U.S.D.A. Forest Service.

Ms. Kimberly Otero
February 10, 1999
2

SR - Salvage Restricted. Those Arizona native plants not included in the Highly Safeguarded Category, but that have a high potential for theft or vandalism, as described by the Arizona Native Plant Law (1993).

At this time, the Department's comments are limited to the special status species information provided above. This correspondence does not represent the Department's evaluation of impacts to wildlife or wildlife habitat associated with activities occurring in the subject area. Please contact me at (602) 789-3605, if you have any questions regarding this letter.

Sincerely,



Bob Broscheid
Project Evaluation Specialist
Habitat Branch

BDB:bb

cc: Joan Scott, Habitat Program Manager, Region V, Tucson

AGFD# 1-15-99(02)



United States Department of the Interior
Fish and Wildlife Service

Arizona Ecological Services Field Office
2321 W. Royal Palm Road, Suite 103
Phoenix, Arizona 85021-4951
(602) 640-2720 Fax (602) 640-2730



In Reply Refer To:

AESO/SE
2-21-99-I-100
[CCN 990165]

January 20, 1999

Ms. Kimberly A. Otero
Dames & Moore
1790 East River Road, Suite E-300
Tucson, Arizona 85718-5876

RE: EA for Proposed Greenlee to Morenci 345kV Transmission Line (Job No. 00136-113-050)

Dear Ms. Otero:

This letter responds to your December 14, 1998, request for an inventory of threatened or endangered species, or those that are proposed to be listed as such under the Endangered Species Act of 1973, as amended (Act), which may potentially occur in your project area (Greenlee County). The enclosed list may include candidate species as well. We hope the enclosed county list of species will be helpful. In future communications regarding this project, please refer to consultation number 2-21-99-I-100.

Please be aware that you may also access limited county species lists for Arizona on our internet web site at the following:

<http://ifw2es.fws.gov/endspcs/lists/>

The enclosed list of the endangered, threatened, proposed, and candidate species includes all those potentially occurring anywhere in the county, or counties, where your project occurs. Please note that your project area may not necessarily include all or any of these species. The information provided includes general descriptions, habitat requirements, and other information for each species on the list. Also on the enclosed list is the Code of Federal Regulations (CFR) citation for each listed or proposed species. Additional information can be found in the CFR and is available at most public libraries. This information should assist you in determining which species may or may not occur within your project area. Site-specific surveys could also be helpful and may be needed to verify the presence or absence of a species or its habitat as required for the evaluation of proposed project-related impacts.

Endangered and threatened species are protected by Federal law and must be considered prior to project development. If the action agency determines that listed species or critical habitat may be adversely affected by a federally funded, permitted, or authorized activity, the action agency must request formal consultation with the Service. If the action agency determines that the planned action may jeopardize a proposed species or destroy or adversely modify proposed

critical habitat, the action agency must enter into a section 7 conference with the Service. Candidate species are those which are being considered for addition to the list of threatened or endangered species. Candidate species are those for which there is sufficient information to support a proposal for listing. Although candidate species have no legal protection under the Act, we recommend that they be considered in the planning process in the event that they become listed or proposed for listing prior to project completion.

If any proposed action occurs in or near areas with trees and shrubs growing along watercourses, known as riparian habitat, the Service recommends the protection of these areas. Riparian areas are critical to biological community diversity and provide linear corridors important to migratory species. In addition, if the project will result in the deposition of dredged or fill materials into waterways or excavation in waterways, we recommend you contact the Army Corps of Engineers which regulates these activities under Section 404 of the Clean Water Act.

The State of Arizona protects some plant and animal species not protected by Federal law. We recommend you contact the Arizona Game and Fish Department and the Arizona Department of Agriculture for State-listed or sensitive species in your project area.

The Service appreciates your efforts to identify and avoid impacts to listed and sensitive species in your project area. If we may be of further assistance, please feel free to contact Tom Gatz.

Sincerely,

A handwritten signature in black ink, appearing to read "David L. Harlow", with a long horizontal flourish extending to the right.

David L. Harlow
Field Supervisor

Enclosure

cc: Director, Arizona Game and Fish Department, Phoenix, AZ

1/14/99

1) LISTED

TOTAL= 9

NAME: MEXICAN GRAY WOLF

CANIS LUPUS BAILEYI

STATUS: ENDANGERED

CRITICAL HAB No RECOVERY PLAN: Yes CFR: 32 FR 4001, 03-11-67; 43

DESCRIPTION: LARGE DOG-LIKE CARNIVORE WITH VARYING COLOR, BUT USUALLY A
SHADE OF GRAY. DISTINCT WHITE LIP LINE AROUND MOUTH. WEIGH 60-
90 POUNDS.

FR 1912, 03-09-78

ELEVATION

RANGE: 4,000-12,000 FT.

COUNTIES: APACHE, COCHISE, GREENLEE, PIMA, SANTA CRUZ

HABITAT: CHAPPARAL, WOODLAND, AND FORESTED AREAS. MAY CROSS DESERT AREAS.

HISTORIC RANGE IS CONSIDERED TO BE LARGER THAN THE COUNTIES LISTED ABOVE. UNCONFIRMED REPORTS OF INDIVIDUALS IN THE SOUTHERN PART OF THE STATE (COCHISE, PIMA, SANTA CRUZ) CONTINUE TO BE RECEIVED. INDIVIDUALS MAY STILL PERSIST IN MEXICO. EXPERIMENTAL NONESSENTIAL POPULATION INTRODUCED IN THE BLUE PRIMITIVE AREA OF GREENLEE AND APACHE COUNTIES.

NAME: APACHE (ARIZONA) TROUT

ONCORHYNCHUS APACHE

STATUS: THREATENED

CRITICAL HAB No RECOVERY PLAN: Yes CFR: 40 FR 29864, 07-19-1975

DESCRIPTION: THIS YELLOWISH OR YELLOW-OLIVE CUTTHROAT-LIKE TROUT HAS
LARGE DARK SPOTS ON BODY. ITS DORSAL, ANAL, AND CAUDAL FINS
EDGED WITH WHITE. IT HAS NO RED LATERAL BAND.

ELEVATION

RANGE: >5000 FT.

COUNTIES: APACHE, GREENLEE, GILA, GRAHAM, NAVAJO

HABITAT: PRESENTLY RESTRICTED TO COLD MOUNTAIN STREAMS WITH MANY LOW GRADIENT MEADOW REACHES

OCCUPIES STREAM HABITATS WITH SUBSTRATES OF BOULDERS, ROCKS, AND GRAVEL WITH SOME SAND OR SILT THROUGH MIXED CONIFER AND SPRUCE-FIR FORESTS, AND MONTANE MEADOWS AND GRASSLANDS IN THE WHITE MOUNTAINS. ALSO MANAGED AS A SPORT FISH UNDER SPECIAL REGULATIONS.

NAME: LOACH MINNOW

TIAROGA COBITIS

STATUS: THREATENED

CRITICAL HAB No RECOVERY PLAN: Yes CFR: 51 FR 39468, 10-28-1986;

DESCRIPTION: SMALL (<3 INCHES LONG) SLENDER, ELONGATED FISH, OLIVE COLORED
WITH DIRTY WHITE SPOTS AT THE BASE OF THE DORSAL AND CAUDAL
FINS. BREEDING MALES VIVID RED ON MOUTH AND BASE OF FINS

59 FR 10898, 03-08-1994

ELEVATION

RANGE: <7000 FT.

COUNTIES: PINAL, GRAHAM, GREENLEE, GILA, APACHE, NAVAJO, (AZ); GRANT, CATRON, (NM)

HABITAT: BENTHIC SPECIES OF SMALL TO LARGE PERENNIAL STREAMS WITH SWIFT SHALLOW WATER OVER
COBBLE & GRAVEL

PRESENTLY FOUND IN ARAVAIPA CREEK, BLUE RIVER, CAMPBELL BLUE CREEK, SAN FRANCISCO RIVER, DRY BLUE CREEK, TULAROSA RIVER, EAST-WEST-AND MIDDLE FORKS OF THE GILA RIVER, AND THE MAINSTEM UPPER GILA RIVER. CRITICAL HABITAT WAS REMOVED IN MARCH 1998.

1/14/99

NAME: RAZORBACK SUCKER

XYRAUCHEN TEXANUS

STATUS: ENDANGERED

CRITICAL HAB Yes RECOVERY PLAN: Yes CFR: 55 FR 21154, 05-22-1990;
59 FR 13374, 03-21-1994DESCRIPTION: LARGE (UP TO 3 FEET AND UP TO 16 POUNDS) LONG, HIGH SHARP-
EDGED KEEL-LIKE HUMP BEHIND THE HEAD. HEAD FLATTENED ON TOP.
OLIVE-BROWN ABOVE TO YELLOWISH BELOW.

ELEVATION

RANGE: <6000 FT.

COUNTIES: GREENLEE, MOHAVE, PINAL, YAVAPAI, YUMA, LA PAZ, MARICOPA (REFUGIA), GILA, COCONINO, GRAHAM

HABITAT: RIVERINE & LACUSTRINE AREAS, GENERALLY NOT IN FAST MOVING WATER AND MAY USE BACKWATERS

SPECIES IS ALSO FOUND IN HORSESHOE RESERVOIR (MARICOPA COUNTY). CRITICAL HABITAT INCLUDES THE 100-YEAR FLOODPLAIN OF THE RIVER THROUGH GRAND CANYON FROM CONFLUENCE WITH PARIA RIVER TO HOOVER DAM; HOOVER DAM TO DAVIS DAM; PARKER DAM TO IMPERIAL DAM. ALSO GILA RIVER FROM AZ/NM BORDER TO COOLIDGE DAM; AND SALT RIVER FROM HWY 60/SR 77 BRIDGE TO ROOSEVELT DAM; VERDE RIVER FROM FS BOUNDARY TO HORSESHOE LAKE.

NAME: SPIKEDACE

MEDA FULGIDA

STATUS: THREATENED

CRITICAL HAB No RECOVERY PLAN: Yes CFR: 51 FR 23769, 07-01-1986;
59 FR 10906, 03-08-1994DESCRIPTION: SMALL (<3 INCHES) SLIM WITH SLIVERY SIDES & "SPINE" ON DORSAL
FIN. BREEDING MALES BRASSY GOLDEN COLOR

ELEVATION

RANGE: <6000 FT.

COUNTIES: GRAHAM, PINAL, GREENLEE, YAVAPAI, (AZ); GRANT, (NM)

HABITAT: MODERATE TO LARGE PERENNIAL STREAMS WITH GRAVEL COBBLE SUBSTRATES AND MODERATE TO SWIFT VELOCITIES

PRESENTLY FOUND IN ARAVAIPA CREEK, EAGLE CREEK, VERDE RIVER ABOVE VERDE VALLEY, EAST-WEST- MAIN AND MIDDLE FORKS OF THE GILA RIVER IN NEW MEXICO, AND GILA RIVER FROM SAN PEDRO RIVER TO ASHURST HAYDEN DAM. CRITICAL HABITAT WAS REMOVED IN MARCH 1998.

NAME: AMERICAN PEREGRINE FALCON

FALCO PEREGRINUS ANATUM

STATUS: ENDANGERED

CRITICAL HAB No RECOVERY PLAN: Yes CFR: 35 FR 16047, 10-13-70; 35
FR 8495, 06-02-70DESCRIPTION: A RECLUSIVE, CROW-SIZED FALCON SLATY BLUE ABOVE WHITISH
BELOW WITH FINE DARK BARRING. THE HEAD IS BLACK AND APPEARS
TO BE MASKED OR HELMETED. WINGS LONG AND POINTED. LOUD
WAILING CALLS ARE GIVEN DURING BREEDING PERIOD.

ELEVATION

RANGE: 3500-9000 FT.

COUNTIES: MOHAVE COCONINO NAVAJO APACHE SANTA CRUZ MARICOPA COCHISE YAVAPAI GILA PINAL PIMA
GREENLEE GRAHAM

HABITAT: CLIFFS AND STEEP TERRAIN USUALLY NEAR WATER OR WOODLANDS WITH ABUNDANT PREY

THIS IS A WIDE-RANGING MIGRATORY BIRD THAT USES A VARIETY OF HABITATS. BREEDING BIRDS ARE YEAR-ROUND RESIDENTS. OTHER BIRDS WINTER AND MIGRATE THROUGH ARIZONA. SPECIES IS ENDANGERED FROM REPRODUCTIVE FAILURE FROM PESTICIDES. SPECIES HAS BEEN PROPOSED FOR DELISTING (63 FR 45446) BUT STILL RECEIVES FULL PROTECTION UNDER ESA

LISTED, PROPOSED, AND CANDIDATE SPECIES FOR THE FOLLOWING COUNTY:

GREENLEE

1/14/99

NAME: CACTUS FERRUGINOUS PYGMY-OWL

GLAUCIDIUM BRASILIANUM CACTORUM

STATUS: ENDANGERED

CRITICAL HAB Yes RECOVERY PLAN: No CFR: 62 FR 10730, 3-10-97

DESCRIPTION: SMALL (APPROX. 7"), DIURNAL OWL REDDISH BROWN OVERALL WITH CREAM-COLORED BELLY STREAKED WITH REDDISH BROWN. SOME INDIVIDUALS ARE GRAYISH BROWN

ELEVATION RANGE: <4000 FT.

COUNTIES: MARICOPA, YUMA, SANTA CRUZ, GRAHAM, GREENLEE, PIMA, PINAL, GILA, COCHISE

HABITAT: MATURE COTTONWOOD/WILLOW, MESQUITE BOSQUES, AND SONORAN DESERTSCRUB

RANGE LIMIT IN ARIZONA IS FROM NEW RIVER (NORTH) TO GILA BOX (EAST) TO CABEZA PRIETA MOUNTAINS (WEST). ONLY A FEW DOCUMENTED SITES WHERE THIS SPECIES PERSISTS ARE KNOWN, ADDITIONAL SURVEYS ARE NEEDED. LISTING EFFECTIVE APRIL 9, 1997. PROPOSED CRITICAL HABITAT IN PIMA, COCHISE, PINAL, AND MARICOPA COUNTIES (64 FR 71821).

NAME: MEXICAN SPOTTED OWL

STRIX OCCIDENTALIS LUCIDA

STATUS: THREATENED

CRITICAL HAB No RECOVERY PLAN: Yes CFR: 56 FR 14678, 04-11-91

DESCRIPTION: MEDIUM SIZED WITH DARK EYES AND NO EAR TUFTS. BROWNISH AND HEAVILY SPOTTED WITH WHITE OR BEIGE.

ELEVATION RANGE: 4100-9000 FT.

COUNTIES: MOHAVE, COCONINO, NAVAJO, APACHE, YAVAPAI, GRAHAM, GREENLEE, COCHISE, SANTA CRUZ, PIMA, PINAL, GILA, MARICOPA

HABITAT: NESTS IN CANYONS AND DENSE FORESTS WITH MULTI-LAYERED FOLIAGE STRUCTURE

GENERALLY NESTS IN OLDER FORESTS OF MIXED CONIFER OR PONDEROSA PINE/GAMBEL OAK TYPE, IN CANYONS, AND USE VARIETY OF HABITATS FOR FORAGING. SITES WITH COOL MICROCLIMATES APPEAR TO BE OF IMPORTANCE OR ARE PREFERRED.

NAME: SOUTHWESTERN WILLOW FLYCATCHER

EMPIDONAX TRAILLII EXTIMUS

STATUS: ENDANGERED

CRITICAL HAB Yes RECOVERY PLAN: No CFR: 60 FR 10694, 02-27-95

DESCRIPTION: SMALL PASSERINE (ABOUT 6") GRAYISH-GREEN BACK AND WINGS, WHITISH THROAT, LIGHT OLIVE-GRAY BREAST AND PALE YELLOWISH BELLY. TWO WINGBARS VISIBLE. EYE-RING FAINT OR ABSENT.

ELEVATION RANGE: <8500 FT.

COUNTIES: YAVAPAI, GILA, MARICOPA, MOHAVE, COCONINO, NAVAJO, APACHE, PINAL, LA PAZ, GREENLEE, GRAHAM, YUMA, PIMA, COCHISE, SANTA CRUZ

HABITAT: COTTONWOOD/WILLOW & TAMARISK VEGETATION COMMUNITIES ALONG RIVERS & STREAMS

MIGRATORY RIPARIAN OBLIGATE SPECIES THAT OCCUPIES BREEDING HABITAT FROM LATE APRIL TO SEPTEMBER. DISTRIBUTION WITHIN ITS RANGE IS RESTRICTED TO RIPARIAN CORRIDORS. DIFFICULT TO DISTINGUISH FROM OTHER MEMBERS OF THE EMPIDONAX COMPLEX BY SIGHT ALONE. TRAINING SEMINAR REQUIRED FOR THOSE CONDUCTING FLYCATCHER SURVEYS. CRITICAL HABITAT ON PORTIONS OF THE 100-YEAR FLOODPLAIN ON SAN PEDRO AND VERDE RIVERS; WET BEAVER AND WEST CLEAR CREEKS, INCLUDING TAVASCI MARSH AND ISTER FLAT; THE COLORADO RIVER, THE LITTLE COLORADO RIVER, AND THE WEST, EAST, AND SOUTH FORKS OF THE LITTLE COLORADO RIVER, REFERENCE 60 CFR:62 FR 39129, 7/22/97.

1/14/99

3) CANDIDATE

TOTAL= 2

NAME: GILA CHUB

GILA INTERMEDIA

STATUS: CANDIDATE CRITICAL HAB No RECOVERY PLAN: No CFR:

DESCRIPTION: DEEP COMPRESSED BODY, FLAT HEAD. DARK OLIVE-GRAY COLOR ABOVE, SILVER SIDES. ENDEMIC TO GILA RIVER-BASIN.

ELEVATION RANGE: 2000 - 3500 FT.

COUNTIES: SANTA CRUZ, GILA, GREENLEE, PIMA, COCHISE, GRAHAM, YAVAPAI

HABITAT: POOLS, SPRINGS, CIENEGAS, AND STREAMS

MULTIPLE PRIVATE LANDOWNERS, INCLUDING THE NATURE CONSERVANCY, THE AUDUBON SOCIETY, AND OTHERS. ALSO FT. HUACHUCA. SPECIES ALSO FOUND IN SONORA, MEXICO.

NAME: CHIRICAHUA LEOPARD FROG

RANA CHIRICAHUENSIS

STATUS: CANDIDATE CRITICAL HAB No RECOVERY PLAN: No CFR:

DESCRIPTION: CREAM COLORED TUBERCULES (spots) ON A DARK BACKGROUND ON THE REAR OF THE THIGH, DORSOLATERAL FOLDS THAT ARE INTERRUPTED AND DEFLECTED MEDIALY, AND A CALL GIVEN OUT OF WATER DISTINGUISH THIS SPOTTED FROG FROM OTHER LEOPRD:

ELEVATION RANGE: 3000-8300 FT.

COUNTIES: SANTA CRUZ, APACHE, GILA, PIMA, COCHISE, GREENLEE, GRAHAM, YAVAPAI, COCONINO, NAVAJO

HABITAT: STREAMS, RIVERS, BACKWATERS, PONDS, AND STOCK TANKS THAT ARE FREE FROM INTRODUCED FISH AND BULLFROGS

REQUIRE PERMANENT OR NEARLY PERMANENT WATER SOURCES. POPULATIONS NORTH OF THE GILA RIVER ARE THOUGHT TO BE CLOSELY-RELATED, BUT DISTINCT, UNDESCRIBED SPECIES. SPECIES ALSO FOUND ON FORT HUACHUCA

1/14/99

CONSERVATION AGREEMENT

TOTAL= 1

NAME: GOODDINGS ONION

ALLIUM GOODDINGII

STATUS: NONE

CRITICAL HAB No RECOVERY PLAN: No CFR:

DESCRIPTION: HERBACEOUS PERNIAL PLANT; BROAD, FLAT, RATHER BLUNT LEAVES;
FLOWERING STALK 14-17 INCHES TALL, FLATTENED, AND NARROWLY
WINGED TOWARD APEX; FRUIT IS BROADER THAN LONG; SEEDS ARE
SHORT AND THICK

ELEVATION

RANGE: > 7,500 FT FT.

COUNTIES: APACHE, GREENLEE, PIMA

HABITAT: FORESTED DRAINAGE BOTTOMS AND ON MOIST NORTH FACING SLOPES OF MIXED CONIFER AND
SPRUCE FIR FORESTS

CONSERVATION AGREEMENT BETWEEN THE SERVICE AND THE FOREST SERVICE FINALIZED IN 1997. IN NEW
MEXICO ON THE LINCOLN AND GILA NATIONAL FORESTS



Arizona Department of Agriculture

1688 West Adams, Phoenix, Arizona 85007
(602) 542-4373 FAX (602) 542-0999

PLANT SERVICES DIVISION

January 27, 1999

Kimberly A. Otero
Project Biologist
Dames & Moore
Cambric Corporate Center
1790 E. River Rd., Ste. E-300
Tucson, AZ 85718-5876

RE: **D & M Job Number 00136-113-050**

Dear Ms. Otero:

The Arizona Department of Agriculture has reviewed the referenced information and maps dated December 14, 1998.

The Department recommends that, if any protected native plants exist on site, they be avoided or transplanted preferably on site. If any plants or wood are removed from the site for personal use, State permits must first be obtained.

If it is not known if protected plants occur on the proposed project site, the Department, upon request, will conduct a survey of the site to determine the type and number of protected plants present. The applicant, however, will be billed for the survey. The Department will also accept survey counts from other competent sources.

We appreciate the opportunity to review the proposed actions. If you need additional information, please contact me at 602/542-3292.

Sincerely,

A handwritten signature in cursive script that reads "James McGinnis".

James McGinnis
Chief Enforcement Officer
Native Plants/Antiquities

JM:clw

TABLE 1.
SPECIAL STATUS SPECIES
 Special Status Species Likely to Occur in the Habitats Traversed by the Preferred Alternative Corridors
 for the Greenlee to Morenci 345kV Transmission Line Project

Federal Status
 E=Endangered
 T=Threatened
 C=Candidate
 BLM S=BLM Sensitive

State Status - Wildlife
 WC=Wildlife of Special Concern in Arizona

State Status - Plant
 ANPL=Arizona Native Plant Law SR =
 salvage restricted

Key:

Species Common Name	Scientific Name	Habitat Type	Status		Occurrence Known or Potential
			Fed	State	
BIRDS					
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	variety, steep area with cliffs near water	E		low potential for foraging; no nest sites; primarily migratory
Cactus Ferruginous Pygmy-owl	<i>Glaucidium brasilianum cactorum</i>	riparian habitats in desertscrub	E		low to no potential, east of known historic range
Southwestern Willow Flycatcher	<i>Empidonax traillii eximius</i>	riparian	E		low to no potential, limited riparian habitat along San Francisco; no critical habitat in the project area
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	forested canyons	T		no suitable habitat
Common Black-hawk	<i>Buteogallus anthracinus</i>	riparian habitat along perennial streams		WC	
AMPHIBIANS					
Chiricahua Leopard Frog	<i>Rana chiricahuensis</i>	found mainly in rocky areas within permanent streams	C		low potential
FISH					
Apache Trout	<i>Onchorhynchus apache</i>	cold, mountain streams	T		no potential, no habitat
Loach Minnow	<i>Tairoga cobitis</i>	perennial streams with swift shallow water and gravel bottom	T		no potential, known habitat is northwest of the project area
Razorback Sucker	<i>Xyrauchen texanus</i>	streams and rivers with slow backwater areas and eddies	E		no potential, no critical habitat in the project area
Spikedace	<i>Meda fulgida</i>	moderate-fast flowing perennial streams with gravel substrates	T		no potential, no critical habitat within the project area
Gila Chub	<i>Gila intermedia</i>	pools, springs, cienegas, and streams	C		no potential, known range not within project area
PLANTS					
Arizona Hedgehog Cactus	<i>Echinocereus triglochidiatus arizonicus</i>	oak woodland/ chaparral to desert scrub habitats	E		low to moderate potential for occurrence adjacent to San Francisco River
San Carlos Buckwheat	<i>Eriogonum capillare</i>	grasslands, 2,000-3,000 feet elevation		ANPL SR	low potential



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Safford District Office

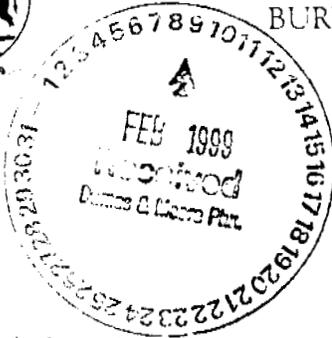
711 14th Avenue

Safford, AZ 85546
(520) 348-4400



In reply refer to:

2850 AZA 30869 (04227)



February 8, 1999

Mr. Richard Knox
Dames and Moore
7500 North Dreamy Draw Drive, Suite 145
Phoenix, Arizona 85020

Dear Mr. Knox:

A Draft Work Plan and Preliminary Plan of Development for the Greenlee to Morenci 345kv Transmission Line Project and Environmental Assessment (EA) was submitted to our office in December 1998 for BLM review and comment. The statement of work and approach for EA preparation are satisfactory and we would ask you to proceed as outlined in these documents. Enclosed is a memo from archaeologist Gay Kinkade discussing the Work Plan and tribal consultation. Thank you for your assistance.

Sincerely,

Scott Evans
Realty Specialist

1 Enclosure

Sevans:sp:02/08/99:MWE345kvworkplan

To: Scott Evans
From: Gay Kinkade
Subject: Greenlee to Morenci 345 KV Transmission Line Project
Date: January 28, 1999

I have reviewed the Draft Work Plan and the Preliminary Plan of Development, and have spoken to Richard Knox and Simon Bruder of Dames & Moore . I have the following comments on the project and the project documents.

I'm impressed with the quality and completeness of both plans. The biggest fault I found from a CRM perspective is that it was a little confusing in the Draft Work Plan as to whether and when a Class III cultural resource inventory would be completed. I finally figured it out but this issue should be revisited and clarified in the document. The apparent plan to wait until a preferred alternate route is determined to conduct a Class III and then do it only on the preferred route is fine.

I have been coordinating Native American coordination with Richard and Simon. Dames & Moore sent the fact sheet to a number of tribal chairmen and tribal staff. I have told them that they need to follow-up with phone calls to verify receipt of the fact sheet and to inquire as to whether they wish to participate in the project review. BLM needs to now consult on a government-to-government basis. I will prepare a letter for the Field Managers signature to go to tribal chairmen and staff. I have Dames & Moore's mailing list. I will send the letter to those on that list plus any additional persons that are on our tribal mailing list. I will provide copies to Dames & Moore. I haven't decided yet whether to enclose detailed project information with the letters. I will probably just enclose the same fact sheet Dames & Moore used.

Greenlee to Huerfano 345KV
Transmission Line Project
Environmental Assessment
Huerfano Water & Electric
January 1999

FIRST CLASS MAIL

Scott Evans
BLM, Safford Field Office
711 14th Avenue
Safford, AZ 85546

ZHHPD

85546/3321



Greenlee to Huerfano 345KV
Transmission Line Project
Environmental Assessment
Huerfano Water & Electric
January 1999



Loren Panseeh Acting Director
Zuni Heritage & Historic Preservation Officer
Zuni Tribe
P.O. Box 339
Zuni NM 87327

87327/9339



COMMENT SHEET

Greenlee to Morenci 345kV
Transmission Line Project
Environmental Assessment
Morenci Water & Electric

It would be helpful for us to know what your thoughts and concerns are regarding this project. Please take a moment to complete the attached comment form and return it to us. Please return written comments by February 15, 1999.

Name: Heritage Program Director, WMA Tribe

Address: P.O. B 700 RECEIVED

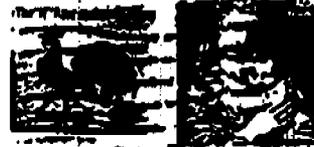
City, State: Whiteriver, AZ

Zip: 85941 U.S. POSTAL SERVICE FIELD OFFICE ARIZONA

The proposed project passes through Apache Ancestral lands that remain integral to the welfare and cultural vitality of Apache people and tribes. Apaches need and deserve far greater consideration than has been given them in the course of planning other federal undertakings associated with the Morenci area, which was once exclusively owned by Apaches. Apaches are the caretakers and stewards of the mountains, valleys, and rivers given to us by the Creator, and this proposal — like others motivated by greed and contempt for the Earth — ignores the Apaches responsibility. The project is, thus, misguided and should not go forward. There may be punishment for those involved in promoting the project and ignoring the Creator's sacred mandate to care for the Earth.

JANUARY 1999

Greene to Horenci 345KV
Transmission Line Project
Environmental Assessment
Horenci Water & Electric
January 1999



Scott Evans
BLM, Safford Field Office
711 14th Avenue
Safford, AZ 85546

Greene to Horenci 345KV
Transmission Line Project
Environmental Assessment
Horenci Water & Electric
January 1999



Raymond Kane Heritage Program Director
White Mountain Apache Tribe
Fort Apache Indian Reservation
P.O. Box 700
Whitewater AZ 85941

RECEIVED

JAN 11 1999

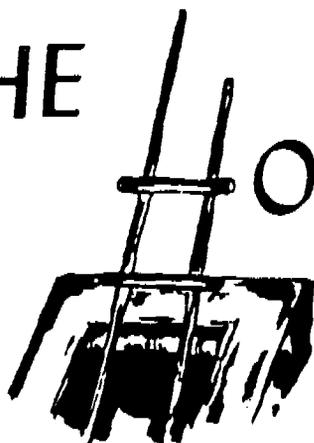
Apache Cultural Center
White Mountain Apache Tribe

I think you gave out the wrong email address on the fact sheet.
I'll try
your address without the .com

> From: Timothy Flood <tjflood@worldnet.att.net>
> To: sevens@az.blm.gov.com
> Co: swcbd@sw-center.org
> Subject: MW&E comments
> Date: Sunday, February 14, 1999 8:42 PM
>
> 2/14/1999
> Mr Scott Evans
> BLM, Safford Office
>
> re: Morenci Water and Electric proposed project
>
> I have read the Fact Sheet you sent Jan 8, 1999. I have a
number of
> concerns and questions about the project.
>
> 1) The purpose of the project needs further explanation.
Currently there
> already is a large power line or lines that cross the San
Francisco River
> south of Clifton. I would like to see a description of the
need for
> additional power in an area so far removed from the area of
active
mining.
>
> 2) I would not want to see the creation of an additional power
line
> crossing over the San Francisco River that would create a
visual
> disturbance to boaters on the river. One overhead crossing is
enough.
>
> 3) How does this project relate to the Morenci Land Exchange
that
recently
> was proposed? I do not recall any discussion in that exchange
and EA
that
> mentioned a need for increased power or powerlines.
>
> 4) I would want to see descriptions in the EA of the impact to
soils,
> runoff, water quality, and especially any resulting access to
the canyon
> and riverbed by ORVs.
>
> 5) The corridor where R1 and R2 are shown includes an area
where the

- > Arizona Rivers Coalition has proposed for inclusion into the national Wild and Scenic Rivers system. The Coalition's boundary for a recreational W&SR designation on the San Francisco River begins at the border of the public land, about 2.5 miles south of Clifton (see page 48 of Arizona Rivers: Lifeblood of the Desert, A Citizen's Proposal for the Protection of Rivers in Arizona, 3/11/1991). BLM would be wise to assure that the natural features of this segment are maintained.
- >
- > Please keep me posted of progress on this project.
- >
- > Thank you,
- >
- > Tim Flood
- > Conservation Coordinator
- > Friends of Arizona Rivers
- > 503 E Medlock Dr
- > Phoenix, AZ 85012-1512
- > ph 602-265-4325

THE



OPI TRIBE

Wayne Taylor, Jr.
CHAIRMAN

Phillip R. Quochoyewa, Sr.
VICE-CHAIRMAN

30 March 1999

Mr. Scott Evans
Bureau of Land Management
Safford Field Office
711 14th Avenue
Safford, Arizona 85546

RE: Proposed Greenlee to Morenci 345kV Transmission Line Project

Dear Mr. Evans,

The Hopi Tribe has received information regarding the proposed Greenlee to Morenci 345kV transmission line project and the associated preparation of an environmental assessment under the direction of the Safford Field Office of the Bureau of Land Management.

The proposed project area is located within an area that is of traditional cultural concern to the *Honngyam* (Bear Clan), *Piqösnngyam* (Bearstrap Clan), *Torsnngyam* (Bluebird Clan), *Awatngyam* (Bow Clan), *Tepnngyam* (Greasewood Clan), *Paaqapnngyam* (Reed Clan), *Hoongyam* (Arrow Clan), and *Poosiwnngyam* (Roadrunner Clan). As such, the Hopi Tribe, acting on behalf of these Hopi clans, requests full participation in the National Environmental Policy Act process to develop this environmental assessment, including the identification and assessment of resources that may be affected by this proposed project.

Should you have any questions or comments regarding the position of the Hopi Tribe please contact Mr. Leigh J. Kuwanwisiwma, Director, Cultural Preservation Office at 520/734-3751. Thank you for consulting with the Hopi Tribe

Sincerely,

Wayne Taylor, Jr.
Chairman and Chief Executive Officer
The Hopi Tribe

xc: Dr. Shelby Tisdale Dames and Moore
Cultural Preservation Office

COMMENT SHEET

Greenlee to Morenci 345kV
Transmission Line Project
Environmental Assessment
Morenci Water & Electric

It would be helpful for us to know what your thoughts and concerns are regarding this project. Please take a moment to complete the attached comment form and return it to us. Please return written comments by February 15, 1999.

Name: Brian Segee, Southwest Center for Biological Diversity

Address: P.O.B. 710

City, State: Tucson AZ 85702

Zip: Please keep us on mailing list.

January 1999

AUG-23-99 MON 01:58 PM

602 277 8693
MR PRINTER

FAX NO. 802 277 8693

P. 01



FRIENDS OF ARIZONA RIVERS

509 E Medlock Drive
Phoenix, AZ 85012-1812
602-266-4326
tjfood@worldnet.att.net

August 23, 1999

Scott Evans, Project Manager
BLM, Safford Field Office
711 14th Avenue
Safford, AZ 85546

Re: MW&E 345kV Inter-tie Project

Dear Mr Evans:

I have a few concerns about the proposed project.

1. Page 1-1. I had trouble following the logic behind the need for the project. The EA refers to "power outages," but fails to describe where in the power system these outages occur, how often, for how long, and the underlying problem behind the outages. For example, the proposed project would not accomplish its objective if the problems arise at the power generating source.
2. Page 2-2. Please help put the proposed 345 kV transmission line into perspective by adding a one-sentence description of the height and right of way of the existing 230kV support frames. How much larger would the proposed towers and line be?
3. Page 2-10. Thank you for clearly stating that no chemical treatment of vegetation will be required along the right of way.
4. Page 3-16. The section on noise fails to describe the annoying and disquieting arcing that can be heard up to 1/4 mile from high voltage lines. In my experience this buzzing and popping noise was very noticeable when I walked near and under such lines on the Agua Fria River and in Wildcat Canyon.
5. The maps do not show any human habitation along the proposed or alternative paths (except for the P-2 line through Table Top parcel, which would be a very bad idea). Is the reader to assume there are no habitations?

The public continues to express concerns about the potential health effects of EMF exposure. Most public health officials recommend "prudent avoidance" when it comes to exposure to EMF. In this case, this would imply that the new lines be sited a sufficient distance away from homes to avoid any such concerns now or in the future. I urge that any lines be located a sufficient distance from occupied buildings so that they cannot be heard by the public.

AUG-23-99 MON 01:59 PM

MR PRINTER

FAX NO. 602 277 8693

P. 02

6. Page 4-9. Power lines injure birds, especially raptors, when they fly into the lines or supporting towers. Please see the following url http://www.hcn.org/1998/dec07/dir/Western_Power_pole.html (JT Thomas, "Power poles make deadly perches." *High Country News*. 1998;30(23)). I would imagine that this would be a greater problem in proximity to the San Francisco River corridor, where many of the larger birds would concentrate during migrations. The Gila Box is home to the rare blackhawk, and it is important that this species be protected.

The EA is deficient in not describing previously conducted surveys of raptor mortality due to power lines. What can one reasonably expect from the proposed project? The EA also should describe what steps can and will be taken to minimize this significant impact.

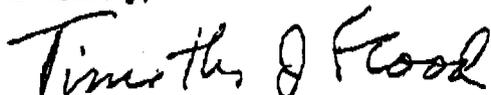
7. The description of visual impacts missed the point I made in my scoping comments. When navigating on the San Francisco River, or traveling in the river corridor, I find the existing power lines are a definite unsightly distraction. The photographic angle at Location #7 (taken from the top of the cliff) fails to show how disruptive the existing 230kV lines are to the scenic quality.

The EA needs to more fully explore the option of reducing the visual impacts at the river crossing, whichever route is chosen. Specifically, I am looking for a discussion of burying the old and proposed lines at the R1 crossing so they are not visible at all from the river. This would solve two problems – scenery and danger to hawks.

8. Page 4-13, top. Could BLM please state how they propose to close the maintenance roads to prevent public vehicular access to the river bottom?
9. Pages B-1 to B-3. The list of standard and selective mitigation measures appear to employ best management practices. This is good.

Finally, assuming you can satisfactorily address the points above, I agree with the "Alice's Restaurant mentality" on the choice of the proposed alternative: one big pile is better than two. So, I prefer that you run the 230kV and 345kV lines next to each other as you have proposed.

Sincerely,



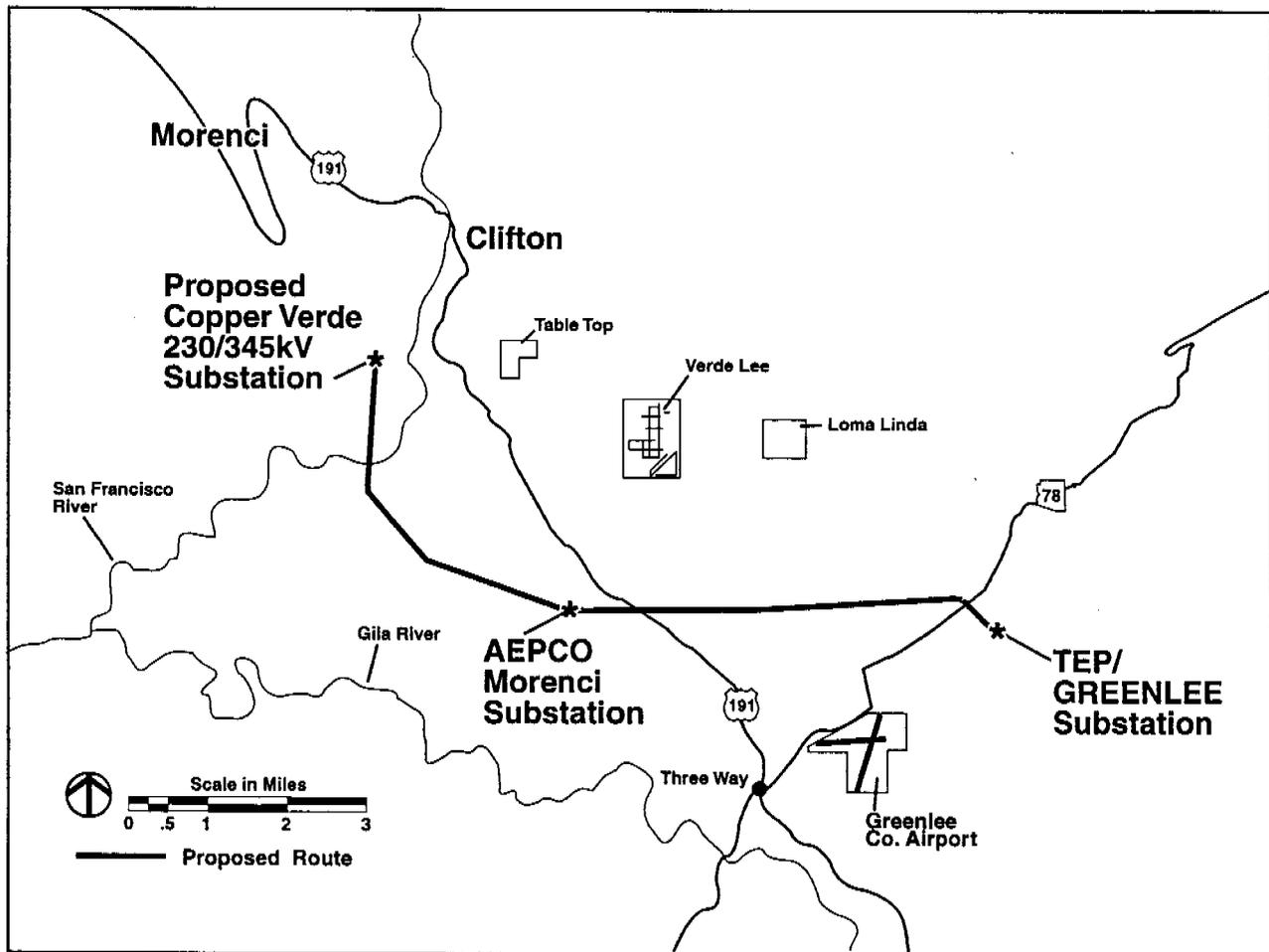
Timothy J. Flood

**EXHIBIT J-2
PUBLIC NOTICES**

PUBLIC NOTICE

The Bureau of Land Management, Safford Field Office, has prepared a draft environmental assessment (EA) for a proposed 345kV transmission line right-of-way from the TEP Greenlee Substation to the proposed Copper Verde Substation south of Morenci, Arizona (approximately 11 miles). Copies of the draft EA are located at the Clifton and Safford libraries for public review.

Comments on the EA must be submitted in writing and must specifically address the EA. For your comments to be considered, they must be postmarked no later than August 24, 1999. Please send your comments to the attention of the project manager, Scott Evans, Bureau of Land Management, Safford Field Office at 711 14th Avenue, Safford, Arizona 85546. You may also contact him for additional information at (520) 348-4414.



Morenci Water and Electric 345kV Intertie Project

BLM Open House to Address Proposed Transmission Line

The Bureau of Land Management (BLM) Safford Field Office will conduct an open house to inform and receive comments from the public about an environmental assessment (EA) to address the development of a proposed 345,000-volt transmission line. Morenci Water & Electric (MW&E) proposes to construct a 14-mile transmission line from the Tucson Electric Power Greenlee Substation to Morenci, Arizona. MW&E is requesting public input at this early stage of the EA process to identify potential issues and concerns.

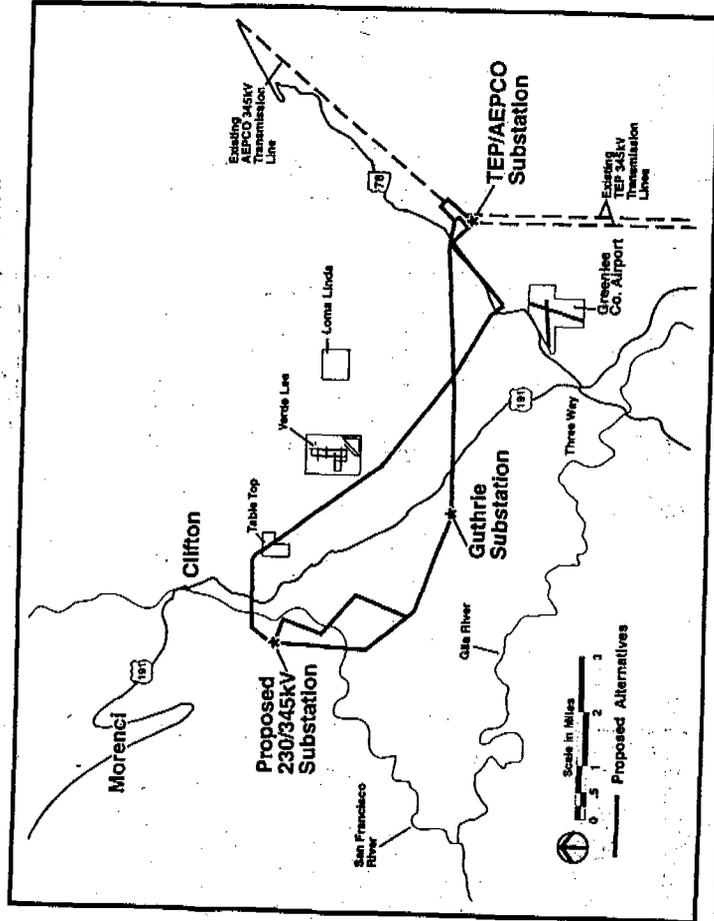
The EA process will address public and agency concerns; identify potential environmental impacts of development on natural, human and cultural resources; and assess and compare alternatives to and for the transmission line.

The open house will be held in Clifton on January 28, 1999 at the Clifton High School Cafeteria, 110 High Street, 4:30 to 7:30 pm. The open house will be informal for the public to review project displays and discuss the process individually with project team members.

Written comments will be accepted until February 15, 1999.

Mail comments to: Bureau of Land Management
Safford Field Office
711 South 14th Avenue
Safford, Arizona 85546.

If you have any questions about the open house, please call Scott Evans at (520) 348-4414.



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Wednesday, January 27, 1999 - THE COPPER ERA - Clifton, Arizona - Page 3

Page 4 - THE COPPER ERA - Clifton, Arizona - Wednesday, January 20, 1999

**EXHIBIT J-3
FACT SHEET**

FACT SHEET

Morenci Water & Electric

Project Description

The Bureau of Land Management (BLM) Safford Field Office will be directing the preparation of a third-party environmental assessment (EA) in compliance with the National Environmental Policy Act (NEPA) to analyze the potential impacts related to the construction and operation of the proposed Greenlee to Morenci 345kV Transmission Line Project. Morenci Water & Electric (MW&E) is proposing to build and operate approximately 14 miles of 345 kilovolt (kV) transmission line from Greenlee Substation (east of Three Way) to Morenci, Arizona. The proposed transmission line structure is a wooden H-Frame structure, typically 75 to 80 feet above ground, spaced 700 to 1,000 feet apart. The project would improve transmission line reliability to MW&E customers and maintain competitive pricing for electric power.

Appropriate federal, state, county, and local agencies and public interest groups will be contacted and consulted throughout the EA process. The objectives of the EA and related activities will be to study and assess the potential impacts of the proposed project on various environmental resources including biological (e.g., threatened or endangered species), cultural, visual, land use, socio-economic, geology, soils, and water.

The accompanying map shows the proposed project study area and the alternatives selected for further evaluation.

Public Participation and Environmental Analysis Process

The process of conducting environmental and engineering studies to identify a suitable location for the project is ongoing. Studies are being conducted in cooperation with the BLM to determine the location of corridors suitable for this type of use. Alternative transmission line corridors have been identified. The BLM is seeking comments on the alternatives from the public, federal, state, and local agencies, and potentially affected landowners for this project.

The EA will be prepared by Dames & Moore, an environmental consulting firm, under the direction of the BLM. Environmental and engineering studies are currently being conducted to identify and evaluate the proposed project alternatives including a "no-action" alternative.

The purpose of this fact sheet is to give you an opportunity, early in the process, to comment on the proposed project. Comments must be received by February 15, 1999. A self-addressed comment form is included with this fact sheet to provide any comments you have on the project.

In addition to this fact sheet, a public open house is being held to discuss the proposed project and EA. This meeting will be held at the following time and location:

January 28, 1999
4:30 to 7:30 p.m.
Clifton High School
(Cafeteria)

We look forward to your comments. If you need additional information or if you have questions concerning the project, please contact:

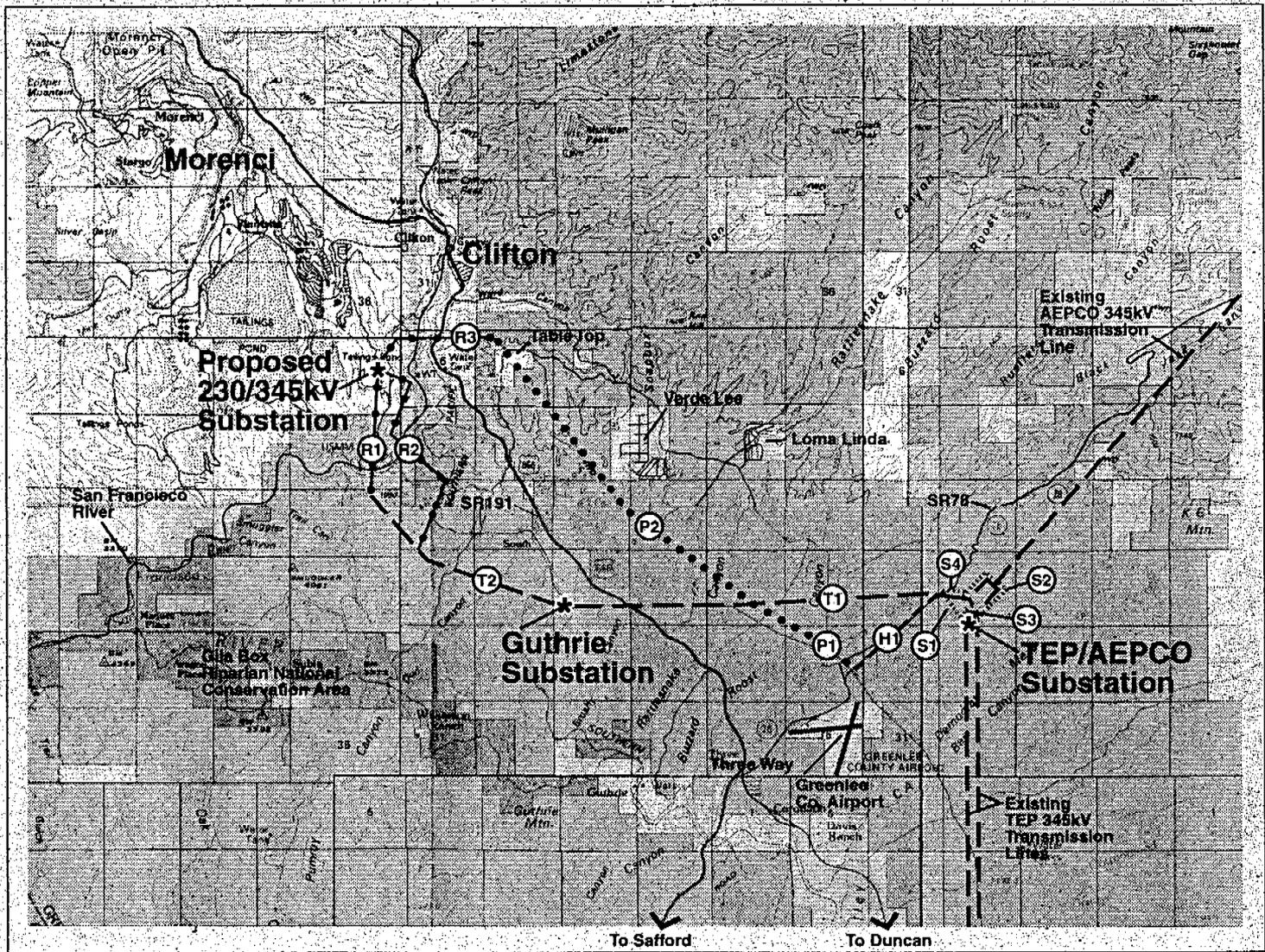
Scott Evans
Bureau of Land Management
Safford Field Office
(520) 348-4414
E-mail: sevans@az.blm.gov

or

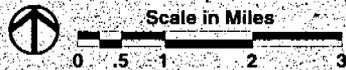
Richard Knox
Dames & Moore
Phoenix
(602) 371-1110

Personas quien hablan español se pueden poner en contacto con Scott Evans a BLM
(520) 348-4414
E-mail: sevans@az.blm.gov

January 1999



Dames & Moore
January 1999



Vicinity and Alternatives Map

Greenlee to Morenci 345kV
Transmission Line Project
Environmental Assessment
Morenci Water & Electric

Key

- — — Existing 230kV alignment
- Existing natural gas pipeline alignment
- San Francisco River crossing alternatives
- TEP/AEP/CO substation alternatives

**Greenlee to Morenci 345kV
Transmission Line Project
Environmental Assessment
Morenci Water & Electric
January 1999**

Place
Postage
Here

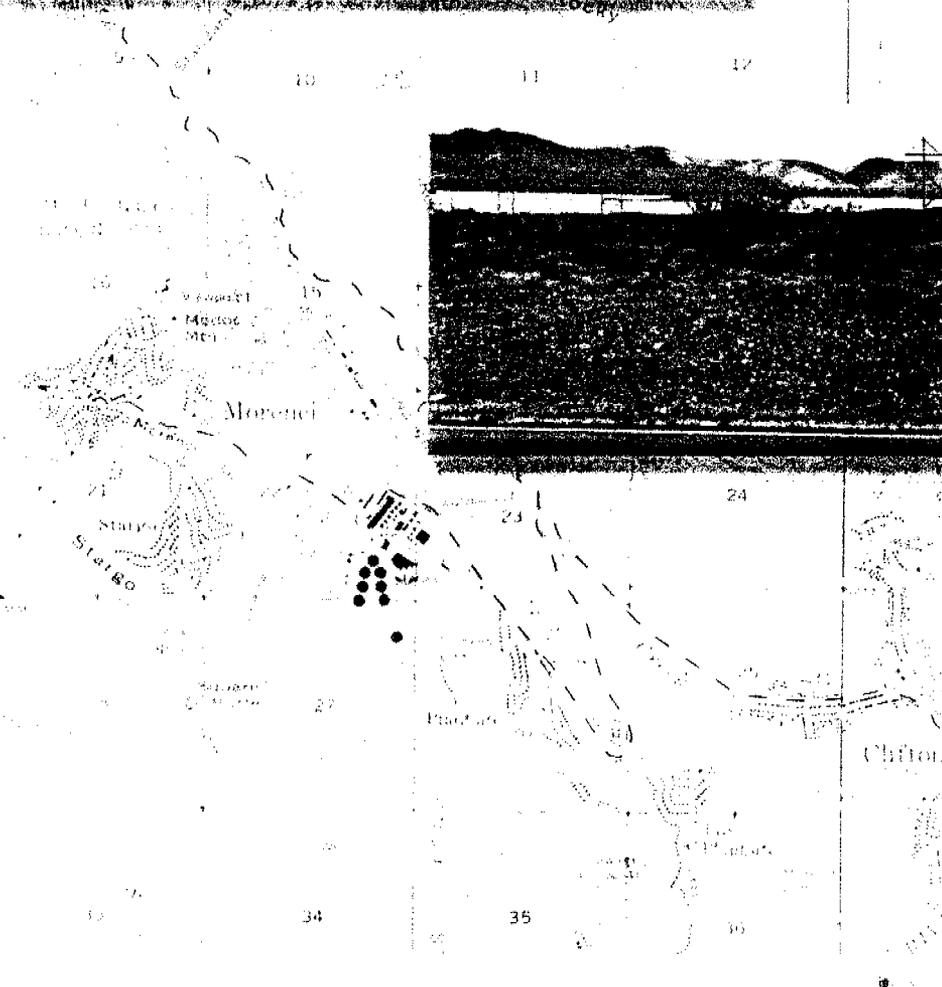
Scott Evans
BLM, Safford Field Office
711 14th Avenue
Safford, AZ 85546

**Greenlee to Morenci 345kV
Transmission Line Project
Environmental Assessment
Morenci Water & Electric
January 1999**

ENVIRONMENTAL ASSESSMENT

for the

Morenci Water & Electric 345kV Intertie Project



Prepared for



Bureau
of Land
Management

Safford Field Office

Prepared by



DAMES & MOORE

A DAMES & MOORE GROUP COMPANY

OCTOBER 1999

Exhibit B-2

**MW&E 345kV INTERTIE PROJECT
ENVIRONMENTAL ASSESSMENT**

Right-of-Way Serial No. AZA 30869

Environmental Assessment No. AZ-040-99-11

Prepared for

**Bureau of Land Management
Safford Field Office**

Prepared by

Dames & Moore

July 19, 1999

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LIST OF ACRONYMS

ADOT	Arizona Department of Transportation
ADWR	Arizona Department of Water Resources
AEPCO	Arizona Electric Power Cooperative, Inc.
AGFD	Arizona Game and Fish Department
ASLD	Arizona State Land Department
BLM	Bureau of Land Management
DES	Arizona Department of Economic Security
DSM	Demand Side Management
EA	environmental assessment
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FLPMA	Federal Land Policy and Management Act
FWS	U.S. Fish and Wildlife Service
KOP	Key Observation Points
kV	kilovolt
MW	megawatt
MW&E	Morenci Water and Electric Company
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
PDMI	Phelps Dodge Morenci, Inc.
RNCA	Riparian National Conservation Area
ROS	Recreation Opportunity Spectrum
SHPO	State Historic Preservation Office
SR	State Route
SQRU	Scenic Quality Rating Unit
TEP	Tucson Electric Power
VRM	Visual Resource Management

CHAPTER 1 - INTRODUCTION

BACKGROUND

Morenci Water and Electric Company (MW&E) has requested a right-of-way grant (SF 299) from the Bureau of Land Management (BLM) for the construction, operation, and maintenance of a 345 kilovolt (kV) transmission line from the Tucson Electric Power (TEP) Greenlee Substation east of Clifton, Arizona to the proposed Phelps Dodge Morenci, Inc.(PDMI) Copper Verde Substation that would be located south of Morenci (Figure 1). An in-service operating date of 2000 has been proposed for the 345kV intertie project. After an evaluation of several possible sources of additional electrical capacity (as described in Chapter 2), MW&E determined that a 345kV transmission line from the TEP Greenlee Substation to Morenci (approximately 12 miles) would best meet the purpose and need of the proposed action.

PURPOSE AND NEED FOR THE PROPOSED ACTION

MW&E serves electricity to its customers in the Morenci and Clifton areas, including PDMI. To supply its customers with electricity, MW&E purchases power from electricity suppliers within the western United States, including the Arizona Electric Power Cooperative, Inc. (AEPSCO). The power purchases are delivered to MW&E customers using the extra-high voltage interconnected transmission grid, the AEPSCO transmission system, and a single 230kV transmission line connecting AEPSCO's transmission system to MW&E.

MW&E is proposing the 345kV intertie project as a reinforcement for the existing AEPSCO transmission system to meet the need for both increased load serving capability and increased reliability. Over the last several years the electrical load for MW&E customers has grown from 170 megawatts (MW) in 1993 to the current 220 MW. This increase in electrical load is based in part on the shift of PDMI's mining production methods. These methods are more sensitive to power outages than in the past. Increasing the reliability of the transmission system is necessary to minimize the loss of costly downtime in mining production that results from a power outage. AEPSCO currently provides 135 MW to MW&E through firm (or non-interruptible) power contracts and 85 MW (from 135 MW to 220 MW) to MW&E through non-firm (or interruptible) power contracts.

The proposed action would accomplish the following:

- provide the additional 85 MW (from 135 MW to 220 MW) of firm transmission capability needed to satisfy MW&E's current electrical load
- reinforce the transmission delivery system to provide reliable and increased load serving capability to support continuing load growth at PDMI

- increase the reliability of the MW&E electrical system by creating a looped transmission system to provide a second transmission path to supply MW&E customers with power during system outages
- provide supplemental access to the western United States' interconnected electrical grid to allow MW&E to purchase power and optimize the terms of its power purchase agreements
- provide for de-energized maintenance of the existing AEPCO 230kV facilities, resulting in additional operating flexibility, increased maintenance efficiency, lower overall operating costs, and enhanced worker safety
- provide for compliance with Western Systems Coordinating Council reliability criteria with regard to single contingency outages and maintenance of service to customers during system outages

CONFORMANCE WITH RESOURCE MANAGEMENT PLANS

The BLM, Safford Field Office is the lead federal agency for this environmental assessment (EA). The proposed transmission line is consistent with the management direction and multiple use management framework described in the Safford District Resource Management Plan (1991), as amended (1994).

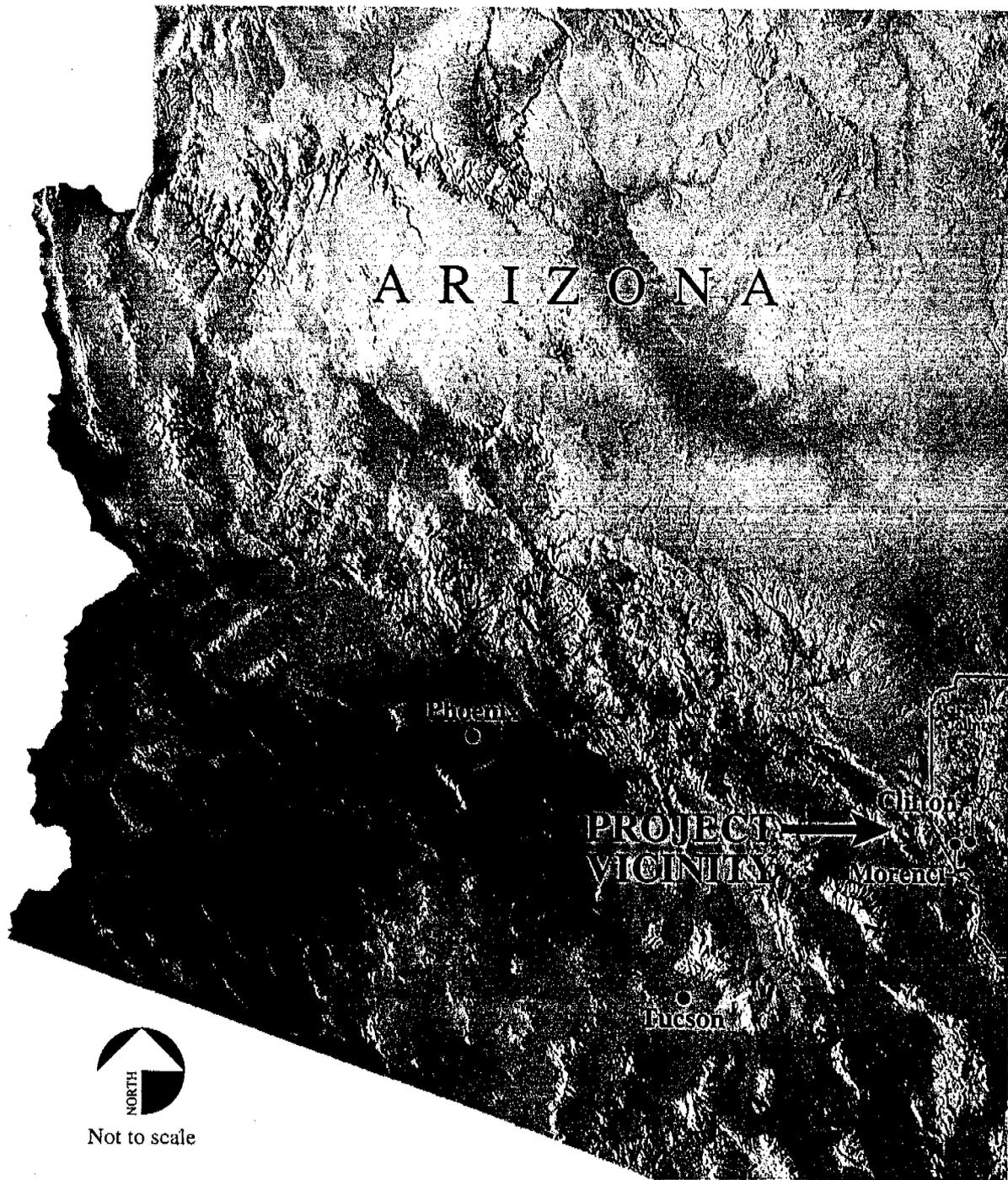
RELATIONSHIP TO STATUTES, REGULATIONS, AND OTHER PLANS

This EA documents the affected environment and the potential environmental consequences of the proposed action. The EA has been prepared in compliance with the National Environmental Policy Act (NEPA), Council on Environmental Quality Implementation Procedures outlined in Part 40 of the Code of Federal Regulations, the BLM Arizona Environmental Handbook (BLM 1991), and the BLM NEPA Handbook (BLM 1988). Additionally, environmental planning, consultation, and impact assessment processes have been conducted to comply with applicable policies and programs of federal, state, and local agencies.

PLANNING ISSUES

Scoping and Public Involvement

Various federal, state, county, tribal, and local agencies were contacted for information and comments on the proposed action. A public open house was conducted to request public comments



REGIONAL MAP
Morenci Water & Electric 345kV Intertie Project

July 1999

Figure 1

and suggestions regarding the proposed action. The public scoping process identified issues and concerns that were analyzed and are addressed in this EA.

A fact sheet was distributed on January 8, 1999 to those on a BLM mailing list including various agencies and the public. The newsletter described the proposed action and provided information on the time, location, and purpose of the public meeting. The proposed action and public meeting also were announced in the *Copper Era* (January 20 and 27, 1999) and the *Eastern Arizona Courier* (January 20 and 27, 1999).

The public open house took place on January 28, 1999 from 4:30 to 7:30 p.m. at Clifton High School in Clifton, Arizona. The meeting was attended by five individuals. In addition, representatives of the BLM, MW&E, and Dames & Moore were present. Information regarding the purpose and need; description of the proposed action, including an in-service date for implementation; preliminary alternatives to be studied; details on the environmental studies to be conducted; and project schedule was provided. Comment forms also were available at the public meeting to provide an opportunity for the attendees to review project details and submit comments at or after the meeting. Copies of the fact sheet, comment form, and public announcement are located in Appendix A.

Key Issues

Comments received during scoping were evaluated to identify key issues. The issues raised during the scoping process focused on land use (access) as it relates to increased soil erosion, visual resources, cultural resources, and need for the project.

Public comments that were received are summarized below in Table 1.

Topic	Issues/Comments
Land use (access) as it relates to soil erosion potential	<ul style="list-style-type: none"> ■ What will the effects of new access be at the San Francisco River crossing on runoff and water quality?
Visual resources	<ul style="list-style-type: none"> ■ An additional line at the San Francisco River crossing would impact recreational users of the river. ■ Alternative river crossings R1 and R2 cross segments of the San Francisco River that the Arizona's River Coalition has proposed for a Scenic and Wild River designation.
Cultural resources	<ul style="list-style-type: none"> ■ Native American concerns for impacts to prehistoric cultural properties should be considered.
Need for project	<ul style="list-style-type: none"> ■ How does the project relate to the Morenci land exchange? ■ Further explanation of the need for additional power in the area.

DECISION TO BE MADE

The Safford Field Office manager for the BLM is responsible for the decision to be made regarding this project under the guidelines of NEPA. The decision to be made is whether or not the proposed action should be constructed and a right-of-way easement granted on BLM land as proposed, not at all, or to some other extent. Elements of the decision to be made include the following:

- selection of a preferred alternative which could include the no-action alternative
- whether or not the proposed action has a significant impact on BLM resources
- what, if any, mitigation can be applied to reduce impacts to acceptable levels
- whether or not a Title V Federal Land Policy and Management Act (FLPMA) grant should be issued authorizing the proposed action

The primary legal basis for granting easements across BLM lands is the FLPMA of 1976 (43 U.S.C. 1715). Under FLPMA, the Secretary of the Interior, in this case, is authorized to grant, issue, or renew rights-of-way over, upon, or through such lands for utility corridors, roads, trails, highways, railroads, canals, etc. Issuance of permits, leases, and easements under FLPMA is guided by the regulations of 36 CFR 251. Easements are granted across BLM lands when the need for such is consistent with planned uses.

STUDY APPROACH

The study approach for the proposed action included environmental studies and public involvement activities conducted from December 1998 through May 1999. This approach was designed to identify, evaluate, and compare proposed and alternative transmission line routes based on environmental analysis, and agency and public input.

The study approach involved a systematic process, which included several phases. The first phase was the determination of a project study area for the proposed action. The study area was defined to ensure that all "reasonable" and "feasible" routes could be studied. The project study area (approximately 45,000 acres in size) is located in southeastern Arizona in Greenlee County and includes BLM, Arizona State Land Department (ASLD), and private lands.

In the second phase of the project, a regional inventory of various resources was conducted to identify fatal flaws or constraints that would affect the siting of the proposed action. The resources studied included natural, human, and cultural environments. This information was used to determine broad siting corridors for the location of the transmission line. Approximately 45 miles of preliminary alternative routes were identified, and reviewed by the public.

In the third and final phase, impact assessment, mitigation planning, and the comparison and ranking of the preliminary alternative routes were conducted. The preliminary alternatives were assessed for potential initial environmental impacts. Mitigation measures were applied to these initial impacts and the resulting residual impacts were used as a basis for the comparison and ranking of the routes.

CHAPTER 2 - DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

Chapter 2 describes the development, consideration, and in some cases, elimination of alternatives for the proposed action. The no-action alternative is described initially, followed by a description of the proposed action and alternatives. A detailed description of the facilities and associated pre-construction, construction, and maintenance activities is then provided followed by an explanation of alternatives that were considered but eliminated.

A variety of alternatives were identified early in the process, some of which were carried forward and some of which were eliminated. The preliminary alternative routes, including those eliminated based on engineering constraints or environmental concerns, are shown on Figure 2.

NO-ACTION ALTERNATIVE

Under this alternative, the right-of-way application (SF 299) would not be approved by the BLM and the 345kV transmission line would not be built resulting in the loss of an economical and reliable power source.

PROPOSED ACTION AND ALTERNATIVES CONSIDERED

For the proposed action the BLM would issue to MW&E a right-of way grant to construct, operate, and maintain a 345kV transmission line from TEP Greenlee Substation to the proposed site of the PDMI Copper Verde Substation. In most cases, right-of-way width will not exceed 150 feet. The actual right-of-way width throughout the entire length of the route will vary depending on design characteristics or other constraints. The proposed right-of way requested ranges from approximately 11 to 12 miles depending on the route selected.

The identification of the proposed and alternative routes included the combining of localized substation routes into alternative routes. This task began with an evaluation of subsets of local routes. Based on the results of local route comparisons, alternatives were combined to determine the best overall routes for final comparison. Alternatives were grouped into route subsets based on geographical locations and system requirements. The three route subsets include alternatives associated with the substation, cross-country, and San Francisco River areas. Alternative routes were compared within each group and ranked on a resource by resource basis. The rankings developed for each resource were evaluated to establish the best route within each subset. The resulting proposed and alternative routes shown on Figure 3 were then compared to establish the overall ranking or preference of each route based on impacts to land use, visual, cultural, biological, and earth resources. Mitigation measures, as described in Appendix B, will be implemented throughout the project in order to reduce potential adverse environmental impacts. Most of the impacts are short

term and generally occur during the construction period. Project design and implementation of site-specific or selectively recommended mitigation measures will minimize the effect of the project where possible long-term adverse impacts may occur. Table 2 is an overall environmental summary of the comparison and ranking for the proposed and alternative routes.

Proposed Route – TEP1 (Link S1), A1 (Links T1, T2, T3, and T4), River 1 (Link R1)

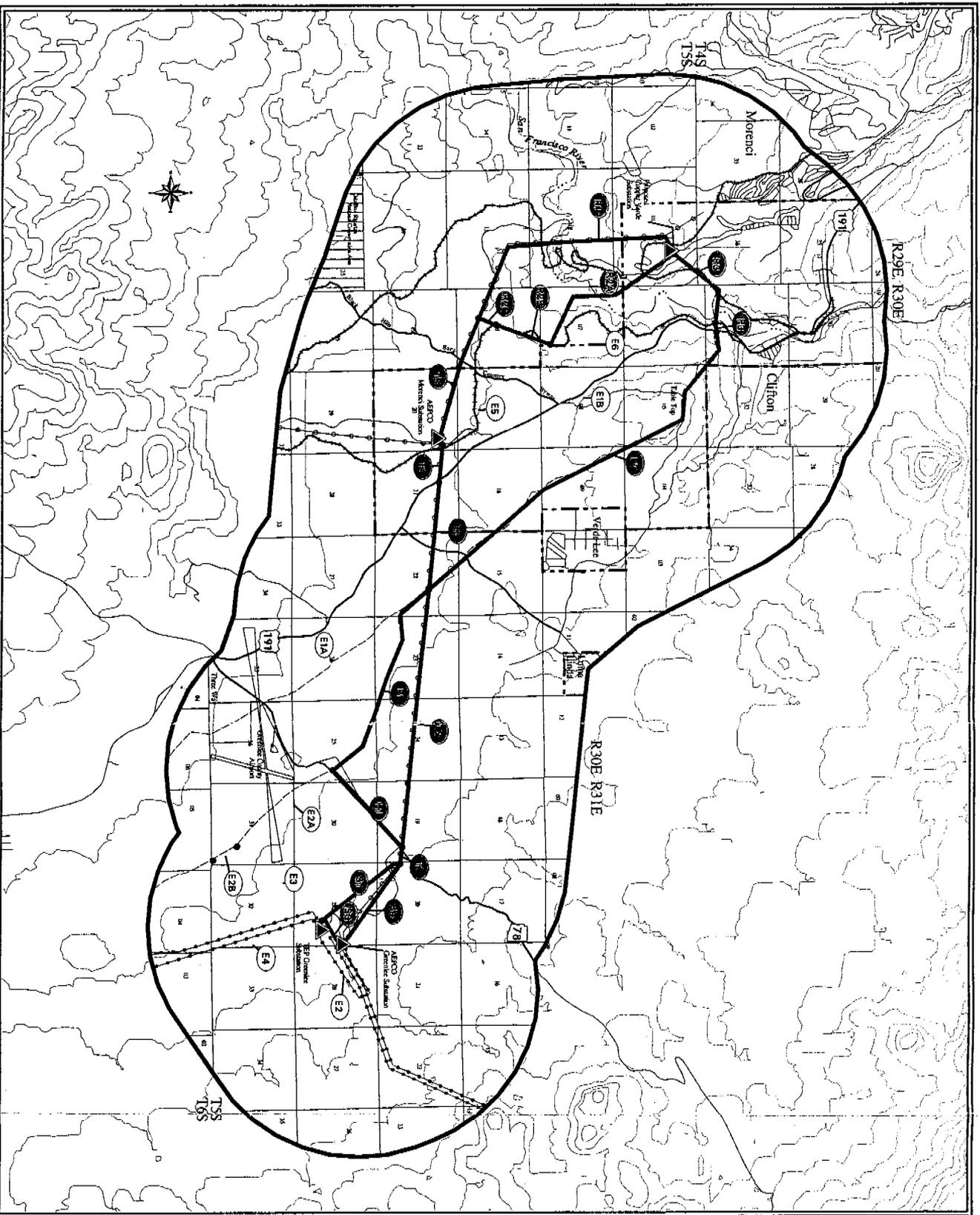
The proposed route would parallel AEPCO's existing 230kV transmission line from TEP Greenlee Substation to the proposed site of PDMI's Copper Verde Substation for approximately 90 percent of its overall length. This route would cross the San Francisco River on BLM land. The overall length of the route is approximately 11 miles. The proposed route combines alternatives in the substation, cross-country, and San Francisco River areas. These alternatives are discussed in terms of the links that make up the overall proposed route (Links S1, T1, T2, T3, T4, and R1) in Chapters 3 and 4.

Alternative Routes - TEP3 (Links S3 and S4), A3 (Links T1, T2, P2), A4 (Links T1, P1, and P2), River 3 (Link R3), and River 2 (Link R2)

Alternative routes would parallel SR 78, AEPCO's 230kV transmission line, or an El Paso Natural Gas pipeline for portions of their lengths. These routes would span the San Francisco River within the incorporated limits of Clifton or on BLM administered land. The alternative routes combine alternatives in the substation, cross-country, and San Francisco River areas. These alternatives are discussed in terms of the links that make up the overall alternative routes (Links S2, S3, T1, T2, P1, P2, R3, and R2) in Chapters 3 and 4.

Facilities Description

The structures being considered for this project are self-weathering steel "H" frame designs as shown on Figures 4 and 5. Typically, the structures would be approximately 100 to 130 feet above ground, spaced approximately 900 feet apart, and sited adjacent to AEPCO's 230kV structures, where practical. Structure foundations would consist of augered holes 7 to 14 feet deep with the foundations of the structure embedded directly in the ground. Final design characteristics will be determined in the detailed design phase of the project.



Preliminary Alternative Transmission Line Routes
Morenci Water & Electric 345kV Inter tie Project

- Alternative Routes
- ⊖ Alternative Routes Eliminated
- Link Identifier for Routes
- ⊖ Link Identifier for Routes Eliminated
- Link Node

General Reference Features

- ▲ Power Substation
- ▴ Proposed Substation - Final Approval
- ▭ Gila Box Riparian National Conservation Area
- 345kV Transmission Line
- 230kV Transmission Line
- Pipeline
- Community Boundaries
- Primary Transportation Routes
- Secondary Transportation Routes
- ++++ Railroads
- Study Area Boundary

Scale in Miles



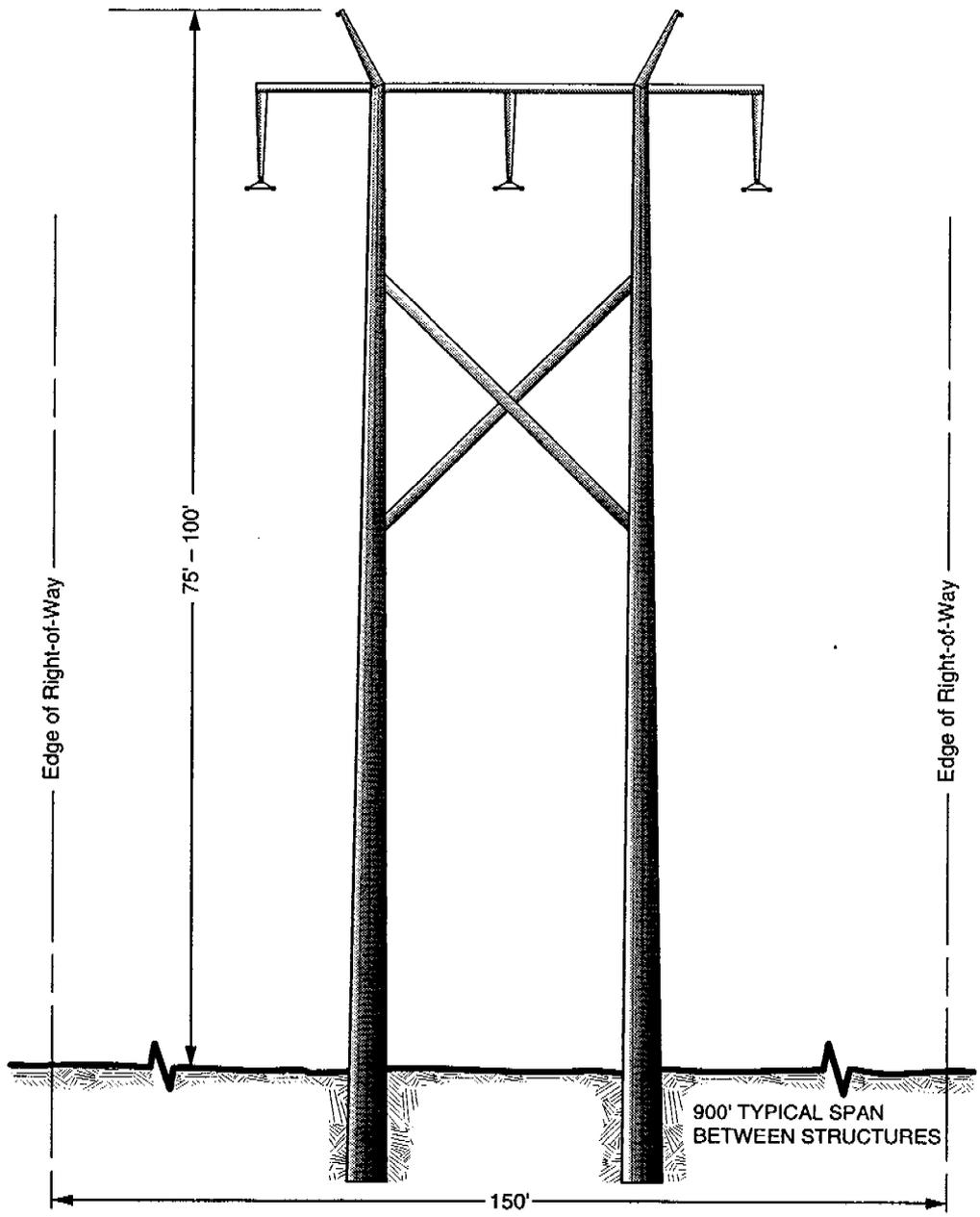
Figure 2

Table 2 - Proposed and Alternative Routes- Environmental Ranking Summary

Proposed and Alternative Routes	Length (miles)	Environmental Resources										Environmental Ranking
		Earth and Water Resources	Biology	Land Use	Visual Resources		Cultural Resources	Issues				
					Sensitive Viewers	Scenic Quality						
Substation Routes												
Proposed Route												
TEP 1 (Link S1)	1.19	1	1	1	1	1	1	1	1	1	1	1
Alternative Route												
TEP 3 (Links S3, S4)	1.54	2	1	1	1	1	1	1	1	1	2	2
Cross-Country Routes												
Proposed Route												
A1 (Links T1, T2, T3, T4)	4.65	1	1	1	1	1	1	2	2	2	1	1
Alternative Routes												
A3 (Links T1, T2, T3)	2.18	2	2	2	2	2	2	2	2	2	2	2
A4 (Links T1, P1, P2)	2.1	2	2	2	3	3	3	1	1	1	3	3
San Francisco River Routes												
Proposed Route												
River 1 (Link R1)	3.85	1	1	1	1	1	1	1	1	1	1	1
Alternative Routes												
River 2 (Link R2)	2.88	3	3	3	3	3	3	1	1	1	3	3
River 3 (Link R3)	1.1	2	2	2	2	2	2	1	1	1	2	2

Level of Environmental Compatibility	1	2	3
Highest	1	2	3
Lowest	3	2	1

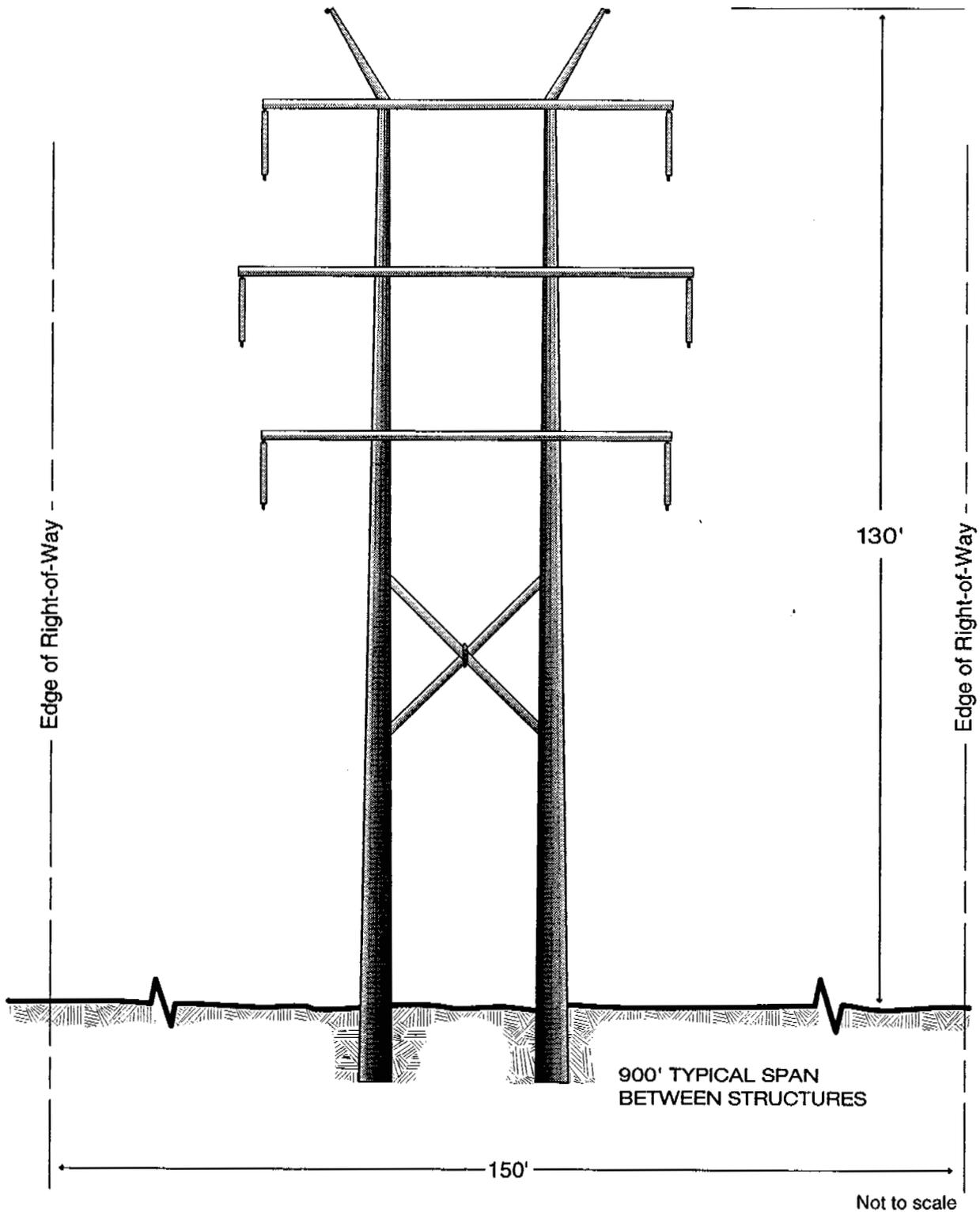
TABLE 2



Not to scale

Typical Self-Weathering Steel Structure
 Morenci Water & Electric 345kV Intertie Project

Figure 4



Typical Self-Weathering Steel Structure
Morenci Water & Electric 345kV Intertie Project
Figure 5

July 1999

The transmission line will be designed for one 345kV three-phase circuit and two static wires. Each of the phases will consist of two 1.1-inch-diameter aluminum conductors. One or two of the static wires will be a ½-inch-diameter OPGW (fiber optic ground wire) containing optical fibers for the purpose of project communications and control. If only one OPGW is needed, the other static wire will be a 3/8-inch extra-high strength steel wire. The number of static wires with OPGW will be determined during the detail design of the proposed project.

A description of the pre-construction, construction, and maintenance activities is provided below.

Project Pre-Construction, Construction, and Maintenance Activities

Pre-Construction Activities

During the preconstruction phase, a specific plan of development will be approved by the BLM to include site-specific measures for the selected route. The plan of development will include a native plant clearance survey, salvage plan, cultural resources survey and mitigation, and compliance plan.

Cultural Resource Surveys

BLM and ASLD permitted contractors will survey the selected route prior to construction for cultural resources. Any cultural property that will be directly or indirectly impacted will be subject to evaluation and determination through BLM and ASLD stipulations. Project engineers will work with the archaeologists to avoid or minimize impacts to any identified cultural resources by relocating structures where feasible.

Biological Surveys

Biological surveys for wildlife and plant species along the selected route will be conducted prior to construction. Consultation may occur with Arizona Game & Fish Department (AGFD), U.S. Fish and Wildlife Service (FWS), and ASLD.

Engineering Surveys

Before construction surveying begins, required permits to survey on federal and state lands or right-of-way entry for privately owned land will be obtained. Construction survey work will consist of centerline location, structure center hub, right-of-way boundaries, and structure access.

Construction Activities

Access Road Construction

Transmission line construction requires the movement of large vehicles along the right-of-way. Where new access roads are required, they will be constructed to support the weight of these vehicles.

Unpaved access roads will be required for the construction, operation, and maintenance of the proposed transmission line. Existing roads will be used when the right-of-way closely parallels a utility corridor or where other existing roads provide adequate access to the line. Where existing roads can be used, only spur roads to the tower sites will be required. Main and spur access roads will be constructed on the right-of-way where existing roads are not present. If adverse conditions exist, such as the need to avoid sensitive resources, difficult topography, or landowner requirements, the access roads may have to be located outside of the right-of-way.

Wherever possible, roads will be built at right angles to streams and washes. Culverts will be installed where necessary. In addition, road construction will include dust-control measures (i.e., watering roads and mulching exposed soil) 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 applicants' requirements for transmission line access roads. At the San Francisco River crossing, existing access roads will be used where practical. New access roads needed at the crossing will be approved by the BLM.

Structure Site Clearing and Restoration

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 by 100 feet. At each site, a work area of approximately 5,000 square feet will be required for the lay down of structures, assembly, and erection of the structures, and safe operation of the cranes and other construction equipment. The vegetation in the work area will be trampled, not cleared, unless approved by the BLM. After transmission line construction, all areas not needed for normal 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 may be required; however, selective clearing will be performed only when necessary to provide for surveying, electrical clearance, transmission 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 standards.

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

Foundation Installation

Excavations for setting the structures are made with power equipment. Where the soil permits, a vehicle-mounted power auger or backhoe is used. In rocky areas, the foundation holes may be excavated by drilling and blasting. Blasting requires drilling holes in the area to be excavated. Conventional or plastic explosives will be used. Safeguards such as blasting mats will be used when needed to protect the adjacent property. After the holes are augured, structures will be set, backfilled, and tamped. The foundation excavation and installation will require access to the site by power auger, crane, and material hauling trucks.

Construction Yards

A temporary construction yard will be located on BLM land near the center of the right-of-way.

Structure Assembly and Erection

Structures and associated hardware are shipped to each structure site by truck. Structure assembly and mounting of associated transmission line hardware takes place at each site. The assembled structure is then raised and placed in pre-dug holes.

Conductor Installation

The structures are erected with insulators, hardware, and stringing sheaves attached. 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 structures placed on either side of an obstacle. These structures prevent ground wire, conductors, or equipment from falling on or contacting obstacles. Equipment for erecting guard structures includes augers, line trucks, structure 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 conventional wire stringing methods. A larger diameter, stronger "pulling" line is then attached to the pilot line and strung. The conductor or ground wire is then pulled in using the pulling line. This process is repeated until the ground wires or conductors are 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.

The tensioning site is an area approximately 150 feet by 60 feet. Tensioners, line trucks, wire trailers, and tractors, which are needed for stringing and anchoring the ground wire or conductor, are located at this site. The tensioner, along with the puller, maintains tension on the ground wire or conductor. Maintaining tension maintains ground clearance and is necessary to avoid contact with energized wires or damage to the ground wire, conductor, or any objects below them during the stringing operation.

The pulling site requires two-thirds the area of the tension site. A puller, line trucks, and tractors which are needed for pulling and temporarily anchoring the ground wire and conductor 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, ASLD, or private 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 by regrading the road to its original contour and revegetating the disturbed area. Salvaged native plants will be used for revegetation, if appropriate, along with seeding using a BLM-recommended seed mixes.

Preferably, seed will be planted during the months from November to January following transmission line construction. Seed will be planted using hand broadcasting, drilling, straw mulching, or hydromulching as directed by BLM.

Maintenance

Maintenance of the proposed action would occur yearly with either helicopter or vehicle inspections. A detailed inspection every 10 years is projected that may include climbing each structure.

ALTERNATIVES CONSIDERED BUT ELIMINATED

Other transmission system options were considered as alternatives to the proposed action. They are (1) conservation and demand-side management, (2) generation, (3) 230kV transmission line, (4) interconnecting at an alternative 345kV substation site, and (5) undergrounding the 345kV transmission line. These alternatives are discussed below.

Conservation and Demand-Side Management

Energy efficiency (or energy conservation) is primarily achieved through programs that reduce overall energy consumption of specific end use devices and systems by promoting high-efficiency equipment and building design. Energy-efficiency programs typically reduce energy consumption over many hours during the year. Examples include energy saving appliances and lighting; high-efficiency heating, ventilating and air conditioning systems or control modification; efficient building design; advanced electric motors and drive systems; and heat recovery systems.

Demand-side Management (DSM) consists of electric utilities' planning, implementing, and monitoring of activities designed to encourage consumers to modify their levels and patterns of electricity consumption.

While valuable, these programs do not address the needs for increased transmission system reliability and load serving capability that the proposed project is designed to fulfill. Consequently, energy conservation and DSM were not considered viable alternatives to the proposed action.

Generation

PDMI has 60 MW of on-site generation at the Morenci Mine. This generation is maintained off line and is utilized to supplement purchased power during system outages and/or when AEPCO's transmission system is down due to maintenance or outages. MW&E's daily power requirements are fulfilled through purchased power contracts delivered over the existing AEPCO 230kV transmission system.

The current load at PDMI is 220 MW and is anticipated to increase to 350 MW by the end of 2000. The need to provide increased transmission system reliability and load serving capability could be

fulfilled by constructing additional generation units at PDMI. However, the installation of sufficient generation to backup the existing 230kV radial transmission line and provide the equivalent system reliability and load serving capability as the proposed 345kV transmission line would cost considerably more.

In 1995 a study was conducted to evaluate the load increase from 170 MW to 220 MW for 1996. The cost of the upgrade would have been \$85 million (1995\$). Looking ahead today, increasing the amount of on-site generation to reliably provide for a 350 MW load would cost more. The cost of adding sufficient on-site generation is far in excess of the cost to construct the proposed 345kV transmission line.

Consequently, upgrading the existing on-site generation was not considered a viable alternative to the proposed action.

Constructing a Second 230kV Transmission Line

Construction of the proposed transmission line at 230kV instead of 345kV would require installing 345/230kV transformers at the TEP Greenlee Substation, rather than at the Copper Verde Substation site as proposed. The TEP Greenlee site would require extensive site work due to the existing terrain and would result in substantially greater cost compared to the Copper Verde site. Also, there would be no transmission line cost savings if the line were constructed at 230kV instead of 345kV. The 230kV transmission line would require increased conductor size and heavier structures to obtain the same power transfer rating as a 345kV line. The heavier conductor and structure would add to the cost of the 230kV line negating any potential cost savings. Additionally, the environmental impacts from a 230kV line would be comparable to the 345kV line since the same access, structure type, and number of structures would be used.

Location of all MW&E 230kV and 345kV facilities in one location at the Copper Verde site in Morenci is more cost effective from an operations and maintenance perspective. The Copper Verde site is in close proximity to the MW&E operations center in Morenci compared to the TEP Greenlee site which is a 30 minute drive. The increased time needed to reach the TEP Greenlee site during outages and for maintenance would result in higher operating costs. In addition, locating the 345/230kV transformers at the Copper Verde site will allow MW&E to use the 25kV tertiary windings to serve distribution loads in Morenci and Clifton, eliminating the need to purchase and install yet another expensive 230/25kV transformer.

Because the construction of the line at 230kV would result in higher costs and be less desirable from an operations and maintenance perspective, this alternative was eliminated as a viable option to the proposed action.

Intertie at an Alternative 345kV Substation

Construction of a new transmission line to interconnect with the existing 345kV transmission grid at a location other than the TEP Greenlee Substation was considered. However, there are no other existing 345kV substation interconnection points closer to the load center than the TEP Greenlee Substation. Other potential transmission interconnection alternatives would require much longer transmission lines and facilities at greater cost than the proposed action. Interconnecting at an alternative 345kV substation site was not considered a viable alternative to the proposed action.

Undergrounding the 345kV Transmission Line

The use of underground construction was considered as an alternative to the proposed overhead 345kV transmission line. It was eliminated from further consideration because of the high cost and impacts associated with an underground transmission line. Underground 345kV transmission was not considered a viable alternative to the proposed action.

CHAPTER 3 - AFFECTED ENVIRONMENT

INTRODUCTION

The affected environment assessed for this EA includes a description of the natural, human, and cultural resources that would be potentially affected by the construction, operation, and maintenance of the proposed project. The boundary of the affected environment that was inventoried is referred to as the "study area" (shown on Figure 3). The following sections explain in detail the existing conditions found throughout the study area. Results are described for each key resource area and, where appropriate, specific locations identified by a link number or issue area are provided. Numbered links identify specific segments of the routes, as shown on Figure 3. Issue areas are addressed in the appropriate resource sections. Data were collected and analyzed in late 1998 and early 1999 through the review of existing documentation, consultation with various individuals and agencies, and field reconnaissance. Agencies consulted and references are listed in Chapter 5.

GENERAL PROJECT SETTING

The study area is located in Greenlee County in southeastern Arizona. The study area is characterized by plateaus, mesas, and surrounding domed mountains with elevations ranging from 3,500 to 4,000 feet. Past volcanic activity has generally shaped the landforms in the northern portion of the study area (the San Francisco fault line). The central and southern portions of the study area can be characterized as gently rolling desertscrub grassland hills with intermittent riparian stringers dissecting the landscape in a north and south direction. The San Francisco River is the principal watercourse in the study area. Additionally, PDMI's Morenci Mine dominates much of the northwest and western portions of the study area.

Two small mining towns, Clifton and Morenci, occur within the study area. The combined populations for these towns are about 4,600 residents, representing approximately 50 percent of Greenlee County's total 1998 population estimate of 9,304 residents (Arizona Department of Economic Security [DES] 1998). Additionally, two small unincorporated communities of Loma Linda and Verde Lee occur within portions of the study area. Three Way, a small retail outpost, also occurs on the southern edge of the study area.

LAND USE

The land use inventory identified jurisdiction, existing, planned, and officially designated land uses within the study area boundaries based on the review and interpretation of existing maps, documents, and field reconnaissance. Federal, state, county, and local agencies were contacted to obtain and/or confirm specific land use data. Designated BLM lands (Black Hills Back Country Byway and the Gila Box Riparian National Conservation Area [RNCA]) were inventoried in the study area. Typical

land uses within the study area include mining, residential, commercial and retail businesses, grazing and livestock facilities, utility corridors, transportation routes, and dispersed recreational areas.

Jurisdiction

The study area contains approximately 57 percent of lands administered by ASLD, 23 percent administered by the BLM, and 20 percent in a mixture of other jurisdictions or ownership including private ownership and county or municipal jurisdictions. Figure 6 illustrates jurisdiction and ownership.

Existing and Future Land Uses

The following sections describe existing and future land uses identified within the study area (Figure 7).

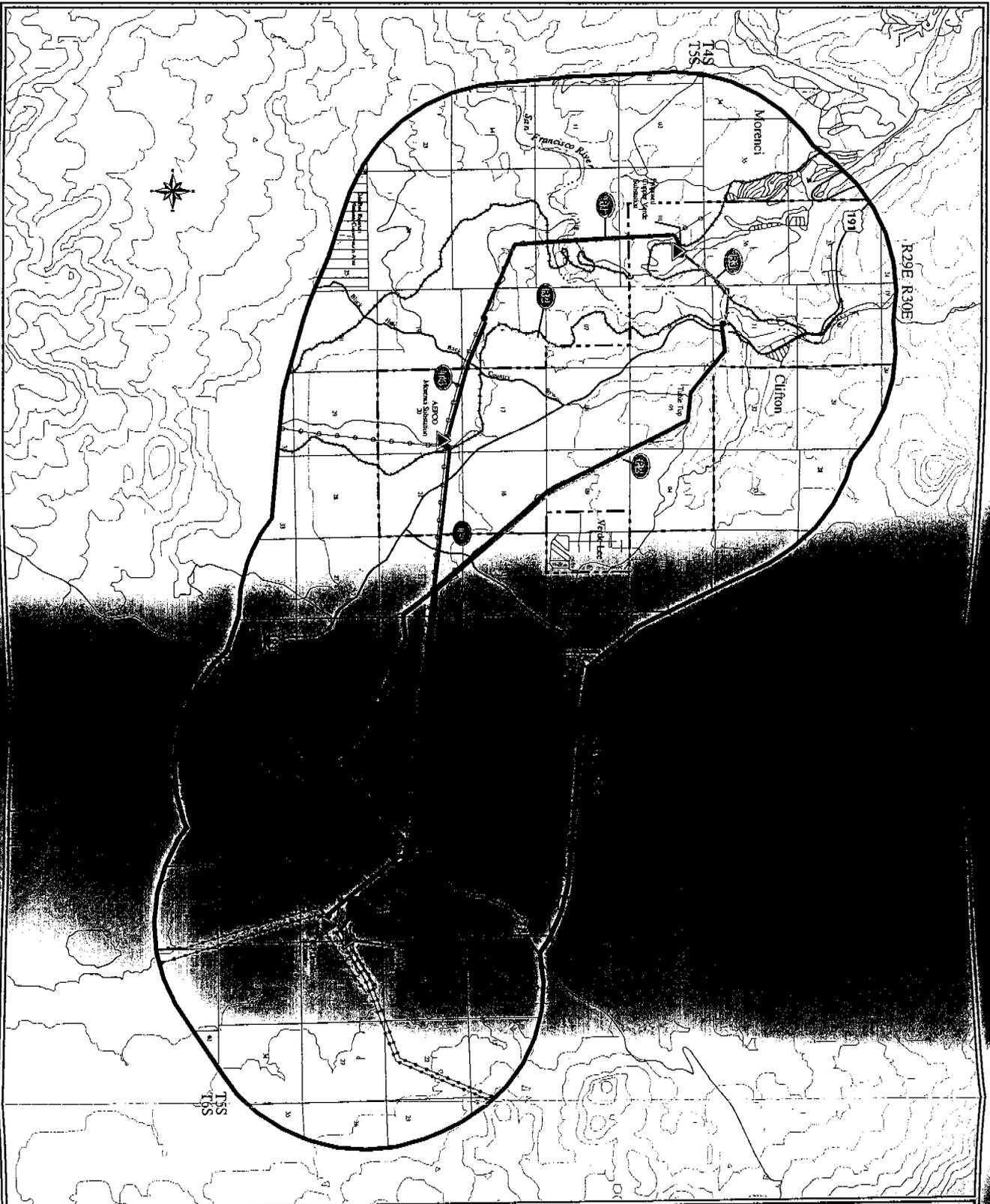
Residential

This category includes low, medium, and high density residential development as well as dispersed rural residences (i.e., Loma Linda and Verde Lee). Primarily the northwestern portions of the study area consist of low to medium density residential subdivisions, including manufactured and mobile housing units and dispersed rural residences that are generally located near the communities of Clifton, Verde Lee, and Loma Linda. High density residential development occurs within Morenci. No agricultural land uses were identified within the study area. Public and quasi-public land uses that were inventoried within the study area include churches, schools, cemeteries, and law enforcement facilities.

Additionally, as a result of the flood of 1983, the town of Clifton acquired 120 acres from the BLM on Table Top (T5S, R30E, Section 5). This area is outside of the San Francisco floodplain and is conceptually planned for future mixed use development (high to medium density housing, parks, and public-quasi public facilities).

Commercial and Industrial

Commercial uses in the study area generally include commercial and retail establishments. Most commercial and retail land uses are located in Morenci and Clifton, although there is mixed



Proposed and Alternative Routes
 Morenci Water & Light
 345kV Intentional Project

Legend

- Substation Alternatives**
- Proposed Route (R1) (R1)
 - Link S1
 - Alternative Route (R2) (R2)
 - Links S1, S2

- Cross-County Alternatives**
- Proposed Route (A1)
 - Links T1, T2, T3, T4
 - Alternative Route (A2)
 - Links T1, T2, T3
 - Alternative Route (A3)
 - Links T1, T2, T3

- San Francisco River Alternatives**
- Proposed Route (R1) (R1)
 - Link R1
 - Alternative Route (R2) (R2)
 - Link R3
 - Alternative Route (R3) (R3)
 - Link R2

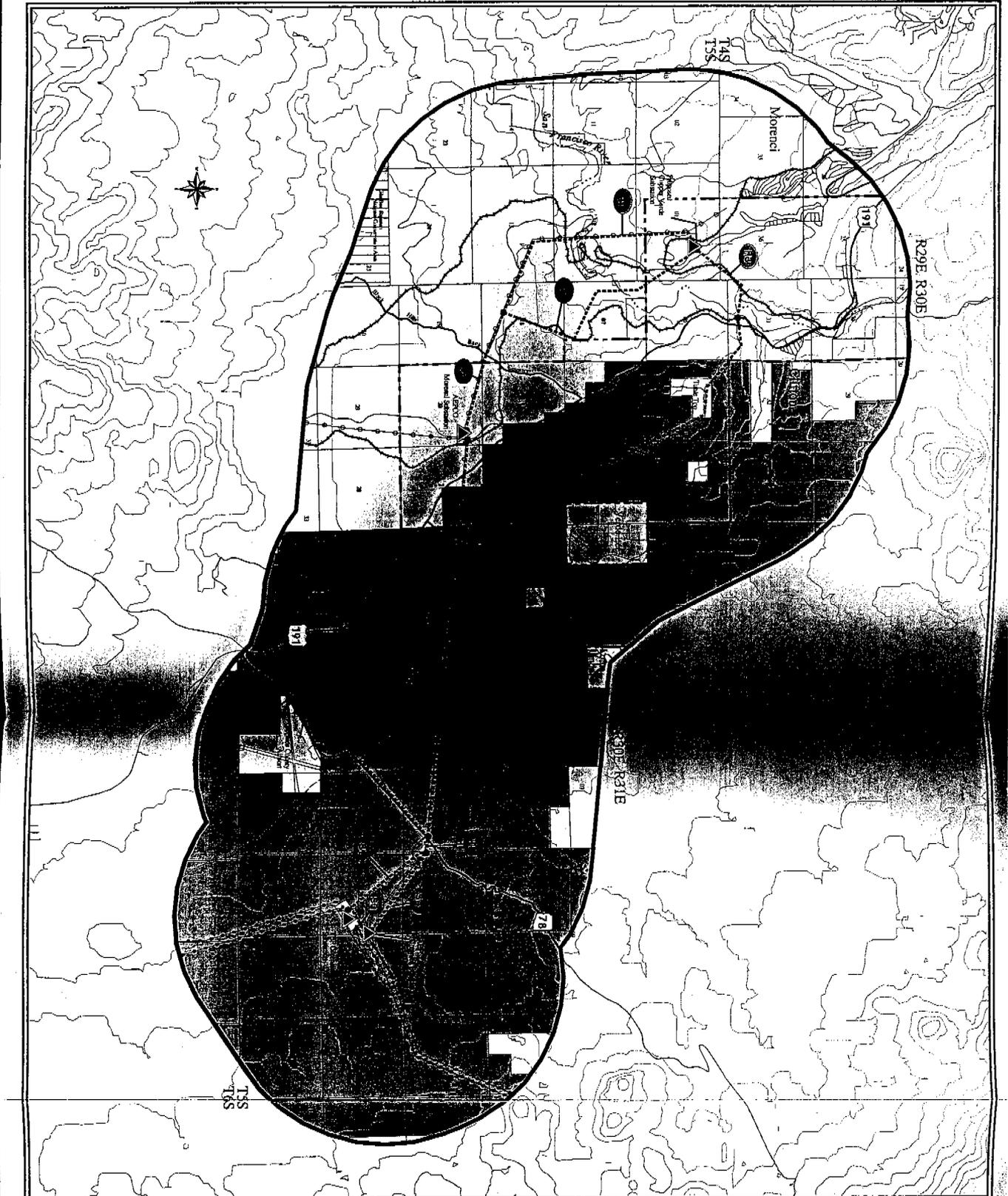
Figure 3

General Reference Features

- Power Substation
- Proposed Substation - Final Approval
- Gila Box Riparian National Conservation Area
- 345kV Transmission Line
- 230kV Transmission Line
- Pipeline
- Community Boundaries
- Primary Transportation Routes
- Secondary Transportation Routes
- Railroads
- Study Area Boundary

Scale in Miles





Jurisdiction and Ownership

Morenci Water & Power
345kV Inter tie Project

- Other
- State Land
- Bureau of Land Management
- Alternative Routes
- Link Identifier for Routes
- Link Node

Figure 6

General Reference Features

- ▲ Power Substation
- ▲ Proposed Substation - Final Approval
- Gila Box Riparian National Conservation Area
- 345kV Transmission Line
- 230kV Transmission Line
- Pipeline
- Community Boundaries
- Primary Transportation Routes
- Secondary Transportation Routes
- Railroads
- Study Area Boundary

Scale in Miles



Existing and Future
Land Use

Morenci Water & Electric
345kV Intertie Project

Resource Inventory

- Residential Low Density
- Residential Medium Density
- Residential High Density
- Commercial
- Mixed Use
- Industrial
- Corridor
- Airport
- Airport Influence Area
- Public/Quasi-Public Facilities
- Schools
- Vacant/Underdeveloped
- Parks
- Recreation
- BLM Sensitive/Recreation Study Area
- Proposed Development - Concept Stage
- Church
- Abandoned Church
- Water Tower/Tank
- Alternative Routes
- Link Identifier for Routes
- Link Node

Figure 7

General Reference Features

- Power Substation
- Proposed Substation - Final Approval
- Gila Box Riparian National Conservation Area
- 345kV Transmission Line
- 230kV Transmission Line
- Pipeline
- Community Boundaries
- Primary Transportation Routes
- Secondary Transportation Routes
- Railroads
- Study Area Boundary

Scale in Miles



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use development in the vicinity of Three Way. Industrial uses within the study area include the Morenci Mine located in the northwestern and western portions of the study area. Active and inactive railroads traverse the western portion of the study area. Other industrial uses within the study area include city and county maintenance yards and a county operated landfill south of Verde Lee and Loma Linda along Skyline Drive Road.

The Greenlee County Airport (approximately 7 miles southeast of Clifton) occurs in the study area and utilizes one 4,995-foot paved runway. In 1993, Greenlee County retained a third-party consultant to develop a Comprehensive Master Plan for the airport. The document outlines plans to expand or reconfigure the existing runway to allow for larger aircraft to utilize the facility.

Utilities

The existing AEPCO 230kV transmission line generally traverses the study area from the east to northwest, from the AEPCO Greenlee Substation (T5S, R31E, Section 29) to Morenci, Arizona. Additionally, AEPCO maintains a second 230kV transmission line from the AEPCO Morenci Substation (T5S, R30E, Section 20) to Safford, Arizona. AEPCO, TEP, Public Service Company of New Mexico, El Paso Electric, and the Texas/New Mexico Power Cooperative also share ownership of transmission lines into and out of the TEP Greenlee Substation. Two El Paso Natural Gas Company high-pressured natural gas pipelines were identified within the study area. Additionally, Duncan Valley Electric Cooperative maintains electric distribution lines within the study area.

Transportation

The study area encompasses a mix of federal, state, county, and secondary roadways. Primary highways identified in the study area include US 191, State Route (SR) 75, and SR 78. Numerous paved and unpaved roads provide access to residences. Non-maintained BLM roads (Recreation Drive Road and Black Hills Back Country Byway) were identified in the study area that provide access to BLM lands.

Recreation

Recreation uses within the study area include parks and designated BLM lands as well as dispersed recreation activities. Several municipal parks and recreation areas were identified within the towns of Morenci and Clifton. The Town of Clifton's Comprehensive Plan (1986) designates a small amount of planned recreational vehicle use within the floodplain of the San Francisco River north of town.

Recreation use on BLM lands within the study area is primarily of a dispersed nature, including off-highway vehicle use, hiking, wildlife viewing and photography, hunting, mountain biking, rafting, picnicking, camping, horseback riding, etc.

Additionally, the Arizona Desert Wilderness Act of 1990 (Public Law 101-628) designated the Gila Box RNCA. The Gila Box RNCA encompasses approximately 21,767 acres of BLM land and 1,720 acres of private land. Portions of the Gila Box RNCA that occur in the study area are within T5S, R29E, Sections 25 and 26.

The Safford District Resource Management Plan, as amended (October 1994) has designated portions of the San Francisco River (T5S, R29E, Section 12; west of the existing AEPSCO 230kV right-of-way to the boundary of the Gila Box RNCA) to be further evaluated for "recreational" qualities (Federal Register; 47 FR 39457-9). The Arizona's River Coalition has proposed portions of the San Francisco River, within the study area, for inclusion into the National Wild and Scenic Rivers system (Arizona Rivers: Lifeblood of the Desert, a Citizen's Proposal for the Protection of Rivers in Arizona, 1991). At this time, Congress has not authorized Wild & Scenic River status for any of the segments proposed in the Safford District Resource Management Plan.

A portion of the old Clifton to Safford Road was designated by the BLM as the Black Hills Back Country Byway. Portions of the byway that traverse the study area begin in T5S, R30E Section 8 (at US 191) to T5S, R29E, Section 25. Along this portion of the byway an entrance kiosk and parking pull-out are located in Section 17. As part of this designation, the BLM has provided interpretive information along the byway which includes a description of the public lands' multiple use mandate as it relates to recreation areas, cultural sites, wildlife and biology, and utilities.

Recreation Opportunity Spectrum

The Recreation Opportunity Spectrum (ROS) is a land classification system used to categorize BLM land into six classes. Each ROS classification is defined by its setting, natural or developed, and by the probable recreational experiences and activities that it affords. In the BLM planning process, ROS classifications are used to help set recreation themes within each of the BLM's management areas. All routes that cross BLM land occur within the Roaded Natural category.

VISUAL RESOURCES

The visual resource study addressed the inherent aesthetics of the landscape, public value of viewing the landscape, and sensitivity to visual effects from the proposed action. The visual study analysis was conducted in compliance with the BLM Visual Resource Inventory (BLM Manual 8410-1, January 1986). The visual inventory included an evaluation of the existing visual conditions, scenic quality, visual sensitivity, and agency visual management objectives. A 4-mile-wide corridor

(2 miles on either side of the assumed centerline) was inventoried. Appendix C contains supplemental visual resource data.

Existing Visual Conditions

The study area is located within the Datil physiographic province in southeastern Arizona (Landscape Character Types of the National Forests In Arizona and New Mexico, 1989). The topographic character within the central and southern portions of the study area can be described as flat to gently sloping hills dissected by riparian tributaries. Along the San Francisco River and within the Gila Box RNCA, the topographic character is distinctively varied with 100-foot sheer cliffs and riparian canyons. The northwestern portion of the study area around the Morenci Mine shows evidence of high topographic modifications as a result of more than a century of mining activity. The topographic character around the town of Clifton is visually interesting with auburn cliffs resulting from the presence of the San Francisco fault line.

The vegetation character of the study area includes desertscrub grasslands (scrub mesquite, creosote bush, yucca, ocotillo, and grass and cacti species) with some riparian areas (willows, cottonwoods, and tamarisk), meandering north/northeast to southwest along the San Francisco River and other riparian areas.

Cultural modifications in the study area include the communities of Morenci, Clifton, Loma Linda, Verde Lee, and Three Way. Other modifications include major travel routes such as US 191, SR 75 and SR 78. The Morenci Mine footprint occupies the majority of the northwestern and western portions of the study area. Substations that occur in the study area include TEP Greenlee, AEPCO Greenlee, and AEPCO Morenci. Numerous telephone and 12kV distribution lines, 230kV and 345kV transmissions lines, and natural gas pipelines occur within the study area.

Scenic Quality

Scenic Quality Rating Units (SQRUs) are used by the BLM to describe specific natural landscape types found within the larger landscape ecotype. The designations are categorized into three levels—A, B, and C. See Appendix C for scenic quality inventory data.

Class A landscapes within the study area are primarily associated with riparian areas along the San Francisco River. Class B landscapes are primarily associated with rolling hills of desertscrub grasslands, and riparian stringers. Class C landscapes primarily are associated with flat to gently sloping desertscrub grasslands, which includes the majority of lands inventoried in the study area.

Visual Sensitivity

Key Observation Points (KOPs) were identified through contacts with BLM personnel, data gathered during field inventories, and aerial photograph interpretation. KOPs were assigned a visual sensitivity level of high or moderate. Levels of sensitivity were determined through the evaluation of the sensitivity of the viewpoint with regards to viewer concern for change, volume of use, public and agency concerns, public expectations, influence of adjacent land uses, and viewing duration. High levels of visual sensitivity were assigned to residences, recreation areas, and cultural sites listed on the National Register.

Moderate levels of sensitivity were assigned to major travel routes and planned residential and recreation areas.

Agency Visual Management Objectives

Within the study area, VRM Class II landscapes were inventoried along the San Francisco River. The remaining portions of BLM lands were inventoried as VRM Class III. See Appendix C for VRM definitions.

CULTURAL RESOURCES AND NATIVE AMERICAN VALUES

Cultural resources typically are defined to include archaeological sites, buildings, structures, districts, and objects as those property types have been defined in the National Historic Preservation Act (NHPA), as amended. Traditional cultural properties (or places) and sacred sites valued by traditional communities (often but not necessarily Native American groups) also are included among cultural resources. The NHPA and its implementing regulations provide guidance for determining whether cultural resources are of sufficient importance to be determined eligible for listing on the National Register of Historic Places (National Register). Cultural resources can be either prehistoric or historic in age; "historic" is used here to describe an age range rather than to denote past importance. In the Southwest, the break between prehistory and history is understood to have occurred in the sixteenth century when written records were produced by Spanish explorers; however, it is recognized that Native American oral traditions also may provide accounts of earlier time periods. To be regarded as historic in age, properties ordinarily must be at least 50 years old, but younger properties of exceptional importance also are included among cultural resources deemed worthy of consideration under the NHPA.

The cultural resources inventory was accomplished by compiling existing data for the study area, which encompasses all of the routes considered. Pertinent literature was examined, and records were reviewed at the State Historic Preservation Office (SHPO), BLM Safford Field Office, Arizona State University Department of Anthropology, and Arizona State Museum. United States Geological

Survey quadrangles and General Land Office plats (on file at the BLM State Office) also were examined for possible historic locales. BLM and ASLD cultural resource managers also were queried regarding important cultural resources. Potential Native American cultural resource issues and concerns were elicited by mailing a fact sheet to tribal leaders and cultural preservation specialists, with follow up telephone inquiries.

There are records of 31 cultural resource inventories within the study area; 18 of these were conducted between 1976 and 1997 and cover portions of the routes under consideration. Just a fraction of the broader study area has been surveyed. The AEPCO transmission system, which parallels Links S4 (eliminated link), T(1-4), and R1, was inventoried in the mid 1970s and resurveyed this past year to provide recommendations for managing archaeological sites and avoiding future impacts (Kayser 1999).

Of the recorded cultural resources within the larger study area, 36 are situated within one-quarter-mile of the centerline of the proposed and alternative transmission line routes (Table D-1 located in Appendix D). These cultural resources include the following:

- 22 lithic scatters of undetermined age and cultural affiliation (some with associated rock features and two with associated historic trash)
- two historic roads
- two historic railroads
- three accumulations of Civilian Conservation Corps water and soil conservation features
- an undated rock pile
- an agricultural field area
- a prehistoric artifact scatter
- a lithic scatter with rock piles attributed to the Formative Mogollon cultural tradition
- a Euroamerican trash scatter
- a historic mine
- a historic bridge

Determinations of eligibility for listing on the National Register of Historic Places have not been made for these cultural resources. It is likely many of the archaeological sites would be regarded as eligible for National Register listing under Criterion D, for their information potential if they retain sufficient integrity (that is, if they have not been badly disturbed). The historic bridge (ADOT Bridge #8150) is listed on the National Register under Criterion C for its engineering importance. The Civilian Conservation Corps water and soil conservation features likely would be determined eligible for listing under Criteria D as well as A for their association with an important event in American history. The eligibility for National Register listing of the historic roads and railroads will depend on their historic associations as well as integrity.

Tribal governing officials and cultural preservation specialists from the following eight Native American communities were sent a fact sheet describing the proposed transmission line project:

- Ak-Chin Indian Community
- Gila River Indian Community
- Hopi Tribe
- Salt River Pima-Maricopa Indian Community
- San Carlos Apache Tribe
- Tohono O'odham Nation
- White Mountain Apache Tribe
- Zuni Tribe

Dames & Moore cultural anthropologist Dr. Shelby Tisdale made follow up telephone calls (and sent replacement copies of the fact sheet when requested) to (1) confirm receipt of the fact sheet, (2) ask whether the tribe had an interest in the study area or concerns about the project and (3) determine whether the tribe wished to receive additional information about the project as it became available.

The results of these contacts (which number over 100 including telephone calls and communications via facsimile) are summarized here. All eight contacted tribes are interested in continuing to receive information about the project; thus, consultation is ongoing among the tribes and BLM. The Four Southern Tribes (Ak-Chin, Gila River, Salt River, and the Tohono O'odham Nation) decided Gila River would take the lead; they indicated a written response would be sent to the BLM Safford Field Office. San Carlos indicated they likely would work with the White Mountain Apache concerning this project and that a written response would be sent to the BLM. Written comments were provided by White Mountain Apache, Zuni, and Hopi tribes.

The White Mountain Apache Tribe expressed opposition to the project through Apache ancestral lands but did not identify specific cultural resource locations of concern. The Zuni Tribe indicated that ancestral Zunis had migrated into the study area although specific locations are not known; they requested further consultation and indicated that their principal concern relates to protection of prehistoric properties. The Hopi Tribe indicated that the study area is of traditional cultural concern to a number of their clans, and therefore requested full participation in the NEPA process including identification and assessment of specific resources that might be subject to effect.

BIOLOGICAL RESOURCES

This section characterizes the biological resources that are present in the study area and identifies areas and species of concern. The inventory includes the vegetation types, wildlife, and known and potential habitat for special status species. Special status species are those species listed by the federal government as threatened or endangered or candidate species for such listing, in addition to species of concern to the BLM and the state of Arizona.

Actions potentially affecting biological resources are regulated by several federal legislative acts. The Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) as amended, provides the FWS the

authority to protect wildlife and plant species designated as threatened or endangered. All wild birds except starlings and house sparrows are protected by the Migratory Bird Treaty Act of 1986. Additional legislation affording protection to wildlife species and their respective habitat on public land includes the Sikes Act, Title II (16 U.S.C. 670 et seq.) as amended; FLPMA (43 U.S.C. 1701); and NEPA. Additionally, BLM has policies that guide land management activities.

Biological data were obtained primarily from agency contacts and existing literature. Field visits were conducted on January 30 and April 23, 1999. Special status species information was gathered from existing sources including the FWS Field Office in Phoenix, AGFD, and BLM.

Vegetation Types and Associated Wildlife

Semi-Desert Grasslands Biome

The semi-desert grassland biome is associated with the desert-grassland transition zone and is known by other names such as mesquite grassland, desert savanna, or grassland transition (Brown 1994). This community is often dominated by perennial grass scrub and occurs between desertscrub and evergreen woodland or plains grassland. This biome is found in Mexico, Trans-Pecos Texas, southern New Mexico, and southeastern Arizona.

The majority of the study area is characterized by the semi-desert grasslands community (Brown 1982). A narrow band of semi-desertscrub extends northwest to the southeast through Clifton and Morenci. Plant species associated with Chihuahuan desertscrub are present at the lower elevational limits on the boundary of the study area. North of the study area, as elevations increase, species of the Madrean woodland occur. Perennial grasses and scrubby species generally characterize the landscape within semi-desert grasslands. The study area does not support a high diversity of native grasses due to grazing and other land use practices. Vegetation is relatively homogeneous, characterized primarily by tobosa grass, red brome, and snakeweed. Mesquite, ocotillo, creosote bush, and yucca are locally common. Cacti are sparse throughout the study area, and include barrel cacti, chollas, prickly pear, and hedgehogs.

Semi-desert grassland communities support a wide variety of wildlife species. Large mammals include coyote, bobcat, javelina, and mule deer. Smaller mammals in the area include pocket mice, rabbits, kangaroo rats, and ground squirrels. Typical bird species include Swainson's hawk, prairie falcon, kestrel, Gambel's quail, mourning dove, horned lark, Say's phoebe, Chihuahuan raven, loggerhead shrike, and lark sparrow. Amphibian and reptile species include the western green toad and southwestern earless lizard (Brown 1994).

Xeriparian Habitat

The numerous dry washes that drain the study area are generally wide and braided and several are within deeper, rocky canyons. Xeriparian habitats, which occur along these larger intermittent washes, are characterized by more diverse, multi-leveled vegetation communities. Vegetation within and along these drainages is denser and includes paloverde, desert broom, catclaw, mesquite, burrobush, and rabbitbrush. Cold Creek, Buzzard Roost, and Rattlesnake Canyon are crossed by Links P1 and T2. Owl Canyon is crossed by Links P2 and T4. Stock Pen and Negro canyons are crossed by Link T4.

Wildlife, particularly birds, is more common along these drainages which provide greater opportunities for nesting and feeding. Larger wildlife, including mule deer, coyote, javelina, and bobcat, utilize these washes as travel corridors.

Riparian Habitat

Riparian habitats are associated with perennial streams. The San Francisco River is a perennial waterway located in the western portion of the study area. It supports a moderately well-developed riparian habitat including tamarisk, cottonwood, and willow. Riparian habitat is well-recognized for its inherent high productivity and value to wildlife. Links R1, R2, and R3 cross the San Francisco River.

Aquatic Habitat

The San Francisco River is a perennial stream, which provides habitat for numerous fish species. Amphibians are likely to be found along the edges of the water where the water flow is slower. Other wildlife species that utilize this important source of water include deer, rabbits, coyotes, ground squirrels, quail, doves, black-tailed gnatcatcher, Say's phoebe, and mourning dove.

Special Status Species

Special status species are those species which are listed by the federal government as threatened, endangered, or which are candidates for such listing; by the AGFD as Wildlife of Special Concern in Arizona; or listed as sensitive by the BLM. Special status species that occur or potentially could occur in the study area were identified by the FWS, AGFD, and BLM.

No known occurrences of special status species have been documented within the study area. Several of the special status species listed as potentially occurring would be restricted to the riparian/aquatic habitat of the San Francisco River. Two plant species associated with the grassland habitat are the

endangered Arizona hedgehog cactus and the San Carlos buckwheat, a state-protected plant. The Arizona hedgehog cactus, potentially located in the study area, is undergoing taxonomic review and is currently being considered the same variety as the one listed as endangered. No individual cactus was found during a field survey for the Arizona hedgehog cactus April 23, 1999. A Biological Evaluation was completed for this project and is located in Appendix E. Table E-1 presents the special status species identified within Greenlee County and the study area, including the scientific name, habitat association, status, and potential for occurrence in the study area.

SOCIOECONOMICS

Unless otherwise cited, information in this section was obtained from the DES and U.S. Census Bureau 1999. The demographic, economic, and fiscal attributes of the study area were inventoried to generally characterize the socioeconomic conditions that may be affected as a result of the proposed action.

Demographics

Greenlee County has populated areas concentrated in Morenci, Clifton, Duncan, and scattered rural residences along the Gila River and unincorporated lands such as Verde Lee and Loma Linda. Population data from the U.S. Census Bureau between 1990 and 1999 show a population increase in Clifton by 6.5 percent (2,840 to 3,025 residents). Currently, Morenci has a population of approximately 1,575 residents. The combined populations of both towns make up approximately one-half of Greenlee County's population of 9,396. Ethnicity distribution in the county is 49 percent white, 48 percent Hispanic, 2.6 percent American Indian, and 0.4 percent black.

Principal Economic Activities

The principal economic activities in the study area are copper mining, tourism, and retail services. Clifton is heavily dependent on mining, traveling tourists, and retail services (e.g., food, eating and drinking establishments, and service stations). Morenci and Clifton provide public schools, medical facilities, and recreation opportunities. Primary attractions in the study area include the Gila Box RNCA, San Francisco River, Black Hills Back Country Byway, Coronado Scenic Byway (north of the study area), Morenci Mine, and Historic District of old town Clifton.

Employment and Income

The county civilian labor force was 4,325 (mining), 2,600 (construction), and 700 (manufacturing) with an unemployment rate of 7.3 percent. Average per capita income in Greenlee County in the 1995 census was \$17,469 (DES 1999). The principal employer in the study area is PDMI.

EARTH AND WATER RESOURCES

Physiography

The study area is located in the Transition Zone between the Colorado Plateau and the Basin and Range physiographic provinces. The Transition Zone is a 50- to 150-mile-wide northwest to southeast trending band across Arizona that separates the Colorado Plateau from the Basin and Range. The Transition Zone is characterized by rugged topography. It includes northwest-southeast trending, subparallel, fault-bordered mountains separated by alluvial-filled valleys, as well as exposed flat lying sedimentary rocks with characteristics similar to the Colorado Plateau. The Transition Zone is bounded by the Safford Valley to the south and the Mogollon Rim to the north.

General Geology

The study area includes primarily Quaternary-Tertiary alluvial deposits and sedimentary rocks in the valley and Gila River floodplain surrounded by mountains consisting of Tertiary volcanic rocks, Paleozoic sedimentary rocks, and Precambrian igneous rocks (Arizona Geological Survey 1988). The alluvial deposits include unconsolidated to moderately consolidated silts, sands, clays, gravels, and cobbles.

The Morenci-Clifton area is part of the Copper Mountain Mineral District. Mining of copper, lead, zinc, molybdenum, gold, silver, manganese, and other base or precious metals began in the 1870s (Arizona Bureau of Geology and Mineral Technology 1983). Mining operations in the study area are currently active.

Soils

The soils in the area have been mapped by the Natural Resources Conservation Service (formerly Soil Conservation Service [1981]). The Tres Hermanos-Continental-Nickel complex occurs throughout most of the study area on fan terraces and hillslopes. These deep, well-drained soils have a moderate water erosion hazard potential. This unit includes very gravelly sandy clay loams, gravelly sandy clay loams, and extremely cobbly sandy loams. To the west of SR 78 (Link T2) and extending eastward to the TEP Greenlee Substation, the predominant soils also include the

Continental gravelly clay loam. This soil has a slight water erosion hazard. Soils of the Torrifluents-Riverwash complex occur in the major drainages of the area. These are deep, well-drained soils. Torrifluents consist of highly variable soils that are moderately coarse to coarse textured, stratified with finer-textured material. The hazard of water erosion is slight to high. Riverwash consists of stratified layers of sand, cobbles, and gravel. The Torrifluents-Riverwash complex is subject to flooding. Cutbanks are often not stable so slumping may occur.

Links R1, R2, R3, P2, P1, T3, and T4 cross soils of the Tres Hermanos-Continental-Nickel complex and the Torrifluents-Riverwash complex. Links T1, T2, S1, S3, and S4 cross those soil types, as well as the Continental gravelly clay loam.

Water Resources

The study area is in a portion of the Upper Gila watershed. Surface water drainage of the study area is to the south and southwest by numerous washes that typically flow in response to rainfall and snowmelt. Drainage is to the San Francisco River and Gila River. Portions of the San Francisco River, Cold Creek, and the Gila River have perennial flow. The San Francisco River is the largest tributary to the Gila River in the Upper Gila watershed. Agriculture is the major use of surface water in the watershed. Irrigation water is obtained from the Gila River from wells pumping groundwater at several diversion points along the river. The public water supply of Clifton is obtained from the San Francisco River (Arizona Department of Water Resources [ADWR] 1999).

Surface water quality within the watershed is affected by agricultural irrigation, rangeland management practices, and mining activities. The San Francisco River tends to be high in sodium and chloride; high levels of total dissolved solids are the result of flows from fault-generated springs and seeps that originate in underlying evaporite beds (ADWR 1999). The Federal Emergency Management Agency (FEMA) has delineated 100-year floodplain and other areas that are subject to flooding. The drainages and rivers within 100-year floodplains (Zone A) include San Francisco River, Rattlesnake Canyon Creek, Buzzard Roost Canyon Creek, Cold Creek, Willow Creek, and Lop Ear Creek.

The remaining portions of the study area are designated as subject to minimal flooding (Zone C) by FEMA.

Links R1, R2, and R3 cross the San Francisco River, which has perennial flow. Links P1 and T1 cross Cold Creek, portions of which have perennial flow. The proposed and alternative routes cross washes with intermittent flow that drain to the Gila River.

AIR QUALITY AND NOISE

The proposed action does not fall within any nonattainment area, as designated by the Environmental Protection Agency (EPA) pursuant to Section 107 of the Clean Air Act. Consequently, there is neither a State Implementation Plan nor a Federal Implementation Plan requiring specific measures with respect to the ambient air quality within the study area.

Ambient noise within the southern and eastern portions of the study area is minimal, with intermittent noises from passing vehicles on US 191, SR 78, and SR 75. Conversely, ambient noise within the western and northwestern portions of the study area is present with the nearly continuous sounds associated with mining operations and the ingress and egress of trains to support these operations.

CHAPTER 4 -ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

The purpose of this section is to describe potential effects to the environment that could result from construction, operation, presence, and maintenance of the proposed action. Impacts that may result were determined by comparing the proposed and alternative routes to the existing environment (Chapter 3). The potential impacts are described as either low, moderate, or high; indirect, direct, or cumulative. The indirect and direct impacts are discussed in the individual resource section. Cumulative impacts are discussed at the end of this chapter. The impact analysis is based on the inventory results and standard practices combined with professional judgment of the principal investigator for each of the environmental resources. Anticipated environmental consequences are described for the no-action alternative and the proposed and alternative routes. Link segments and alternatives described for the proposed and alternative routes are identified on Figure 3, located in Chapter 2.

Impact types were described as high, moderate, or low and are described below.

- High Impact—A high level of impact would result if the construction, operation, maintenance, presence, or abandonment of the proposed action would potentially cause a significant or substantial adverse change or stress to an environmental resource(s).
- Moderate Impact—A moderate impact would result if the construction, operation, maintenance, presence, or abandonment of the proposed action would potentially cause some adverse change or stress (ranging between significant and insignificant) to an environmental resource(s).
- Low Impact—A low impact would result if the construction, operation, maintenance, presence, or abandonment of the proposed action would potentially cause an insignificant or small adverse change or stress to an environmental resource(s).

Mitigation measures to reduce potentially higher initial impacts were applied to the resource affected. The resulting residual impacts are described under the following respective resources. Mitigation measures are briefly discussed within each resource section (if applicable) and are described in detail in Appendix B.

LAND USE

Land use impacts are typically physical restrictions and operational effects of the proposed action to existing and planned land uses. Impacts were identified along the proposed and alternative routes

and described by issue area or link. All routes avoid significant direct physical conflicts with existing residences, commercial and industrial areas, mining, and grazing activities.

Right-of-way permits that would be required include a right-of-way permit application for the BLM, a right-of-way easement for Arizona State lands, and landowner negotiations for private property (if applicable). Private landowner negotiations are a matter of technical coordination and a realty agreement between the concerned parties, so they are not addressed in the study.

No-action Alternative

No impacts on existing or future land uses would occur as a result of this alternative.

Proposed Route – TEP1 (Link S1), A1 (Links T1, T2, T3, and T4), River 1 (Link R1)

Existing and Future Land Use

No moderate or high impacts to land uses are anticipated from physically displacing, altering, or affecting any established existing or future land uses. The total amount of existing access available along this route is approximately 90 percent. The total amount of grazing land disturbed would be minimal and negligible in the long term.

Recreation

No moderate or high impacts to land uses are anticipated from physically displacing, altering, or affecting any established existing or future recreation areas. Low impacts to BLM and other lands within and adjacent to the study area may occur from increased dispersed recreational use due to the influx of construction workers. Portions of Links T3, T4, and R1 cross Roaded Natural ROS settings. No moderate or high impacts are expected to occur to the BLM designated Black Hills Back Country Byway (Link T4) or within the San Francisco River corridor (Link R1).

Alternative Routes - TEP3 (Links S3 and S4), A3 (Links T1, T2, P2), A4 (Links T1, P1, and P2), River 3 (Link R3), and River 2 (Link R2)

Existing and Future Land Use

Moderate impacts to airport zones of influence may occur along Link P1 for an undetermined length at the Greenlee County Airport with any future runway realignment plans. Low impacts to future land uses may also occur along Link P2 for approximately 0.47 mile (Table Top). The town of

Clifton Comprehensive Plan, conceptual in nature, includes mixed use, residential, and recreational development within this 120-acre parcel. Discussions with the town manager of Clifton indicate it is unlikely that funding will be made available in the foreseeable future to develop Table Top. The total amount of existing access along Links S3, S4, T1, T2, P1, P2, and R3 is approximately 100 percent.

Recreation

No high or moderate impacts would occur along Link R2 to recreational areas within the San Francisco River corridor. Portions of Link R2 cross a Roaded Natural ROS setting.

VISUAL RESOURCES

The potential impacts of the proposed action on visual resources within the study area would result from project activities occurring during construction and the long-term presence of the proposed action.

Potential visual impacts resulting from the proposed action range from high to low. Impact types expected to occur from the construction and the long-term presence of the proposed project include effects on residential views, recreation area views, travel route views, and scenic quality (a description of the visual resources impact assessment methods, types, and levels is presented in Appendix C).

Landform and vegetation disturbance will be held to a minimum due to use of existing access roads where practical and the spanning of riparian areas. Initial impacts were reduced as a result of the use of generic and specific mitigation measures incorporated in the project description (i.e., spanning of riparian areas, use of self-weathering steel H-frame structures, and use of non-specular conductors).

No-action Alternative

No impacts on visual resources would occur as a result of this alternative.

Agency Management Objectives

No BLM lands occur along Links S3, S4, T1, T2, P1, P2, or R3. Portions of Link R2 that cross BLM land are not in compliance with VRM Class II.

CULTURAL RESOURCES AND NATIVE AMERICAN VALUES

Impacts to cultural resources from overhead electrical utilities can result from ground disturbance or other physical alterations associated with the installation of power poles and stringing of conductors as well as the construction, use, and upgrading of access roads during construction and subsequent maintenance activities. More rarely, cultural properties can be affected by visual intrusions. Such intrusions ordinarily pertain only to cultural resources valued for characteristics other than their information content and for which there is public sentiment for in-place preservation in an unaltered setting. Standing historic buildings and structures and traditional cultural places are among property types potentially subject to visual intrusions.

As described in Chapter 3, 36 cultural properties have been recorded within one-quarter mile of the routes under consideration, but much of the acreage being considered has not been intensively inspected (that is, subjected to pedestrian archaeological survey), nor has consultation regarding the eligibility for listing on the National Register of the known historic roads and railroads been conducted. Potential initial impacts and additional inventory requirements are summarized in Table 3.

Route	Link(s)	Known Cultural Resources	Near Major Water Course	Unsurveyed	Initial Impact
Proposed Route	S1	2	no	95%	moderate
	T1, T2, T3, T4	23	no	98%	moderate
	R1	7	yes	84%	moderate
Alternative Routes	S3, S4, T3	3	no	92%	moderate
	T1, P1,	7	no	84%	moderate
	R3	0	yes	100%	moderate
	R2	2	yes	100%	moderate

If a decision is made to go forward with the proposed action, the undertaking will be conducted in accordance with Section 106 of the NHPA and similar state statutes. The selected route will be intensively surveyed and nearby properties that could be subject to visual intrusions will be assessed. Thereafter, the BLM and ASLD will consult, if necessary and as appropriate, with the SHPO and Advisory Council on Historic Preservation to determine the level of effect likely to result from the

proposed action. As an aspect of that consultation, requisite mitigation measures will be agreed upon to lessen any anticipated adverse effects. Because the inventory is incomplete and compliance with Section 106 and state statutes is pending, the impact assessment reported here is based on a consideration of known and projected data.

High initial impacts would be anticipated only where a route might affect a highly sensitive cultural resource. These are defined to include National Landmarks and Monuments (none occur within the study area), places identified as traditional cultural properties or sacred sites (to date, none have been specifically identified within the study area), and properties listed on or determined eligible for listing the National Register under criteria other than D. A single such property has been identified, ADOT Bridge #8150. This bridge will not be physically affected and its setting is already compromised; therefore, visual impacts are not expected to be high. Moderate initial impacts are projected for links that cross the San Francisco River where unrecorded major archaeological sites and historic mining facilities may be present. Low projected initial impacts were identified for links that had actually been surveyed and where insubstantial or small archaeological sites had been recorded, or where there was nearby survey coverage and where no cultural properties had been recorded. Because none of the links has been entirely inventoried, no areas with *no* initial impacts were defined.

Proposed Route – TEP1 (Link S1), A1 (Links T1, T2, T3, and T4), River 1 (Link R1)

Initial moderate impacts to cultural resources would likely occur along this route where 15 archaeological sites may be present including major sites near the San Francisco River. Link T4 also is within foreground views of ADOT Bridge #8150. Low impacts to the visual setting of this bridge would occur because Link T4 would parallel the existing AEPCO 230kV line. Low visual impacts to the setting of historic roads and railroads also may occur because they are within foreground views along portions of the route, but like ADOT Bridge #8150, their settings are already compromised by the presence of the existing AEPCO 230kV line. The importance (eligibility for listing on the National Register) of these linear properties has yet to be conducted.

It is reasonable to assume that the application of appropriate property-specific mitigation measures will result in negligible levels of residual impact. Property-specific mitigation to offset the negative effects of physical disturbance to archaeological sites ordinarily involves (1) siting of the transmission line in specific locations to avoid or minimize disturbance to the extent possible, (2) development and implementation of a research design for data recovery of a representative sample of data from the sites prior to project installation, and (3) commitment to a plan for avoiding intentional or inadvertent disturbance to preserved sites during project installation and subsequent maintenance.

Mitigation of visual impacts would include measures discussed in Appendix B, as well as archival research and photographic and other documentation of the affected historic property.

Should any traditional cultural places or sacred sites be identified during ongoing BLM consultation efforts, the BLM would work directly with the concerned tribal group (or other traditional community) to ensure avoidance or appropriate mitigation.

Alternative Routes - TEP3 (Links S3 and S4), A3 (Links T1, T2, P2), A4 (Links T1, P1, and P2), River 3 (Link R3), and River 2 (Link R2)

Initial moderate impacts to cultural resources would likely occur along these routes because both major and less substantial archaeological sites are anticipated to be present. Additionally, the Old Safford-Clifton Road along Link P2 would be traversed and consultation regarding the National Register eligibility of this linear property has yet to be conducted. Moderate impacts to the visual setting of this highway could occur because of strong project contrast to the natural setting. Currently no existing similar structures exist along this portion of the Old Safford-Clifton Road. Link R2 would avoid ADOT Bridge #8150, but occur within foreground views of other historic roads and railroads.

Regardless of the level of initial impacts along any of the alternative routes, however, it is reasonable to assume that the application of appropriate property-specific mitigation measures, such as those listed for the proposed route, likely will result in acceptable or even negligible levels of residual impact. A possible exception might be visual impacts to the Old Safford-Clifton Road along Link P2.

BIOLOGICAL RESOURCES

Biological resources included in the impact assessment were vegetation types, special status species, and wildlife species. Vegetation types were generally ranked as having low sensitivity with the exception of wash vegetation and riparian habitat. Wash vegetation, or xeriparian habitat, was ranked as having moderate sensitivity and riparian habitat as having high sensitivity. No occurrences of special status species are known within the study area. A Biological Evaluation was completed for the Arizona hedgehog cactus along the proposed route and is currently being reviewed by the BLM for concurrence of a no adverse effect designation.

Vegetation Types and Associated Wildlife

Impacts associated with the proposed and alternative routes are associated with ground disturbance and human access. Ground disturbance occurring during construction of the proposed action would result from upgrading or building access and spur roads, placing tower footings, utilizing areas adjacent to the right-of-way for stockpiling equipment, and wire pulling sites. Permanent loss of habitat would be restricted to tower placement sites and along new access roads. There could be short-term loss of

vegetation due to trampling and soil compaction in the immediate vicinity of construction. Xeriparian habitats, which occur along dry washes throughout the study area, provide shelter for numerous desert and grassland species. Most of these washes are narrow and can be easily spanned by the conductors, reducing the potential for loss of xeriparian habitat. Riparian habitat exists along the San Francisco River. There would be no loss of such habitat, as the conductors will span the river and the structures will be placed high above and outside the river corridor. The addition of more conductors across the San Francisco River may potentially affect migratory bird flight patterns. Revegetation of disturbed areas after construction of the proposed action would reduce the potential loss of biodiversity.

Wildlife

Increased noise and activity levels during construction of the proposed action 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. There could also be a loss of burrows and nests for ground-dwelling species. Big game species, including mule deer and javelina, utilize open washes as movement corridors throughout the study area. The proposed action would not constitute a barrier to wildlife movement after construction and habitat fragmentation would not occur.

Special Status Species

FWS and AGFD identified several special status species as potentially occurring within the study area (Appendix E, Table E-1), although no populations were located. Suitable habitat for such species was limited as well.

Several plants along the proposed and alternative routes are protected by the Arizona Native Plant Law. These include mesquite, ocotillo, and all species of cacti. Most of these could be avoided and impacts would not be significant following mitigation. If avoidance of such species is not possible, these plants would be salvaged according to guidelines agreed upon by the State Department of Agriculture and the BLM.

The Arizona hedgehog cactus was identified as potentially occurring along the San Francisco River (Links R1 and R2). The hills are rocky and steeply sloped along the banks of the river. A field survey was conducted and no individual Arizona hedgehog cacti were located along the proposed route.

No-action Alternative

No impacts would occur to biological or wildlife resources with the selection of this alternative.

Proposed Route – TEP1 (Link S1), A1 (Links T1, T2, T3, and T4), River 1 (Link R1)

No significant adverse impacts to vegetation are associated with the construction of this route. The proposed transmission line will span several washes and the San Francisco River. No loss of riparian habitat will result with the selection of this route. Mitigation designed to prevent construction materials from entering the river will be implemented, which will reduce the potential effects to the aquatic habitat.

Alternative Routes - TEP3 (Links S3 and S4), A3 (Links T1, T2, P2), A4 (Links T1, P1, and P2), River 3 (Link R3), and River 2 (Link R2)

Impacts associated with these alternative routes are expected to be low because ground disturbing activities will be held to a minimum as a result of existing access being available for the majority of the routes. In those areas where existing access is not available (i.e., Link R2), moderate impacts to wildlife habitat would likely occur.

SOCIOECONOMICS

No-action Alternative

Selection of the no-action alternative would result in loss of short-term economic and employment benefits of transmission line construction.

Proposed and Alternative Routes

For the proposed and alternative routes, the discussion regarding potential socioeconomic impacts for each is combined as there are more similarities between each route than there are differences.

In general, the effects of power lines on existing social structures and economic activities are relatively small. Social and economic issues associated with the construction of the proposed action include potential effects from the influx of construction workers, disruption of land-based economic activities (i.e., grazing), and right-of-way compensation. Impacts related to construction are typically minimal due to the small size and short-term work force characteristics of transmission line construction.

Social and Economic

The demand for temporary accommodations during construction would depend on the workers' place of residence. Given the relatively small size of the work force, it is expected that existing facilities should be adequate to provide temporary accommodations. Local communities of Clifton, Morenci, and Three Way would benefit from purchases by construction workers during the construction phase of the project. However, since the construction work force associated with this project is expected to be relatively small and mobile, the impact of these expenditures to the study area economy is expected to be minimal and would not materially alter the overall trends of the regional economy.

Potential long-term impacts include acquisition of additional right-of-way. All properties acquired for right-of-way purposes would be in accordance with applicable federal, state, and local laws and regulations. Property owners, where practical, would be reimbursed according to fair market value of the property. Land value and improvements on properties needed for right-of-way would be assessed on a case-by-case basis where applicable. In addition to right-of-way payments to private landowners, the BLM and ASLD receive right-of-way payments on federal and state lands, respectively.

There would be no impact to electric utility rates or increase in rates from the proposed action. The project would be funded through MW&E capital improvement program; therefore, local customers would not absorb costs.

Fiscal

Revenues to local taxing jurisdictions may be generated through local sales taxes on purchases made by construction personnel during the construction phase of the project. However, these revenues are generally small and transitory.

In addition to payments to private property owners for right-of-way leases or in-fee purchases, the BLM and ASLD would receive right-of-way payments on federal and state lands, respectively, and distribute part of these revenues to Greenlee County.

Impacts on Minority and Low Income Communities

Presidential Executive Order 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 populations and low-income populations. No disproportionately high or adverse environmental impacts on Native Americans, minority or low-

income communities in Morenci and Clifton are anticipated to occur. Appendix A describes the public contact activities that occurred to ensure that appropriate notification and an opportunity to comment on the proposed action was provided.

EARTH AND WATER RESOURCES

Of concern to earth and water resources is the increase in soil erosion, loss of topsoil, loss of soil productivity, and changes in surface water quality due to construction activities. Those areas where soils have moderate or high erosion hazards may be prone to increased erosion when disturbed by these construction activities. Increased soil erosion may cause loss of topsoil, loss of vegetation, and increased sedimentation into streams. Increased sedimentation in streams may affect water quality and fish habitat, and clog irrigation and public drinking water supply systems. However, with reclamation and mitigation to reduce ground surface disturbance and protect vegetation, impacts to soils and water resources are expected to be minimal. Also, to reduce impacts to water resources, construction activities should avoid disturbance in floodplains and in areas where streams have perennial flow. These areas should be spanned by placing of the towers away from the streambanks. Adherence to U.S. Army Corps of Engineers permit requirements and certifications under Sections 404, 402, and 401 of the Clean Water Act is expected to result in minimal impacts to floodplains and water resources. No adverse impact to mineral resources are anticipated.

Adherence to the proposed general and specific recommended mitigation measures along with rules and regulations that protect water quality is expected to result in minimal to no adverse impacts.

No-action Alternative

Under the no-action alternative, the project would not be built so there would not be any impacts to earth and water resources.

Proposed Route – TEP1 (Link S1), A1 (Links T1, T2, T3, and T4), River 1 (Link R1)

Soils with slight (0.74 mile) to moderate (0.45 mile) erosion potential are crossed by Link S1. A moderate impact may occur in those areas where the soils may be subject to increased erosion due to additional access roads and construction activities for structure placement. The route also crosses Willow Creek and other unnamed drainages. These drainages will be spanned by the transmission line. Initial impacts of low to moderate are anticipated but with mitigation should be reduced to low.

Soils with slight (0.72 mile) to moderate (5.95 miles) erosion potential and some small areas with high erosion potential in the washes are crossed by Links T1, T2, T3, and T4. Link T2 crosses a total

of 0.4 mile of 100-year floodplain of Cold Creek. The potential initial impacts along this route are moderate but with adherence to mitigation, impacts should be reduced to low or no impact.

Soils with moderate erosion hazard potential are crossed by Link R1. The potential initial impact is moderate but with adherence to mitigation, impacts should be reduced to low. The crossing of the San Francisco River is about 0.12 mile wide. The potential initial impact is moderate but with mitigation, the impact should be reduced to low.

Alternative Routes - TEP3 (Links S3 and S4), A3 (Links T1, T2, P2), A4 (Links T1, P1, and P2), River 3 (Link R3), and River 2 (Link R2)

Impacts along Links S2 and S3 are the same as Link S1; however, Links S2 and S3 are longer by 0.37 mile. Links T1, T2, P1, P2 crosses soils with slight (2.15 miles) to moderate (6.95 miles) erosion hazard potential. The potential initial impact is moderate but with adherence to mitigation measures, impacts should be reduced to low. Link S2 and S3 crosses a total of 0.39 mile of 100-year floodplain of intermittent washes and 0.25 mile of 100-year floodplain of Cold Creek. Initial impacts are low to moderate but with mitigation, initial impacts should be reduced to low or no impact. The 100-year floodplain of the San Francisco River is crossed by Link R3 for a distance of about 0.16 mile. This perennial stream is crossed perpendicular to flow and along with other mitigation, the initial moderate impact will be reduced to low. The soils along the route have a moderate (1.1 miles) erosion hazard with a high erosion hazard along the floodplain of the San Francisco River. The potential initial impact is moderate but with mitigation should be reduced to low.

Soils with moderate erosion hazards are crossed by Link R2 for 2.92 miles. Some of the soils at the San Francisco River crossing may have high erosion hazards. The potential initial impact is moderate but with mitigation is reduced to low. The crossing of the San Francisco River along Link R2 is about 0.15 mile wide. Potential initial impacts are moderate but should be reduced to low with adherence to mitigation measures.

AIR QUALITY AND NOISE

No-action Alternative

No impacts to air quality and noise will occur with the selection of this alternative.

Proposed and Alternative Routes

For the proposed and alternative routes, the discussion regarding potential impacts to air quality and noise is combined as there are more similarities between each route than there are differences.

The construction phase of the transmission line would include overland access, where practical, structure site clearing and installation, conductor pulling, material hauling, and cleanup. Temporary air pollutant emissions to air quality (9 to 12 months) would include fugitive dust from construction activities and nitrogen oxides, carbon monoxide, hydrocarbons, and sulfur oxides from construction equipment exhaust emissions. The proposed action would not generate measurable amounts of regulated air pollutants after completion of construction. Dust control could be accomplished by limiting the amount of traffic, monitoring vehicle speeds on dirt roads during construction, and watering (where necessary). All air pollutant emissions are temporary and would disperse quickly.

Impacts to ambient noise would be similar, increasing primarily during the construction phase. Noise impacts would be limited to working hours. After completion of construction, noise impacts would be limited to vehicles used for periodic maintenance activities.

CUMULATIVE IMPACTS

Cumulative impacts to the environment result from the incremental impact of the proposed action when added to other past, present, and foreseeable future actions regardless of what agency (federal or non-federal) or person is undertaking them. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time (40 CFR 1508.7). Reasonable foreseeable future actions consist of projects, actions, or developments that can be projected with a reasonable degree of confidence to occur within a defined time frame and that will impact the same, or portions of the same, resource. An analysis of cumulative impacts was performed for those resources that were found to have some long-term adverse effect on the environment.

The following steps were taken to analyze cumulative impacts for the proposed action:

- The area of influence for the analysis of cumulative effects was defined for each resource to include the study area.
- The kinds of impacts for other past and existing actions were determined for each resource. Past actions were evaluated for one to five years depending on the types of action or resource affected and data available.
- Other reasonable foreseeable future actions with potential impacts on the same resource categories were then identified and screened. Future actions were evaluated for their status and feasibility. The projected impacts of these actions were determined based on the best available information and through consultation with key planning agencies or the project proponent.

Anticipated development within the study area is described in Table 4.

TABLE 4 REGIONAL CUMULATIVE PROJECTS			
Project Type	Location	Description	Area/Length
Foreseeable Future			
Morenci Land Exchange	Morenci	Mine expansion	4,090 acres
Safford Land Exchange	Safford	Mine expansion	17,000 acres
US 191 – Clifton to Morenci	Clifton	Reconstruct roadway	Approximately 1 mile
US 191, SR 75, 78, Ward Canyon Bridge	Threeway	Intersection improvement and bridge replacement	Milepost 151.0 to Milepost 152.0
US 191	South of Threeway	Road widening project	Milepost 144.07 to Milepost 154.52
Present			
Greenlee Mountain Ranchettes	Northeast of Loma Linda	Private development of 40-acre parcels northeast of Loma Linda.	112 parcels
Past			
Duncan Valley Electric Cooperative	Loma Linda	Distribution line along Links S4, T1, T2 (south side) servicing Loma Linda and ranchette parcels	Approximately 7 to 9 miles of distribution line construction

The cumulative impacts, according to the specific resources evaluated for this assessment, include the following.

Land Use

Increased access and improvement of existing access roads associated with the implementation of regional projects may result in higher numbers of vehicular traffic in the study area. Consequently, impacts to recreational activities, wildlife habitat, water quality, and cultural sites may increase. This could both directly and indirectly affect resource management policies within and near the study area.

Long-term impacts to available grazing land resulting from the implementation of regional projects (i.e., land exchanges) are expected to occur.

Visual Resources

Cumulative impacts to visual resources could result from other projects in the study area. ADOT road improvements and upgrades would likely impact the scenic quality along state routes and state highways in the study area with increases in road cuts along these travel routes. Impacts to scenic

quality as a result of private projects (i.e., residential and mining) are expected to occur with increases in the removal of native vegetation. This removal would expose mineral soil that would likely contrast with the surrounding natural setting. Additionally, any potential future plans to increase the footprint of the Morenci Mine would increase the height and mass of the existing stockpiles, resulting in more visible landforms.

Cultural Resources

Approximately 50,000 cultural properties (the vast majority, archaeological sites valued primarily for their information potential) have been recorded and tabulated at major facilities throughout the state of Arizona, but just a small percentage of the state has been subjected to systematic surveys. Perhaps as many as several million sites are estimated to exist within the state. Because of the extent of federal and state land throughout Arizona, most actions with the potential to affect cultural resources are carried out in compliance with federal or state historic preservation legislation; federal legislation also requires treatment of cultural properties on private lands when federal actions may affect them. Thus, affected properties ordinarily are appropriately treated prior to the implementation of proposed federal and state undertakings.

Implementation of the proposed or alternative routes has the potential to disturb an estimated 15 archaeological sites. In fact, however, many of these sites likely could be avoided and preserved in place. Nonetheless, mitigative data recovery (and archival research for historic sites) might be necessary in some cases. In that case, at least a few archaeological sites might be partially removed, although their informational value will contribute to increased understanding of past cultural traditions. In consideration of these potentials, cumulative impacts are viewed as minimal.

Biological Resources

Cumulative impacts will be in one of two categories, either loss of habitat or increased access into unused areas. The proposed action will result in minimal effects. Habitat loss will be restricted to structure placement sites and spur roads. The study area is within a region where rural subdivisions have recently been constructed or are planned for in the foreseeable future. Two land exchanges are also underway in the region that were initiated by PDMI. These actions will result in a cumulative loss of desert vegetation and habitat for wildlife species. The increased human population associated with subdivisions also increases the potential for harassment of wildlife, either intentional or accidental.

Earth and Water Resources

The construction of the proposed action is expected to have minimal additional impacts. With other residential and commercial development in the area, there is expected to be an increase in vehicular

on-road and off-road traffic. Increased access for off-road vehicles could lead to degradation of water quality from increased soil erosion and possible increases in sediments and other pollutants into the perennial and intermittent streams. Construction activities related to ADOT projects could cause at least short-term increases in soil erosion and potential degradation of surface water quality. However, these projects also include mitigation measures to reduce adverse impacts to earth and water resources.

Socioeconomics

Cumulative projects in the region will result in additional positive economic impacts. Locally, there would be increased revenues associated with purchases of goods and services during construction and long term operations of future projects.

Air Quality and Noise

Air quality and noise impacts may occur with the selection of the proposed action. However, the incremental impacts that result from the proposed action will have no significant level of cumulative impact. Cumulative impacts on air and noise resources as a result of the proposed action are expected to be directly related to the temporary periods of construction. Additional dust and noise emissions with the implementation of regional projects are not expected to exceed existing regulations. Regardless of the level of initial impacts along any of the alternative routes, however, it is reasonable to assume that the application of appropriate property-specific mitigation measures, such as those listed for the proposed route, likely will result in acceptable or even negligible levels of residual impact.

CHAPTER 5 - CONSULTATION AND COORDINATION

AGENCIES, TRIBES, AND ORGANIZATIONS CONSULTED

Federal

U.S. Department of Agriculture
Natural Resources Conservation Service
Arizona State Office, Phoenix, Arizona

U.S. Department of Interior
Bureau of Land Management
Safford Field Office, Safford, Arizona
U.S. Fish and Wildlife Service
Phoenix, Arizona Office

Federal Aviation Administration
Southwest Pacific Region, California

Native Americans

Ak-Chin Indian Community
Maricopa, Arizona

Gila River Indian Community
Sacaton, Arizona

Hopi Tribe
Kykotsmovi, Arizona

Salt River Pima-Maricopa Indian Community
Scottsdale, Arizona

San Carlos Apache Tribe
San Carlos, Arizona

Tohono O'odham Nation
Sells, Arizona

White Mountain Apache Tribe
Fort Apache Indian Reservation
White Mountain, Arizona

Zuni Tribe
Zuni, New Mexico

State

Arizona Department of Commerce
Population Statistics Unit, Phoenix, Arizona

Arizona Department of Economic Security
Phoenix, Arizona

Arizona Department of Transportation
Roadside Development, Phoenix, Arizona
Highways Division, Phoenix, Arizona

Arizona Game & Fish Department
Phoenix, Arizona

Arizona State Historic Preservation Office
Phoenix, Arizona

Arizona State Museum
University of Arizona, Tucson, Arizona

Arizona State University
Department of Anthropology, Tempe, Arizona

City and County

Greenlee County
Planning and Development Department
Clifton, Arizona

Town of Clifton
Clifton, Arizona

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APPENDICES

APPENDIX A
PUBLIC INVOLVEMENT

FACT SHEET

FACT SHEET

Morenci Water & Electric

Project Description

The Bureau of Land Management (BLM) Safford Field Office will be directing the preparation of a third-party environmental assessment (EA) in compliance with the National Environmental Policy Act (NEPA) to analyze the potential impacts related to the construction and operation of the proposed Greenlee to Morenci 345kV Transmission Line Project. Morenci Water & Electric (MW&E) is proposing to build and operate approximately 14 miles of 345 kilovolt (kV) transmission line from Greenlee Substation (east of Three Way) to Morenci, Arizona. The proposed transmission line structure is a wooden H-Frame structure, typically 75 to 80 feet above ground, spaced 700 to 1,000 feet apart. The project would improve transmission line reliability to MW&E customers and maintain competitive pricing for electric power.

Appropriate federal, state, county, and local agencies and public interest groups will be contacted and consulted throughout the EA process. The objectives of the EA and related activities will be to study and assess the potential impacts of the proposed project on various environmental resources including biological (e.g., threatened or endangered species), cultural, visual, land use, socio-economic, geology, soils, and water.

The accompanying map shows the proposed project study area and the alternatives selected for further evaluation.

Public Participation and Environmental Analysis Process

The process of conducting environmental and engineering studies to identify a suitable location for the project is ongoing. Studies are being conducted in cooperation with the BLM to determine the location of corridors suitable for this type of use. Alternative transmission line corridors have been identified. The BLM is seeking comments on the alternatives from the public; federal, state, and local agencies; and potentially affected landowners for this project.

The EA will be prepared by Dames & Moore, an environmental consulting firm, under the direction of the BLM. Environmental and engineering studies are currently being conducted to identify and evaluate the proposed project alternatives including a "no-action" alternative.

The purpose of this fact sheet is to give you an opportunity, early in the process, to comment on the proposed project. Comments must be received by February 15, 1999. A self-addressed comment form is included with this fact sheet to provide any comments you have on the project.

In addition to this fact sheet, a public open house is being held to discuss the proposed project and EA. This meeting will be held at the following time and location:

January 28, 1999
4:30 to 7:30 p.m.
Clifton High School
(Cafeteria)

We look forward to your comments. If you need additional information or if you have questions concerning the project, please contact:

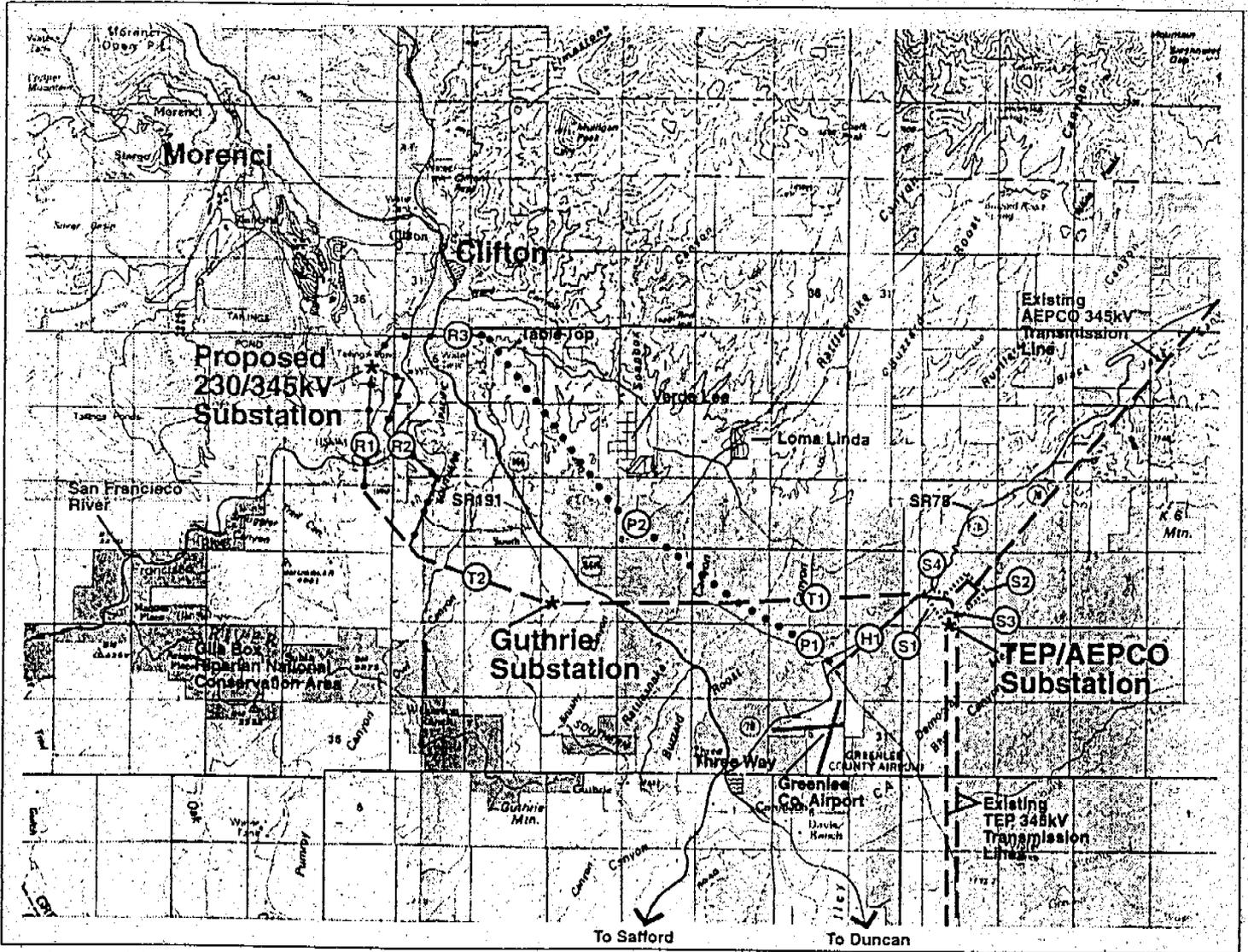
Scott Evans
Bureau of Land Management
Safford Field Office
(520) 348-4414
E-mail: sevans@az.blm.gov.com

or

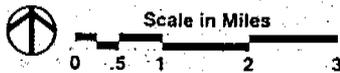
Richard Knox
Dames & Moore
Phoenix
(602) 371-1110

Personas quien hablan español se pueden poner en contacto con Scott Evans a BLM
(520) 348-4414
E-mail: sevans@az.blm.gov.com

January 1999



Dames & Moore
January 1999



Vicinity and Alternatives Map

Greenlee to Morenci 345kV
Transmission Line Project
Environmental Assessment
Morenci Water & Electric

Key

- — — Existing 230kV alignment
- Existing natural gas pipeline alignment
- San Francisco River crossing alternatives
- TEP/AEPCO substation alternatives

Greenlee to Morenci 345kV
Transmission Line Project
Environmental Assessment
Morenci Water & Electric
January 1999

Scott Evans
BLM, Safford Field Office
711 14th Avenue
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Greenlee to Morenci 345kV
Transmission Line Project
Environmental Assessment
Morenci Water & Electric
January 1999

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PUBLIC INVOLVEMENT INFORMATION

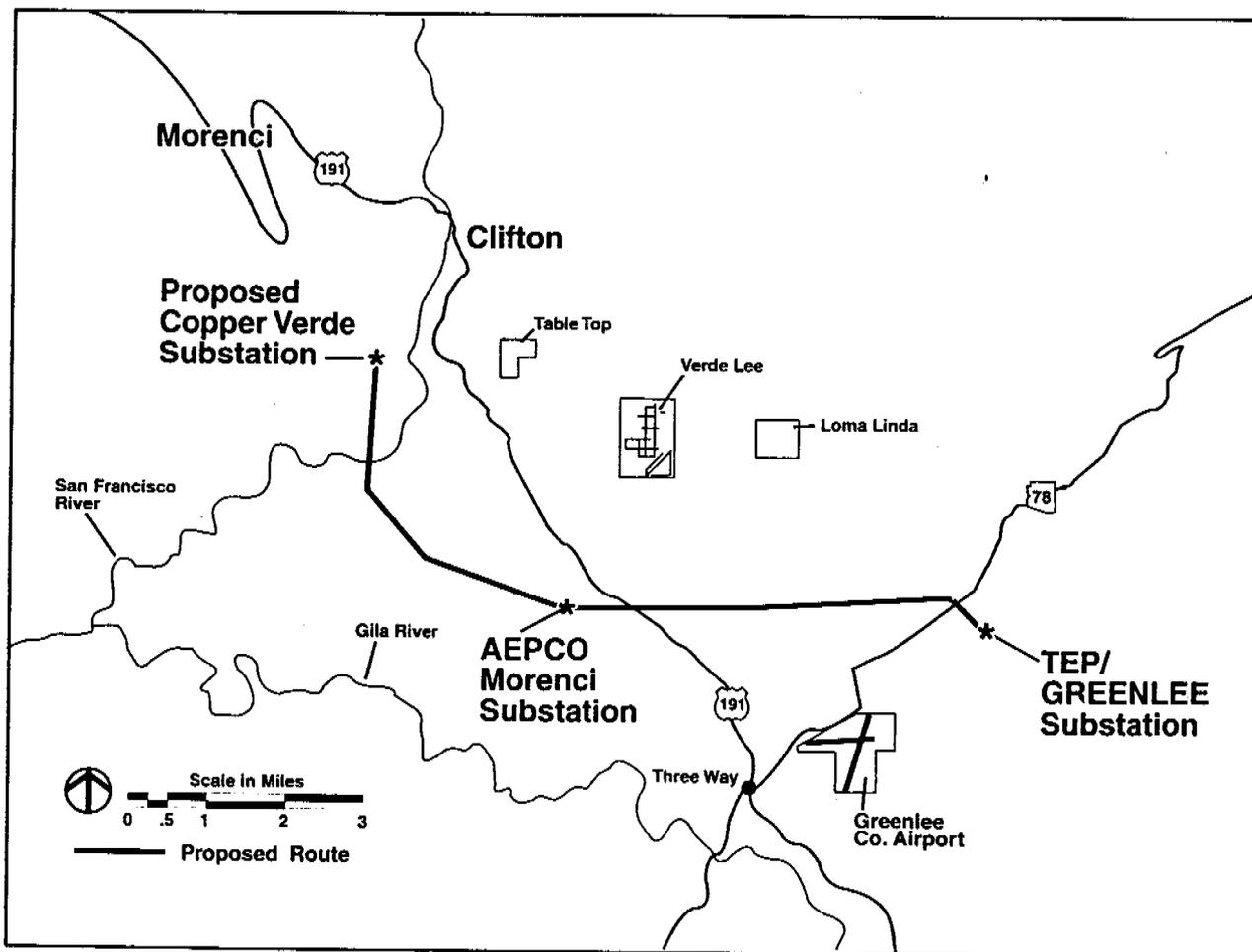
PUBLIC NOTICE

The Bureau of Land Management (BLM), Safford Field Office, has prepared an environmental assessment (EA) for a proposed 345kV transmission line right-of-way from the Tucson Electric Power (TEP) Greenlee Substation to the proposed Copper Verde Substation south of Morenci, Arizona (approximately 11 miles). Copies of the EA are located at the Clifton and Safford libraries for public review.

The public is invited to review the EA and submit comments to the BLM. Comments must be received or postmarked by the comment closing date of August 23, 1999. Written comments may be submitted to:

Scott Evans, Project Manager
Bureau of Land Management
Safford Field Office
711 14th Avenue
Safford, Arizona 85546

For additional information, please call Scott Evans at (520) 348-4414.



**Morenci Water and Electric
345kV Intertie Project**

BLM Open House to Address Proposed Transmission Line

The Bureau of Land Management (BLM) Safford Field Office will conduct an open house to inform and receive comments from the public about an environmental assessment (EA) to address the development of a proposed 345,000-volt transmission line. Morenci Water & Electric (MW&E) proposes to construct a 14-mile transmission line from the Tucson Electric Power Greenlee Substation to Morenci, Arizona. MW&E is requesting public input at this early stage of the EA process to identify potential issues and concerns.

The EA process will address public and agency concerns; identify potential environmental impacts of development on natural, human and cultural resources; and assess and compare alternatives to and for the transmission line.

The open house will be held in Clifton on January 28, 1999 at the Clifton High School Cafeteria, 110 High Street, 4:30 to 7:30 pm. The open house will be informal for the public to review project displays and discuss the process individually with project team members.

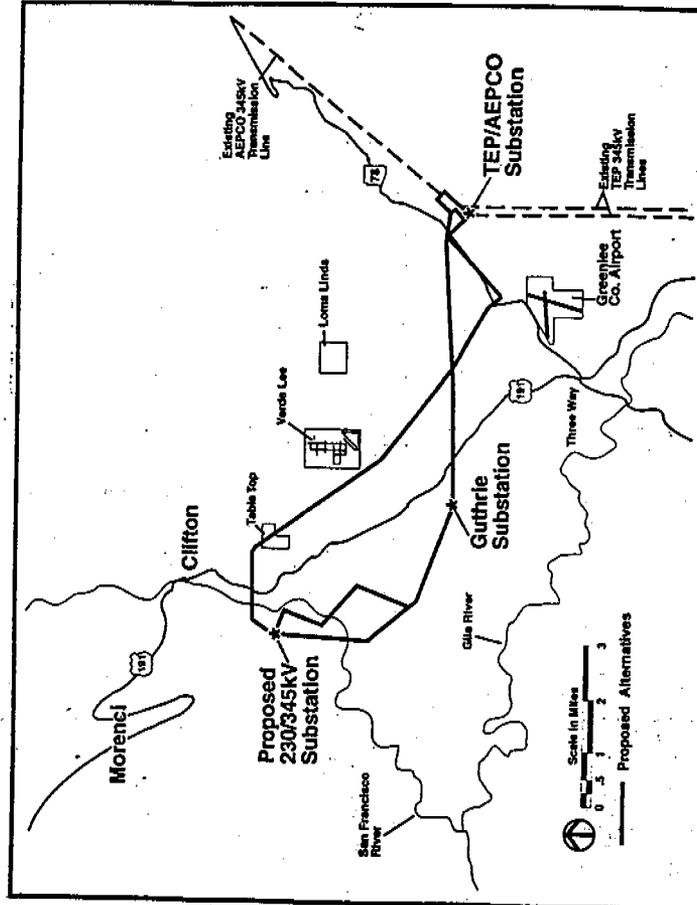
Written comments will be accepted until February 15, 1999.

Mail comments to: Bureau of Land Management
Safford Field Office

711 South 14th Avenue

Safford, Arizona 85546.

If you have any questions about the open house, please call Scott Evans at (520) 348-4414.



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Eastern Arizona

COURIER

Wed., Jan. 27, 1999 Vol. 111, No. 4 28 Pgs. - 2 Sec. & T.V. Guide

Safford, Arizona

50 Cents

Eastern Arizona

COURIER

Wed., Jan. 20, 1999 Vol. 111, No. 3 26 Pgs. - 2 Sec. & T.V. Guide

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APPENDIX B
MITIGATION MEASURES

APPENDIX B - MITIGATION MEASURES

TABLE B-1 STANDARD 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., marshaling 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 lab 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.	An initial intensive cultural resource inventory survey is to be conducted in conjunction with preparation of the EA. Impact avoidance and mitigation measures developed in consultation with appropriate land managing and regulatory agencies and other interested parties will be implemented during post-EA phases of project implementation. In addition, supplemental surveys of appurtenant impact zones beyond the corridor, such as new access roads and construction yards, will be undertaken as needed.
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. The line will be designed to the best modern standards to minimize the possibility of line-generated radio or television interference.
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.	Roads will be built, as near as possible, at right angles to streams and washes. Culverts will be installed where necessary. 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, road construction will include dust-control measures during construction 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.
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 trash (cleared trees, etc.) will not be allowed on BLM administered lands.

**TABLE B-1
STANDARD MITIGATION MEASURES**

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 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 trash. All construction waste including trash, 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 (Raptor Research Foundation, Inc. 1991).
17.	Third-party environmental compliance will be required throughout the construction effort, from clearing through rehabilitation.
18.	Species protected by the Arizona Native Plant Law will be avoided or 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"> ■ removal and stockpiling for replanting on site ■ removal and transplanting out of surface disturbance area ■ removal and salvage by private individuals ■ removal and salvage by commercial dealers ■ any combination of the above

TABLE B-2
SELECTIVELY RECOMMENDED MITIGATION MEASURES

Note: These selective mitigation measures apply only to specific locations that may be identified in the EA or during field investigations and recorded in the specific plan of development.

1. No widening or upgrading of existing access roads will be undertaken in the area of construction and operation, except for repairs necessary to make roads passable, where soils or vegetation are very sensitive to disturbance.
2. There will be no blading of new access roads in the area of construction and operation. Existing crossings will be utilized at rivers, perennial streams, and irrigation channels. These access routes must be flagged with an easily seen marker and the route must be approved by the authorized officer in advance of use.
3. 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.
4. 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.
5. Modified structure design will be utilized to minimize ground disturbance, operational conflicts, visual contrast, or avian conflicts.
6. In designated areas, structures will be placed or rerouted so as to avoid sensitive features such as, but not limited to, riparian areas, water courses, and cultural sites, or to allow conductors to clearly span the features, within limits of standard tower design. This would minimize the amount of disturbance to the sensitive feature or reduce visual contrast.
7. Standard structure design will be modified to correspond with spacing of existing transmission line structures where feasible. This would reduce visual contrast or potential operational conflicts.
8. At highway, canyon, and trail crossings, structures are to be placed at the maximum feasible distance from the crossing to reduce visual impacts.
9. Non-specular conductors will be utilized to reduce visual impacts
10. With the exception of emergency repair situations, right-of-way construction, restoration, maintenance, and termination, activities in designated areas will be modified or discontinued during sensitive periods (e.g., nesting and breeding periods) for candidate, proposed threatened and endangered, or other sensitive animal species. This list will be approved in advance by the authorized officer of the BLM.
11. Surface disturbing activities will be limited in the areas of critical concern for any special status species.
12. Transmission line structures will comply with Federal Aviation Administration Guidelines to minimize aircraft hazards (Federal Aviation Part 77).

APPENDIX C
VISUAL RESOURCES

APPENDIX C – VISUAL RESOURCES

This appendix supports the visual resources inventory and assessment. Included are an overview of the methods and criteria, impact types and levels, and BLM VRM classifications.

METHODS AND CRITERIA

The goal of the visual assessment is to qualify and quantify potential visual impacts resulting from the introduction of the proposed action into the landscape, and to identify the alternative route that minimizes the degree of project contrast of the proposed facilities with the aesthetic values of the surrounding landscape. This is accomplished by (1) characterizing the aesthetic values of the landscape along the proposed and alternative routes, (2) establishing the visibility of facilities to viewers and depicting the appearance of facilities to viewers, (3) assessing the visual contrast and impacts of facilities, and (4) identifying mitigation measures that will lower visual contrast where possible.

Visual contrast is a measure of the degree of perceived change that would occur in the landscape due to the construction and operation of the proposed project. Visual contrast typically results from (1) landform modifications which 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. Three distance zones were used to assess visual impacts of the proposed action—foreground (0 to ½ mile), middleground (½ to 1 mile), and background (1 to 2 miles).

IMPACT TYPES AND LEVELS

Impacts to key observation points or viewers could range from low to high based on (1) visibility of the proposed project, including distance from viewers, screening potential, and terrain factors that may affect visibility; (2) scenic quality of the landscape; and (3) visual contrast with existing visual conditions.

Low impacts to viewers are anticipated for a majority of the study area crossed by the proposed and alternative routes. Low impacts occur most often in the following situations: (1) areas seldom seen or in background viewing areas (e.g., portions of the study area, which are very sparsely populated and where alternatives avoid new crossings of major travel routes); and (2) locations where the proposed project would be visible in the middleground (i.e., 0.5 to 1 miles) and background (i.e., beyond 2 miles) landscape settings modified by existing transmission lines (e.g., AEPCO's 230kV).

Moderate viewer impacts would occur most often in the following situations: (1) locations where the proposed project would cross previously undisturbed landscapes that are within

middleground to background viewing areas (e.g., Link P2); and (2) where foreground views of the proposed project would parallel existing pipeline corridors (e.g., Links P1 and P2).

Areas of high viewer impact would only occur in areas where the proposed project would be located in a new corridor and would be visible in foreground or near middleground areas without the implementation of selectively recommended mitigation measures. No high impacts to viewers were identified for the proposed project. Visual impacts to sensitive viewpoints would not be significant with the implementation of selectively recommended mitigation measures.

Table C-1 identifies inventoried sensitive viewpoints found within the study area.

TABLE C-1 KEY OBSERVATION POINTS AND VIEWER SENSITIVITY LEVELS	
KOPs	Sensitivity Level
Residences – Existing	High
Recreation Sites – Existing	High
Gila Box RNCA	High
San Francisco River	High
Black Hills Back Country Byway (cultural/recreation)	High
Old Railroad Grade #1 (cultural)	High
Old Railroad Grade #2 (cultural)	High
Solomonville Overpass Bridge #1 (cultural)	High
Solomonville Overpass Bridge #2 (cultural)	High
US 191	Moderate
SR 78	Moderate
Skyline Drive Road	Moderate
Other Secondary Travel Routes	Moderate
Residences - Future (concept)	Moderate
Recreation - Future (concept)	Moderate

AGENCY VISUAL MANAGEMENT CLASSIFICATIONS

VRM classifications and definitions are provided on Table C-2. Scenic Quality Class definitions are provided on Table C-3.

The following pages contain SQRU forms that were used to characterize the scenic quality of the study area. Those values underlined in the scenic quality rating box depict assigned values for each natural amenity (landform, water, etc.) or discordant intrusion (cultural modifications). The combined total for the amenities and/or intrusions can be referenced in the scenic quality classification box. The scenic quality map (Figure C-1) can be found after the SQRU forms, and should be used in conjunction with the SQRU forms.

**TABLE C-2
BLM VISUAL RESOURCE MANAGEMENT CLASSES**

Class I: 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: 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: 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: The objective of this class is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

Class V: No longer used.

Source: BLM Manual, Appendix 2, 01/17/86

**TABLE C-3
SCENIC QUALITY CLASS DEFINITIONS**

Scenic Quality Classes	Description
Class A	Outstanding areas where characteristic features of landform, rock, water, and vegetation are distinctive or unique in the context of the surrounding region. These features exhibit considerable variety in form, line, color, and texture.
Class B	Above average areas in which features provide variety in form, line, color, and texture and, although the combinations are not rare in the surrounding region, they provide sufficient visual diversity to be considered moderately distinctive.
Class C	Common areas where characteristic features have little variation in form, line, color, or texture in relation to the surrounding region.

SCENIC QUALITY RATING FORM
MW&E 345kV Intertie Project

SQRU Number

Scenic Quality Class/Total

Photograph Location Key

Scenic Quality Rating

Landform	H (5)	<u>H/M (4)</u>	M (3)	M/L (2)	L (1)
Vegetation	H (5)	H/M (4)	<u>M (3)</u>	M/L (2)	L (1)
Water	H (5)	H/M (4)	<u>M (3)</u>	M/L (1)	L (0)
Color	H (5)	H/M (4)	<u>M (3)</u>	M/L (2)	L (1)
Adjacent Scenery	H (5)	H/M (4)	M (3)	<u>M/L (1)</u>	L (0)
Scarcity	H (5)	H/M (4)	M (3)	<u>M/L (2)</u>	L (1)
Modifications*	H (2)	H/M (1)	M (0)	<u>M/L (-2)</u>	L (-4)

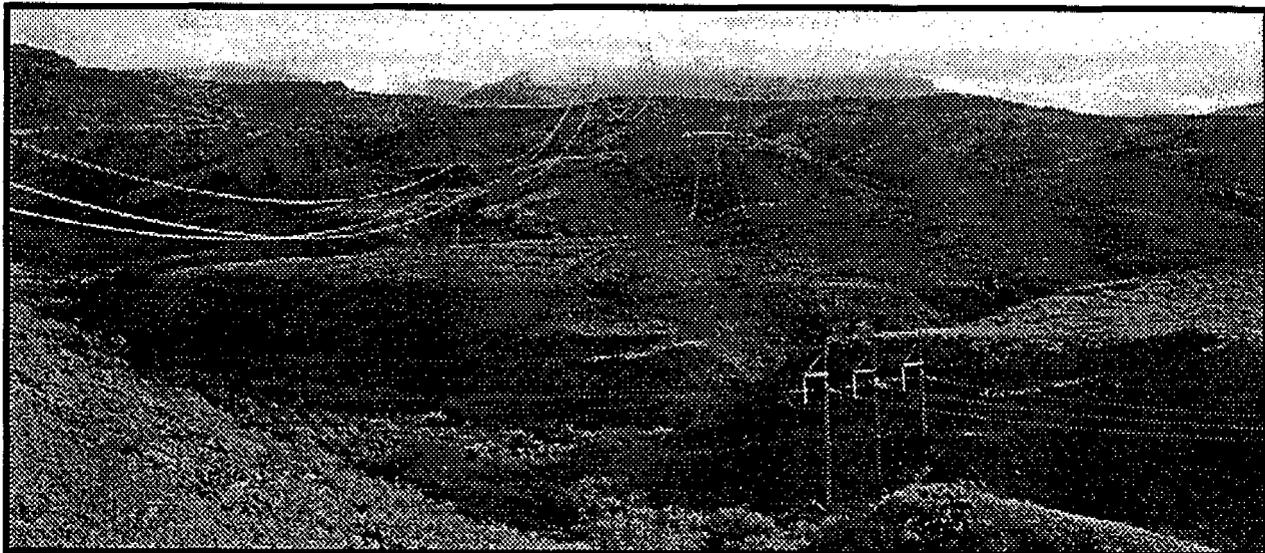
Scenic Quality Classification:
A = 19 or more
B = 12 to 18
C = 11 or less

*Describes cultural modifications to the landscape ranging from discordant intrusions (-4) to favorably increasing the visual variety and promoting visual harmony (2).

Narrative Landscape Description

The terrain is moderately varied with canyons and drainages that offer some distinctive qualities to the natural setting. Desert grasslands and intermittent riparian deciduous species add additional color and texture characteristics to the setting with intermittent seasonal color changes with the riparian corridor. Waterform is present in the form of ephemeral streams and intermittent riparian stringers that add additional qualities to the setting. Cultural modifications include a number of high voltage transmission lines and access roads.

Photograph



SCENIC QUALITY RATING FORM
MW&E 345kV Intertie Project

SQRU Number

Scenic Quality Class/Total

Photograph Location Key

Scenic Quality Rating

Landform	H (5)	<u>H/M (4)</u>	M (3)	M/L (2)	L (1)
Vegetation	H (5)	H/M (4)	<u>M (3)</u>	M/L (2)	L (1)
Water	H (5)	H/M (4)	M (3)	<u>M/L (1)</u>	L (0)
Color	H (5)	H/M (4)	M (3)	<u>M/L (2)</u>	L (1)
Adjacent Scenery	H (5)	H/M (4)	<u>M (3)</u>	M/L (1)	L (0)
Scarcity	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Modifications*	H (2)	H/M (1)	M (0)	<u>M/L (-2)</u>	L (-4)

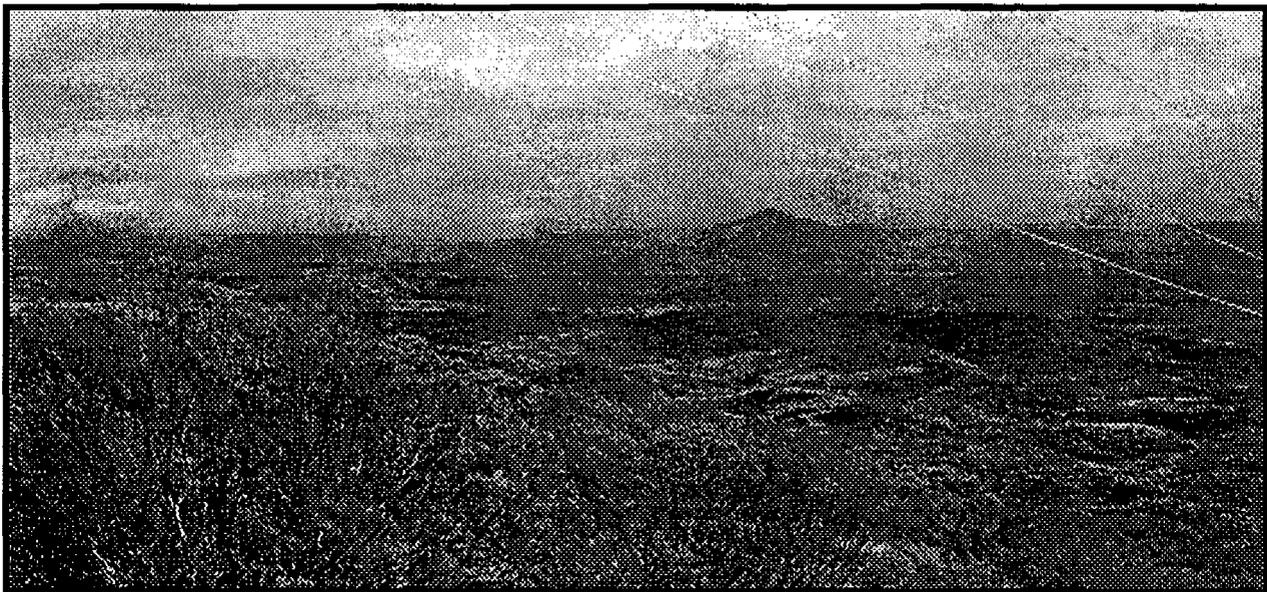
Scenic Quality Classification:
A = 19 or more
B = 12 to 18
C = 11 or less

*Describes cultural modifications to the landscape ranging from discordant intrusions (-4) to favorably increasing the visual variety and promoting visual harmony (2).

Narrative Landscape Description

The terrain is moderately varied with gently sloping drainages offering some visual interest to form and line landscape characteristics. The vegetation is moderately varied with creosote desert grasslands and some riparian deciduous woodland that offer some visual interest. Waterform consists of ephemeral watercourses. Cultural modifications include the existing AEPCO 230kV line and access roads.

Photograph



SCENIC QUALITY RATING FORM
MW&E 345kV Intertie Project

SQRU Number

Scenic Quality Class/Total

Photograph Location Key

Scenic Quality Rating

Landform	H (5)	H/M (4)	<u>M (3)</u>	M/L (2)	L (1)
Vegetation	H (5)	H/M (4)	M (3)	<u>M/L (2)</u>	L (1)
Water	H (5)	H/M (4)	M (3)	M/L (1)	<u>L (0)</u>
Color	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Adjacent Scenery	H (5)	H/M (4)	M (3)	<u>M/L (1)</u>	L (0)
Scarcity	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Modifications*	H (2)	H/M (1)	M (0)	<u>M/L (-2)</u>	L (-4)

Scenic Quality Classification:
A = 19 or more
B = 12 to 18
C = 11 or less

*Describes cultural modifications to the landscape ranging from discordant intrusions (-4) to favorably increasing the visual variety and promoting visual harmony (2).

Narrative Landscape Description

Minimum topographic relief is present in the landscape setting. Gently sloping hills to flat desert grassland plains dominate views and provide little variances to form and line characteristics. Color and texture characteristics, provided by the desert grasslands vegetative pattern are also limited. Waterform is void in the setting. Cultural modifications include the existing AEPCO 230kV line as well as access roads.

Photograph



SCENIC QUALITY RATING FORM
MW&E 345kV Intertie Project

SQRU Number

Scenic Quality Class/Total

Photograph Location Key

Scenic Quality Rating

Landform	H (5)	H/M (4)	<u>M (3)</u>	M/L (2)	L (1)
Vegetation	H (5)	H/M (4)	M (3)	<u>M/L (2)</u>	L (1)
Water	H (5)	H/M (4)	M (3)	<u>M/L (1)</u>	L (0)
Color	H (5)	H/M (4)	M (3)	<u>M/L (2)</u>	L (1)
Adjacent Scenery	H (5)	H/M (4)	M (3)	<u>M/L (1)</u>	L (0)
Scarcity	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Modifications*	H (2)	H/M (1)	M (0)	<u>M/L (-2)</u>	L (-4)

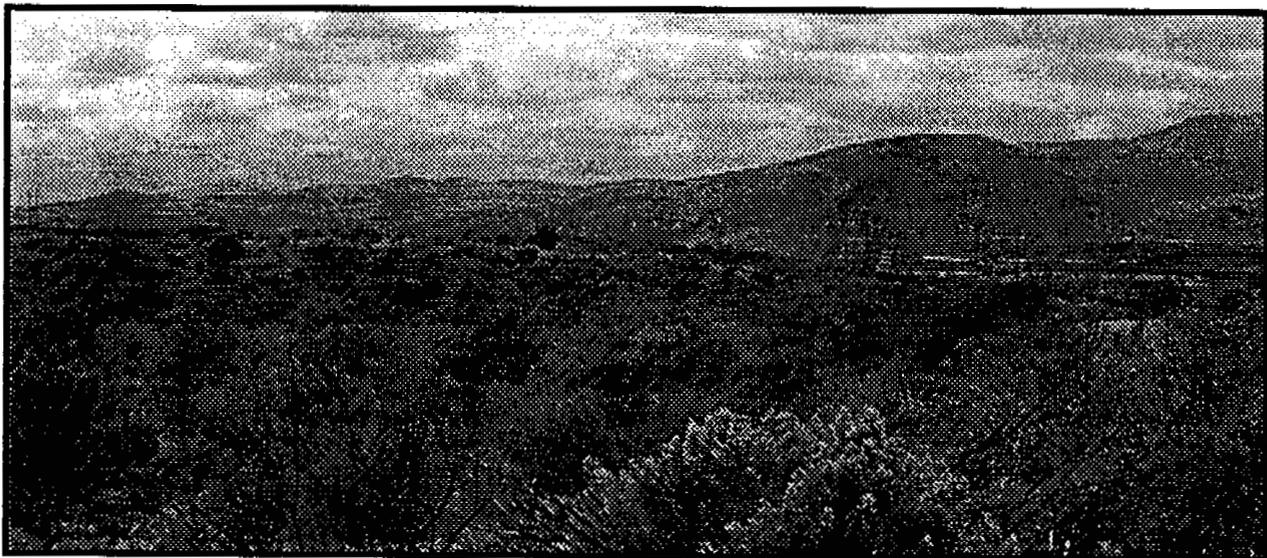
**Scenic Quality
 Classification:**
A = 19 or more
B = 12 to 18
C = 11 or less

*Describes cultural modifications to the landscape ranging from discordant intrusions (-4) to favorably increasing the visual variety and promoting visual harmony (2).

Narrative Landscape Description

Background views of the Black Hills add some interest to form and line in the natural setting. Unvaried topography in foreground and middle ground views lack relative visual interest in comparison to other landforms in the study area. Similar desert grassland vegetation offers limited variation in texture and color. Waterform is essential void. Cultural modifications include the existing AEPCO 230kV line, Guthrie Substation, and access roads (right of photograph).

Photograph



SCENIC QUALITY RATING FORM
MW&E 345kV Intertie Project

SQRU Number

Scenic Quality Class/Total

Photograph Location Key

Scenic Quality Rating

Landform	H (5)	H/M (4)	<u>M (3)</u>	M/L (2)	L (1)
Vegetation	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Water	H (5)	H/M (4)	M (3)	M/L (1)	<u>L (0)</u>
Color	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Adjacent Scenery	H (5)	H/M (4)	<u>M (3)</u>	M/L (1)	L (0)
Scarcity	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Modifications*	H (2)	H/M (1)	<u>M (0)</u>	M/L (-2)	L (-4)

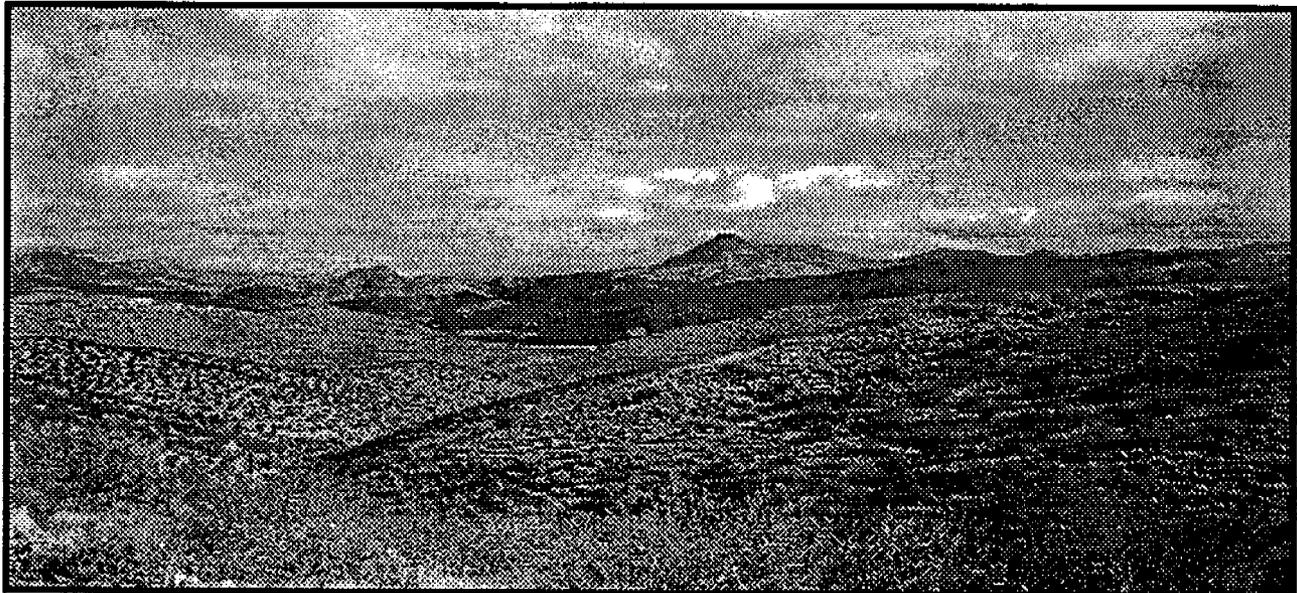
Scenic Quality Classification:
A = 19 or more
B = 12 to 18
C = 11 or less

*Describes cultural modifications to the landscape ranging from discordant intrusions (-4) to favorably increasing the visual variety and promoting visual harmony (2).

Narrative Landscape Description

Topographic relief across the setting is minimal and offers little variances to form characteristics. Gently sloping ridge lines in middle ground views add some interest to the setting. Distant views of the Big Lue Mountains and Sunset Peak add distinctive characteristics to the setting. The vegetation is unvaried with extensive areas of creosotebush-tarbrush or creosotebush-bursage. Intermittent pockets of ocotillos occur on sunny south-facing slopes. Cultural modifications include the rural communities of Clifton and Morenci as well as the AEP/CO 230kV line (not shown in photograph).

Photograph



SCENIC QUALITY RATING FORM
MW&E 345kV Intertie Project

SQRU Number

Scenic Quality Class/Total

Photograph Location Key

Scenic Quality Rating

Landform	H (5)	<u>H/M (4)</u>	M (3)	M/L (2)	L (1)
Vegetation	H (5)	H/M (4)	<u>M (3)</u>	M/L (2)	L (1)
Water	H (5)	H/M (4)	M (3)	<u>M/L (1)</u>	L (0)
Color	H (5)	H/M (4)	M (3)	<u>M/L (2)</u>	L (1)
Adjacent Scenery	H (5)	<u>H/M (4)</u>	M (3)	M/L (1)	L (0)
Scarcity	H (5)	H/M (4)	M (3)	<u>M/L (2)</u>	L (1)
Modifications*	H (2)	H/M (1)	M (0)	<u>M/L (-2)</u>	L (-4)

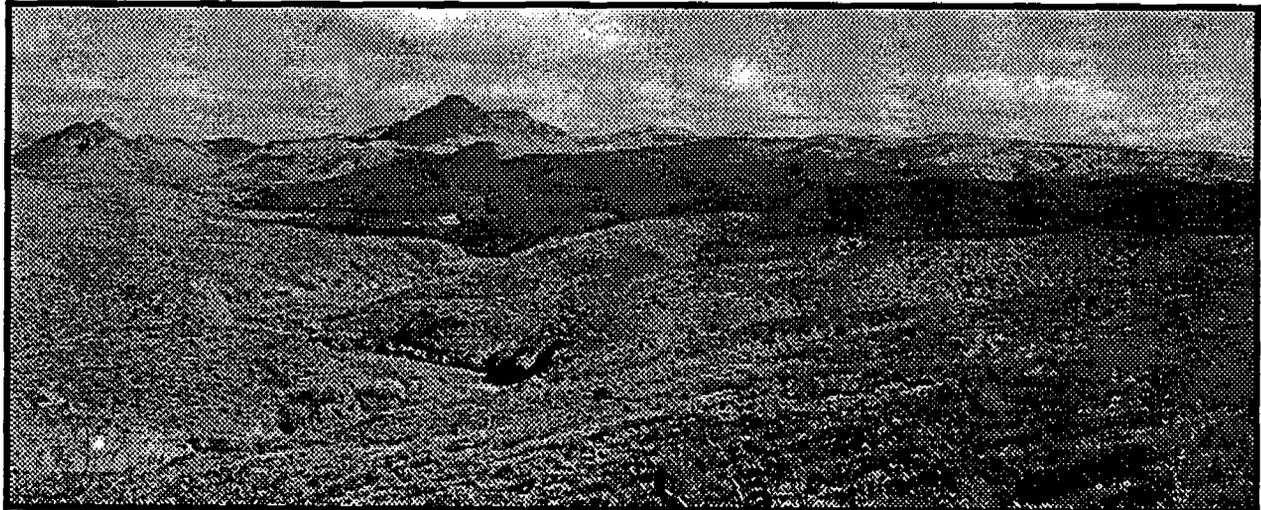
Scenic Quality Classification:
A = 19 or more
B = 12 to 18
C = 11 or less

*Describes cultural modifications to the landscape ranging from discordant intrusions (-4) to favorably increasing the visual variety and promoting visual harmony (2).

Narrative Landscape Description

Topographic relief within the landscape setting (adjacent to the San Francisco River) is moderately varied with riparian stringers adding some distinctive character to form and line elements. The vegetative pattern of desert scrub grassland offers limited interesting qualities to color and texture aside from its relationship to deciduous riparian vegetation along the San Francisco River. Waterform is limited to ephemeral stringers which have intermittent water present throughout the year. Cultural modifications include an old railroad grade with associated bridge abutments (lower left of photograph), the rural community of Clifton, Arizona, SR 191 (background) as well as the existing AEPCO 230kV line (not shown in photograph).

Photograph



SCENIC QUALITY RATING FORM
MW&E 345kV Intertie Project

SQRU Number

Scenic Quality Class/Total

Photograph Location Key

Scenic Quality Rating

Landform	<u>H(5)</u>	H/M (4)	M (3)	M/L (2)	L (1)
Vegetation	<u>H(5)</u>	H/M (4)	M (3)	M/L (2)	L (1)
Water	<u>H(5)</u>	H/M (4)	M (3)	M/L (1)	L (0)
Color	<u>H(5)</u>	H/M (4)	M (3)	M/L (2)	L (1)
Adjacent Scenery	H (5)	<u>H/M (4)</u>	M (3)	M/L (1)	L (0)
Scarcity	H (5)	<u>H/M (4)</u>	M (3)	M/L (2)	L (1)
Modifications*	H (2)	H/M (1)	M (0)	<u>M/L (-2)</u>	L (-4)

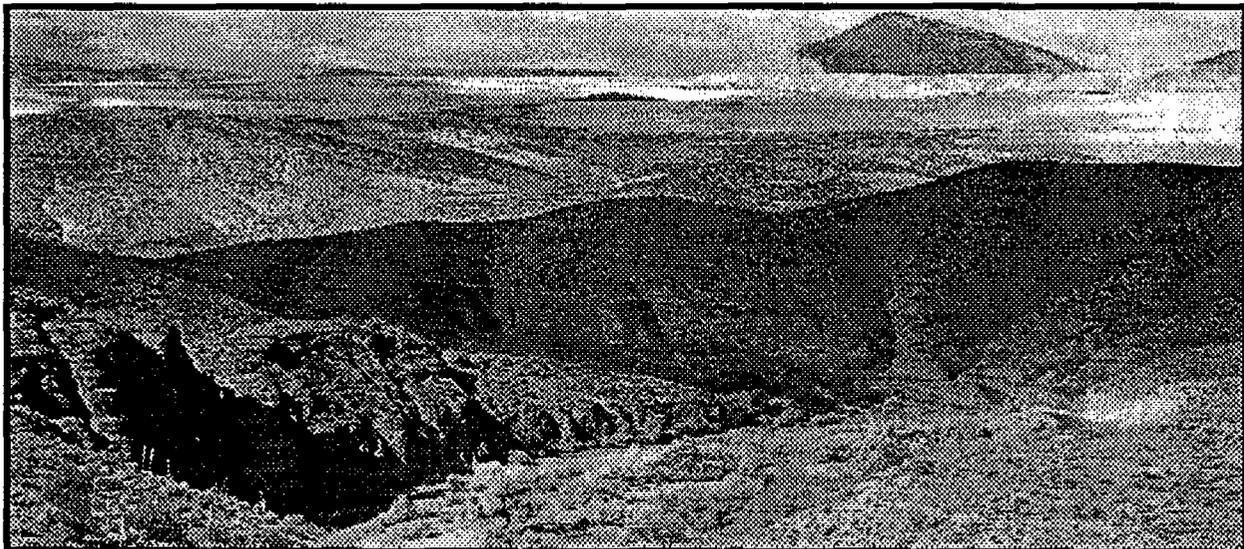
Scenic Quality Classification:
A = 19 or more
B = 12 to 18
C = 11 or less

*Describes cultural modifications to the landscape ranging from discordant intrusions (-4) to favorably increasing the visual variety and promoting visual harmony (2).

Narrative Landscape Description

The terrain is highly varied along this portion of the San Francisco River. Near-vertical walls of upto 100 feet along the southern edge of the river offer distinctive qualities to landform. The meandering path of the river offers additional qualities to landform. The vegetation within the riparian corridor is dominated by salt cedar with intermittent pockets of native willows and cottonwoods. The seasonal changes in color offer additional interest to the setting. The perennial watercourse further adds to the scenic value of the landscape. Cultural modifications include the existing AEPCO 230kV line (conductors can be seen in the middle of the photograph) which appear subordinate to the natural setting.

Photograph



SCENIC QUALITY RATING FORM
MW&E 345kV Intertie Project

SQRU Number

Scenic Quality Class/Total

Photograph Location Key

Scenic Quality Rating

Landform	H (5)	H/M (4)	<u>M (3)</u>	M/L (2)	L (1)
Vegetation	H (5)	H/M (4)	<u>M (3)</u>	M/L (2)	L (1)
Water	H (5)	H/M (4)	M (3)	<u>M/L (1)</u>	L (0)
Color	H (5)	<u>H/M (4)</u>	M (3)	M/L (2)	L (1)
Adjacent Scenery	H (5)	H/M (4)	<u>M (3)</u>	M/L (1)	L (0)
Scarcity	H (5)	H/M (4)	M (3)	<u>M/L (2)</u>	L (1)
Modifications*	H (2)	H/M (1)	<u>M (0)</u>	M/L (-2)	L (-4)

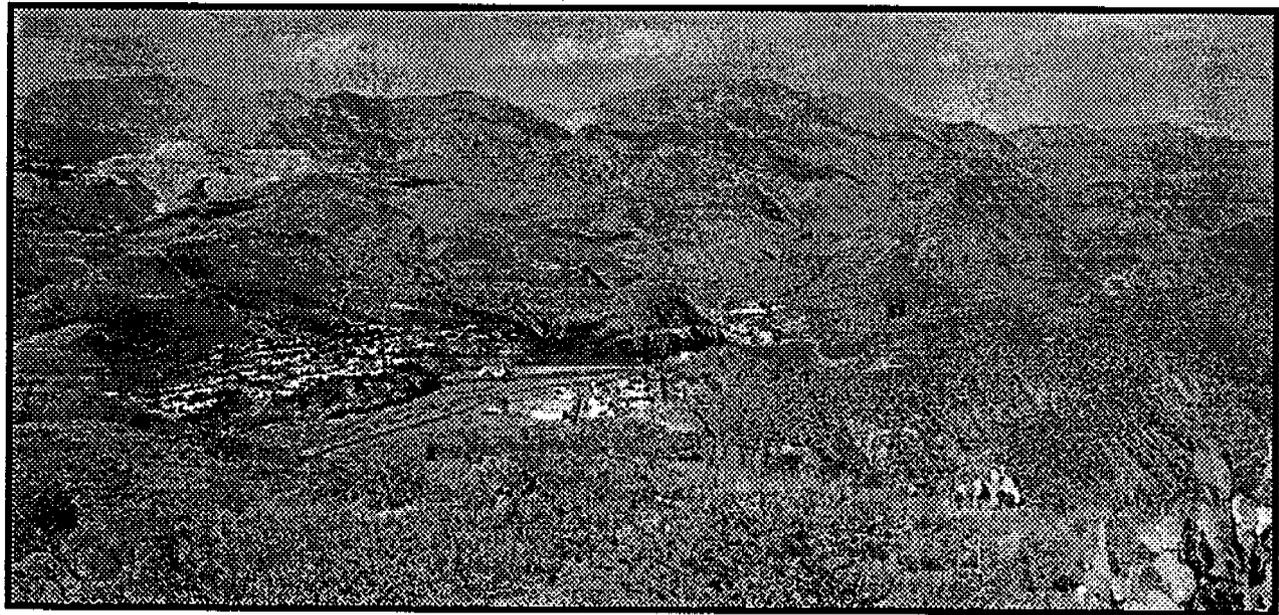
**Scenic Quality
 Classification:**
 A = 19 or more
 B = 12 to 18
 C = 11 or less

*Describes cultural modifications to the landscape ranging from discordant intrusions (-4) to favorably increasing the visual variety and promoting visual harmony (2).

Narrative Landscape Description

The terrain is moderately varied with rounded hills that are not visually dominant but are surrounded by similar landforms. The San Francisco fault line (to the right of the photograph) adds color contrast to the surrounding landforms. The vegetation is moderately varied with a desert scrub grassland type. Waterforms consist of intermittent or interrupted riparian stringers. Cultural modifications include a natural gas pipeline corridor (bottom left of photograph), the rural community of Clifton, Arizona, and Morenci mine tailings in the distance.

Photograph



SCENIC QUALITY RATING FORM
MW&E 345kV Intertie Project

SQRU Number

Scenic Quality Class/Total

Photograph Location Key

Scenic Quality Rating

Landform	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Vegetation	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Water	H (5)	H/M (4)	M (3)	M/L (1)	<u>L (0)</u>
Color	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Adjacent Scenery	H (5)	H/M (4)	M (3)	<u>M/L (1)</u>	L (0)
Scarcity	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Modifications*	H (2)	H/M (1)	M (0)	M/L (-2)	<u>L (-4)</u>

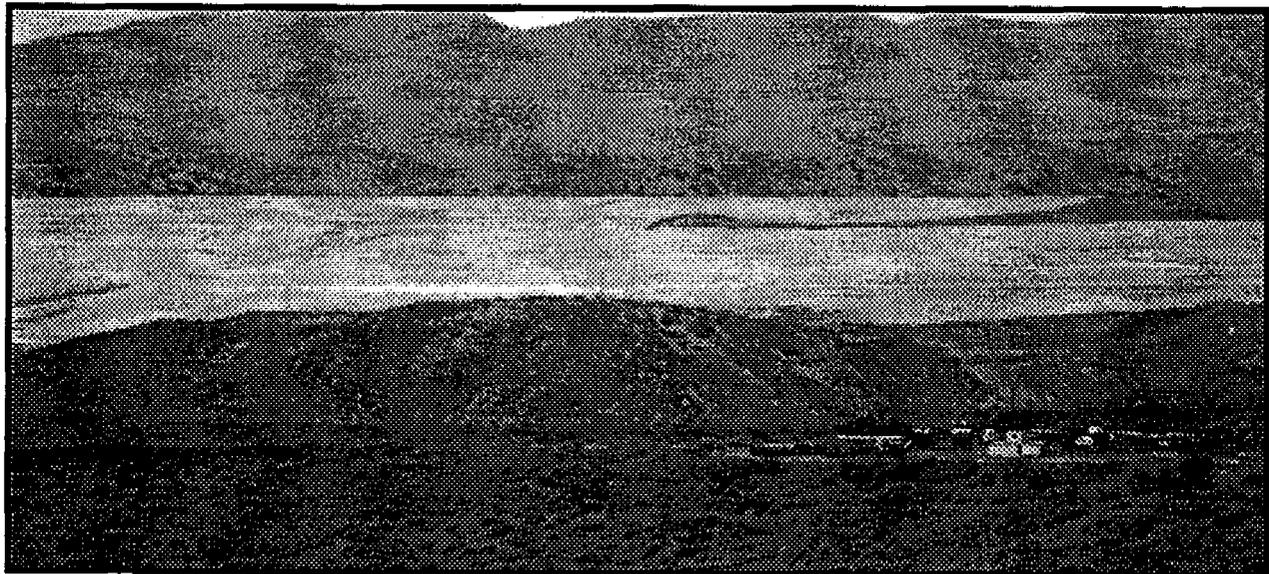
Scenic Quality Classification:
A = 19 or more
B = 12 to 18
C = 11 or less

*Describes cultural modifications to the landscape ranging from discordant intrusions (-4) to favorably increasing the visual variety and promoting visual harmony (2).

Narrative Landscape Description

Topographic relief is minimal within the landscape setting and provides minimal natural form and line characteristics. Gently sloping hills adjacent to and within the sulfur ponds add some interesting qualities. Vegetative variances are essentially void within the sulfur pond. Waterform is also void within the landscape. Cultural modifications include horse corrals, access roads, and mine sulfur ponds.

Photograph



SCENIC QUALITY RATING FORM
MW&E 345kV Intertie Project

SQRU Number

Scenic Quality Class/Total

Photograph Location Key

Scenic Quality Rating

Landform	H (5)	<u>H/M (4)</u>	M (3)	M/L (2)	L (1)
Vegetation	H (5)	H/M (4)	<u>M (3)</u>	M/L (2)	L (1)
Water	H (5)	H/M (4)	<u>M (3)</u>	M/L (1)	L (0)
Color	H (5)	H/M (4)	M (3)	<u>M/L (2)</u>	L (1)
Adjacent Scenery	H (5)	<u>H/M (4)</u>	M (3)	M/L (1)	L (0)
Scarcity	H (5)	H/M (4)	<u>M (3)</u>	M/L (2)	L (1)
Modifications*	H (2)	H/M (1)	M (0)	<u>M/L (-2)</u>	L (-4)

Scenic Quality Classification:
A = 19 or more
B = 12 to 18
C = 11 or less

*Describes cultural modifications to the landscape ranging from discordant intrusions (-4) to favorably increasing the visual variety and promoting visual harmony (2).

Narrative Landscape Description

The terrain is moderately varied with canyons and drainages that add to form and line characteristic of the setting. The vegetation is moderately varied with creosote desert grasslands adjacent to riparian deciduous woodland species, which adds some distinctive qualities to color and texture characteristics of the landscape. Waterform consists of ephemeral and interrupted watercourses. Cultural modifications include SR191 (background view).

Photograph



SCENIC QUALITY RATING FORM
MW&E 345kV Intertie Project

SQRU Number

Scenic Quality Class/Total

Photograph Location Key

Scenic Quality Rating

Landform	H (5)	H/M (4)	<u>M (3)</u>	M/L (2)	L (1)
Vegetation	H (5)	H/M (4)	M (3)	<u>M/L (2)</u>	L (1)
Water	H (5)	H/M (4)	M (3)	M/L (1)	<u>L (0)</u>
Color	H (5)	H/M (4)	M (3)	<u>M/L (2)</u>	L (1)
Adjacent Scenery	H (5)	H/M (4)	M (3)	<u>M/L (1)</u>	L (0)
Scarcity	H (5)	H/M (4)	M (3)	M/L (2)	<u>L (1)</u>
Modifications*	H (2)	H/M (1)	<u>M (0)</u>	M/L (-2)	L (-4)

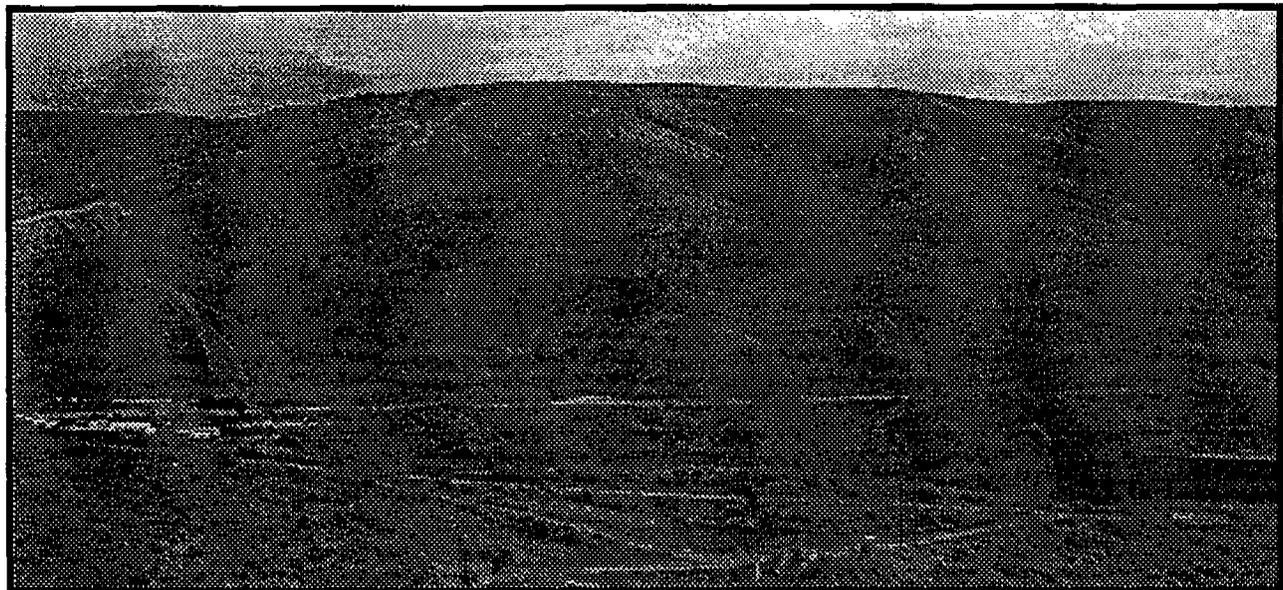
Scenic Quality Classification:
A = 19 or more
B = 12 to 18
C = 11 or less

*Describes cultural modifications to the landscape ranging from discordant intrusions (-4) to favorably increasing the visual variety and promoting visual harmony (2).

Narrative Landscape Description

The terrain is characterized by gently sloping hills that provide little illusion of spatial definition or landforms with which to orient. The terrain is lacking visual interest in comparison to the other landforms in the project area. This vegetation type offers little variation in texture or color. Waterforms are essentially lacking in this scenic quality unit. Cultural modifications include SR 191, mine slag heaps (lower right of photograph), buildings, and access roads.

Photograph



Scenic Quality

Morenci Water & Electric
345KV Intertie Project

Legend

BLM, VRM Class

- II
- III

Scenic Quality Class

- Class A
- Class B
- Class C

General Reference Features

- Power Substation
- Proposed Substation - Final Approval
- 345KV Transmission Line
- 230KV Transmission Line
- Pipeline
- Community Boundaries
- Primary Transportation Routes
- Secondary Transportation Routes
- Railroads

Other Symbols:

- Photo Identifier
- Photo Direction
- Alternative Routes
- Link Identifier for Routes
- Link Node
- SQRU BOUNDARY

Scale in Miles

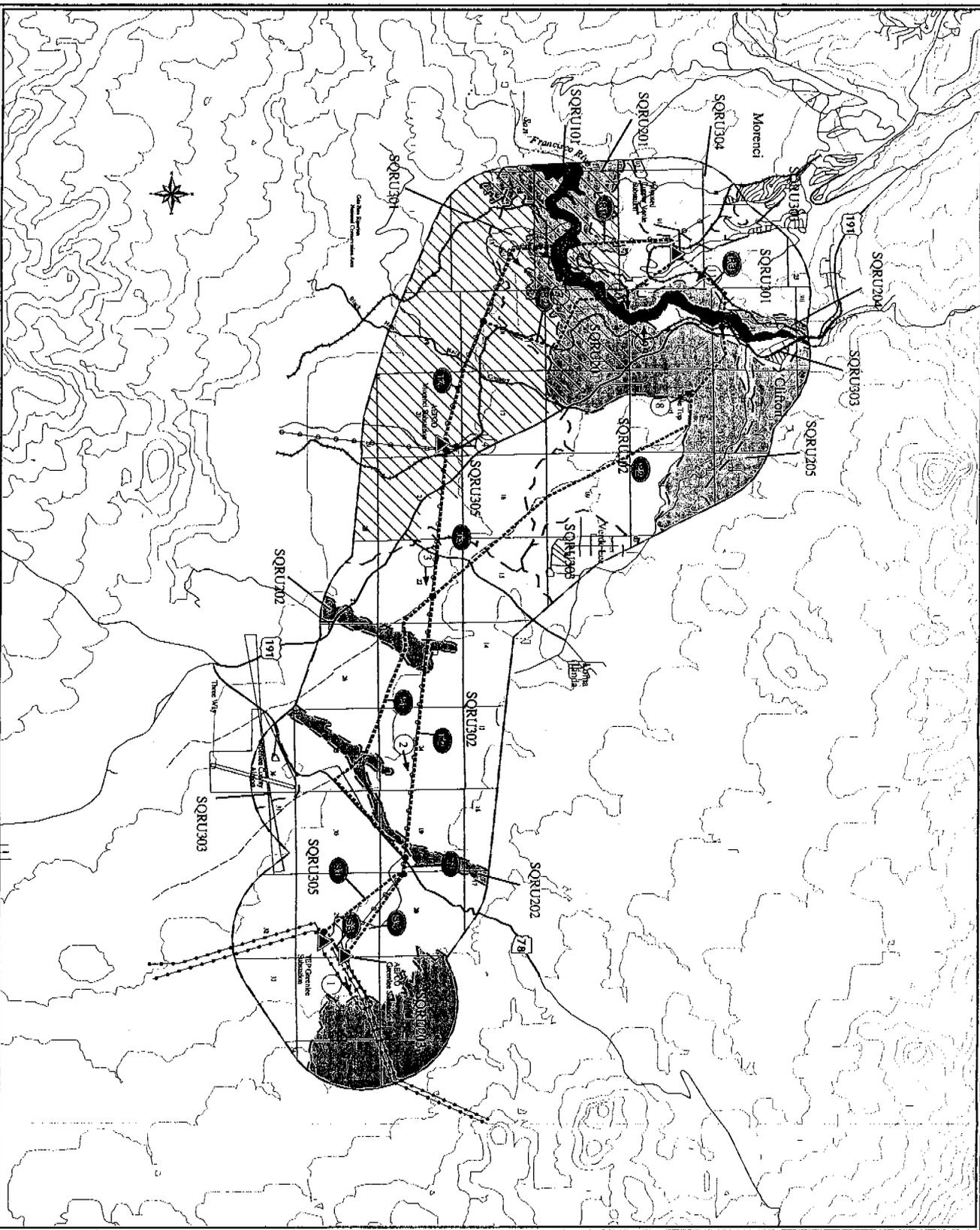
0 1 2

Interpret Water & Electric Co.

DAMES & MOORE

July 18, 1999

Figure C-1



APPENDIX D
CULTURAL RESOURCES

**APPENDIX D-1
CULTURAL RESOURCES**

TABLE D-1 CULTURAL RESOURCES RECORDED WITHIN 1/4 MILE OF THE PROPOSED AND ALTERNATIVE ROUTES				
	Site Number	Link(s)	Description	Size
1	AZ CC:3:3 (ASM)	T3	lithic scatter	528 acres
2	AZ CC:3:4 (ASM)	T3	lithic scatter with rock features	4,500 acres
3	AZ CC:3:5 (ASM)	T3	lithic scatter	2,128 acres
4	AZ CC:3:6 (ASM)	T3	lithic scatter	280 acres
5	AZ CC:3:7 (ASM)	T3	Euroamerican artifact scatter	23,100 acres
6	AZ CC:3:8 (ASM)	T4	lithic scatter	1,625 acres
7	AZ CC:3:9 (ASM)	T4	prehistoric/historic artifact scatter	392 acres
8	AZ CC:3:10 (ASM)	T4	lithic scatter	360 acres
9	AZ CC:3:11 (ASM)	T4	lithic scatter	1,176 acres
10	AZ CC:3:12 (ASM)	T3	lithic scatter	1914 acres
11	AZ CC:3:13 (ASM)	T3	lithic scatter	45.5 acres
12	AZ CC:3:14 (ASM)	T3	lithic scatter	9 acres
13	AZ CC:3:33 (ASM)	T4	lithic scatter	3.7 acres
14	AZ CC:3:91 (ASM)	T3	Historic US 666	not applicable
15	AZ CC:3:92 (ASM)	R2	Historic highway - Old Safford-Clifton Road	not applicable
16	AZ CC:4:4 (ASM)	S2	lithic scatter	unknown
17	AZ CC:4:5 (ASM)	S4	lithic scatter with rock features	2,720 acres
18	AZ CC:4:6 (ASM)	P1 & T1	CCC water and soil conservation features	<1 acre
19	AZ CC:4:7 (ASM)	T2	lithic scatter	2,170 acres
20	AZ CC:4:8 (ASM)	T2	lithic scatter	3,250 acres
21	AZ CC:4:9 (ASM)	T2	lithic scatter	6,790 acres
22	AZ CC:4:10 (ASM)	T3	lithic scatter	850 acres
23	AZ CC:4:11 (ASM)	T3	lithic scatter	1,080 acres
24	AZ CC:4:21 (ASM)	P1	agricultural fields	37 acres
25	AZ CC:4:36 (ASM)	P1, S1, S4 & T1	CCC water and soil conservation features	33 acres
26	AZ CC:4:37 (ASM)	S1, S2 & S3	CCC water and soil conservation features	31 acres
27	AZ CC:4:40 (ASM)	T2	CCC check dam	<1 acre
28	AZ CC:4:41 (ASM)	T2	CCC check dam	<1 acre
29	AZ CC:4:42 (ASM)	T2	CCC check dam	<1 acre
30	AZ W:15:15 (ASM)	R1	lithic scatter with rock piles/historic trash scatter	0.6 acre
31	AZ W:15:16 (ASM)	R1	lithic scatter	0.4 acre
32	AZ W:15:17 (ASM)	R1	historic lithic scatter with rock piles	1.2 acres
33	AZ W:15:39 (ASM)	R1	Historic mine	unknown
34	AZ W:15:53 (ASM)	R1	rock pile	121 acres
35	AZ W:15:54 (ASM) AZ CC:3:57 (BLM)	R1	Abandoned historic Morenci Southern Railroad grade	not applicable
36	AR-04-934 (BLM)	P2	Mogollon lithic scatter with rock piles	0.5 acre
37	AR-04-935 (BLM)	P2	lithic scatter with rock features	450 acres
38	AZ & NM RR AZ C:4:25 (ASM)	R2, T3	In-use Historic Railroad	not applicable

**TABLE D-1
CULTURAL RESOURCES RECORDED WITHIN 1/4 MILE
OF THE PROPOSED AND ALTERNATIVE ROUTES**

	Site Number	Link(s)	Description	Size
39	Solomonville Overpass Bridge # 8150	T4	Historic Bridge	not applicable

APPENDIX E
BIOLOGICAL RESOURCES



GAME & FISH DEPARTMENT

2221 West Greenway Road, Phoenix, Arizona 85023-4399 (602) 942-3000
www.gf.state.az.us

Governor

Jane Dee Hull

Commissioners:

Chairman, Herb Guenther, Tucson

Michael M. Golightly, Flagstaff

William Berlat, Tucson

M. Jean Hassell, Scottsdale

Dennis D. Manning, Alpine

Director

Duane L. Shroufe

Deputy Director

Thomas W. Spalding

February 10, 1999

Ms. Kimberley A. Otero
 Project Biologist
 Dames and Moore
 Cambic Corporate Center
 1790 East River Road, Suite E-300
 Tucson, Arizona 85718-5876

Re: Special Status Species: Environmental Assessment and
 Certificate of Environmental Compatibility Application for
 Proposed Greenlee to Morenci Transmission Line

Dear Ms. Otero:

The Arizona Game and Fish Department (Department) has reviewed your letter, dated December 14, 1998, regarding special status species in the above-referenced area, and the following information is provided.

The Department's Heritage Data Management System has been accessed and current records show that the special status species listed below have been documented as occurring in the project vicinity.

<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>	<u>STATUS</u>
common black-hawk	<i>Buteogallus anthracinus</i>	WC, S
San Carlos wild- buckwheat	<i>Eriogonum capillare</i>	S, SR

STATUS DEFINITIONS

WC - Wildlife of Special Concern in Arizona. Species whose occurrence in Arizona is or may be in jeopardy, or with known or perceived threats or population declines, as described by the Department's listing of Wildlife of Special Concern in Arizona (WSCA, in prep.). Species included in WSCA are currently the same as those in Threatened Native Wildlife in Arizona (1988).

S - Sensitive. Species classified as "sensitive" by the Regional Forester when occurring on lands managed by the U.S.D.A. Forest Service.

Ms. Kimberly Otero
February 10, 1999
2

SR - Salvage Restricted. Those Arizona native plants not included in the Highly Safeguarded Category, but that have a high potential for theft or vandalism, as described by the Arizona Native Plant Law (1993).

At this time, the Department's comments are limited to the special status species information provided above. This correspondence does not represent the Department's evaluation of impacts to wildlife or wildlife habitat associated with activities occurring in the subject area. Please contact me at (602) 789-3605, if you have any questions regarding this letter.

Sincerely,



Bob Broscheid
Project Evaluation Specialist
Habitat Branch

BDB:bb

cc: Joan Scott, Habitat Program Manager, Region V, Tucson

AGFD# 1-15-99(02)



Arizona Department of Agriculture

1688 West Adams, Phoenix, Arizona 85007
(602) 542-4373 FAX (602) 542-0999

PLANT SERVICES DIVISION

January 27, 1999

Kimberly A. Otero
Project Biologist
Dames & Moore
Cambic Corporate Center
1790 E. River Rd., Ste. E-300
Tucson, AZ 85718-5876

RE: D & M Job Number 00136-113-050

Dear Ms. Otero:

The Arizona Department of Agriculture has reviewed the referenced information and maps dated December 14, 1998.

The Department recommends that, if any protected native plants exist on site, they be avoided or transplanted preferably on site. If any plants or wood are removed from the site for personal use, State permits must first be obtained.

If it is not known if protected plants occur on the proposed project site, the Department, upon request, will conduct a survey of the site to determine the type and number of protected plants present. The applicant, however, will be billed for the survey. The Department will also accept survey counts from other competent sources.

We appreciate the opportunity to review the proposed actions. If you need additional information, please contact me at 602/542-3292.

Sincerely,

A handwritten signature in cursive script, reading "James McGinnis".

James McGinnis
Chief Enforcement Officer
Native Plants/Antiquities

JM:clw



United States Department of the Interior

Fish and Wildlife Service

Arizona Ecological Services Field Office

2321 W. Royal Palm Road, Suite 103

Phoenix, Arizona 85021-4951

(602) 640-2720 Fax (602) 640-2730



In Reply Refer To:

AESO/SE

2-21-99-I-100

[CCN 990165]

January 20, 1999

Ms. Kimberly A. Otero
Dames & Moore
1790 East River Road, Suite E-300
Tucson, Arizona 85718-5876

RE: EA for Proposed Greenlee to Morenci 345kV Transmission Line (Job No. 00136-113-050)

Dear Ms. Otero:

This letter responds to your December 14, 1998, request for an inventory of threatened or endangered species, or those that are proposed to be listed as such under the Endangered Species Act of 1973, as amended (Act), which may potentially occur in your project area (Greenlee County). The enclosed list may include candidate species as well. We hope the enclosed county list of species will be helpful. In future communications regarding this project, please refer to consultation number 2-21-99-I-100.

Please be aware that you may also access limited county species lists for Arizona on our internet web site at the following:

<http://ifw2es.fws.gov/endspcs/lists/>

The enclosed list of the endangered, threatened, proposed, and candidate species includes all those potentially occurring anywhere in the county, or counties, where your project occurs. Please note that your project area may not necessarily include all or any of these species. The information provided includes general descriptions, habitat requirements, and other information for each species on the list. Also on the enclosed list is the Code of Federal Regulations (CFR) citation for each listed or proposed species. Additional information can be found in the CFR and is available at most public libraries. This information should assist you in determining which species may or may not occur within your project area. Site-specific surveys could also be helpful and may be needed to verify the presence or absence of a species or its habitat as required for the evaluation of proposed project-related impacts.

Endangered and threatened species are protected by Federal law and must be considered prior to project development. If the action agency determines that listed species or critical habitat may be adversely affected by a federally funded, permitted, or authorized activity, the action agency must request formal consultation with the Service. If the action agency determines that the planned action may jeopardize a proposed species or destroy or adversely modify proposed

critical habitat, the action agency must enter into a section 7 conference with the Service. Candidate species are those which are being considered for addition to the list of threatened or endangered species. Candidate species are those for which there is sufficient information to support a proposal for listing. Although candidate species have no legal protection under the Act, we recommend that they be considered in the planning process in the event that they become listed or proposed for listing prior to project completion.

If any proposed action occurs in or near areas with trees and shrubs growing along watercourses, known as riparian habitat, the Service recommends the protection of these areas. Riparian areas are critical to biological community diversity and provide linear corridors important to migratory species. In addition, if the project will result in the deposition of dredged or fill materials into waterways or excavation in waterways, we recommend you contact the Army Corps of Engineers which regulates these activities under Section 404 of the Clean Water Act.

The State of Arizona protects some plant and animal species not protected by Federal law. We recommend you contact the Arizona Game and Fish Department and the Arizona Department of Agriculture for State-listed or sensitive species in your project area.

The Service appreciates your efforts to identify and avoid impacts to listed and sensitive species in your project area. If we may be of further assistance, please feel free to contact Tom Gatz.

Sincerely,



David L. Harlow
Field Supervisor

Enclosure

cc: Director, Arizona Game and Fish Department, Phoenix, AZ

1/14/99

CONSERVATION AGREEMENT

TOTAL= 1

NAME: GOODDINGS ONION

ALLIUM GOODDINGII

STATUS: NONE

CRITICAL HAB No RECOVERY PLAN: No CFR:

DESCRIPTION: HERBACEOUS PERNIAL PLANT; BROAD, FLAT, RATHER BLUNT LEAVES;
FLOWERING STALK 14-17 INCHES TALL, FLATTENED, AND NARROWLY
WINGED TOWARD APEX; FRUIT IS BROADER THAN LONG; SEEDS ARE
SHORT AND THICK

ELEVATION
RANGE: > 7,500 FT FT.

COUNTIES: APACHE, GREENLEE, PIMA

HABITAT: FORESTED DRAINAGE BOTTOMS AND ON MOIST NORTH FACING SLOPES OF MIXED CONIFER AND
SPRUCE FIR FORESTS

CONSERVATION AGREEMENT BETWEEN THE SERVICE AND THE FOREST SERVICE FINALIZED IN 1997. IN NEW
MEXICO ON THE LINCOLN AND GILA NATIONAL FORESTS

SPECIAL STATUS SPECIES CODES

SPECIAL STATUS SPECIES CODES

The USFWS has codes for defining the extent of rarity and level of threat to biotic taxa. Special status species identified as occurring, or potentially occurring, in the area and their categorical ratings are presented in Table 4, Chapter 4. The USFWS species code definitions are:

E = Endangered: Any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary to constitute a pest whose protection under the Endangered Species Act would present an overwhelming and overriding risk to man.

T = Threatened: Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

C = Category 1: Status review taxa for which the USFWS currently has on file substantial information on biological vulnerability and threat(s) to support the appropriateness of proposing to list the taxa as an endangered or threatened species.

The BLM classifies species as Sensitive, as defined below:

BLMS = Bureau of Land Management Sensitive: These species may be so designated at the discretion of the state director for any of several reasons. They may be under status review by the USFWS, have typically small and widely dispersed populations, have numbers declining so rapidly that Federal listing may become necessary, or inhabit specialized or unique habitats or other ecological refugia. They receive the same protection as a Federal candidate species.

The State of Arizona follows the Federal classification system for plants and sets forth the following plant protection guidelines under the Arizona Native Plant Law:

Protection is afforded native plants through the Arizona Native Plant Law (ANPL). The ANPL, administered by the State Department of Agriculture, was established to protect the unique vegetation of the Sonoran Desert. Some of the species protected by the ANPL, which occur along the proposed alignments, are paloverde and most cactus. Permits must be obtained from the Department of Agriculture before any native plants are removed, transplanted, or destroyed. A Notice of Intent to Clear Land must be filed with the Department 30 days prior to any action clearing any area of one to less than forty acres and 60 days for areas of 40 acres or more.

SPECIAL STATUS SPECIES TABLE

1/14/99

1) LISTED

TOTAL= 9

NAME: MEXICAN GRAY WOLF

CANIS LUPUS BAILEYI

STATUS: ENDANGERED

CRITICAL HAB No RECOVERY PLAN: Yes CFR: 32 FR 4001, 03-11-67; 43

DESCRIPTION: LARGE DOG-LIKE CARNIVORE WITH VARYING COLOR, BUT USUALLY A
SHADE OF GRAY. DISTINCT WHITE LIP LINE AROUND MOUTH. WEIGH 60-
90 POUNDS.

FR 1912, 03-09-78

ELEVATION

RANGE: 4,000-12,000 FT.

COUNTIES: APACHE, COCHISE, GREENLEE, PIMA, SANTA CRUZ

HABITAT: CHAPPARAL, WOODLAND, AND FORESTED AREAS. MAY CROSS DESERT AREAS.

HISTORIC RANGE IS CONSIDERED TO BE LARGER THAN THE COUNTIES LISTED ABOVE. UNCONFIRMED REPORTS OF INDIVIDUALS IN THE SOUTHERN PART OF THE STATE (COCHISE, PIMA, SANTA CRUZ) CONTINUE TO BE RECEIVED. INDIVIDUALS MAY STILL PERSIST IN MEXICO. EXPERIMENTAL NONESSENTIAL POPULATION INTRODUCED IN THE BLUE PRIMITIVE AREA OF GREENLEE AND APACHE COUNTIES.

NAME: APACHE (ARIZONA) TROUT

ONCORHYNCHUS APACHE

STATUS: THREATENED

CRITICAL HAB No RECOVERY PLAN: Yes CFR: 40 FR 29864, 07-19-1975

DESCRIPTION: THIS YELLOWISH OR YELLOW-OLIVE CUTTHROAT-LIKE TROUT HAS
LARGE DARK SPOTS ON BODY. ITS DORSAL, ANAL, AND CAUDAL FINS
EDGED WITH WHITE. IT HAS NO RED LATERAL BAND.

ELEVATION

RANGE: >5000 FT.

COUNTIES: APACHE, GREENLEE, GILA, GRAHAM, NAVAJO

HABITAT: PRESENTLY RESTRICTED TO COLD MOUNTAIN STREAMS WITH MANY LOW GRADIENT MEADOW REACHES

OCCUPIES STREAM HABITATS WITH SUBSTRATES OF BOULDERS, ROCKS, AND GRAVEL WITH SOME SAND OR SILT THROUGH MIXED CONIFER AND SPRUCE-FIR FORESTS, AND MONTANE MEADOWS AND GRASSLANDS IN THE WHITE MOUNTAINS. ALSO MANAGED AS A SPORT FISH UNDER SPECIAL REGULATIONS.

NAME: LOACH MINNOW

TIAROGA COBITIS

STATUS: THREATENED

CRITICAL HAB No RECOVERY PLAN: Yes CFR: 51 FR 39468, 10-28-1986;

DESCRIPTION: SMALL (<3 INCHES LONG) SLENDER, ELONGATED FISH. OLIVE COLORED
WITH DIRTY WHITE SPOTS AT THE BASE OF THE DORSAL AND CAUDAL
FINS. BREEDING MALES VIVID RED ON MOUTH AND BASE OF FINS

59 FR 10898, 03-08-1994

ELEVATION

RANGE: <7000 FT.

COUNTIES: PINAL, GRAHAM, GREENLEE, GILA, APACHE, NAVAJO, (AZ); GRANT, CATRON, (NM)

HABITAT: BENTHIC SPECIES OF SMALL TO LARGE PERENNIAL STREAMS WITH SWIFT SHALLOW WATER OVER
COBBLE & GRAVEL

PRESENTLY FOUND IN ARAVAIPA CREEK, BLUE RIVER, CAMPBELL BLUE CREEK, SAN FRANCISCO RIVER, DRY BLUE CREEK, TULAROSA RIVER, EAST-WEST-AND MIDDLE FORKS OF THE GILA RIVER, AND THE MAINSTEM UPPER GILA RIVER. CRITICAL HABITAT WAS REMOVED IN MARCH 1998.

1/14/99

NAME: RAZORBACK SUCKER

XYRAUCHEN TEXANUS

STATUS: ENDANGERED

CRITICAL HAB Yes RECOVERY PLAN: Yes CFR: 55 FR 21154, 05-22-1990;

DESCRIPTION: LARGE (UP TO 3 FEET AND UP TO 16 POUNDS) LONG, HIGH SHARP-
EDGED KEEL-LIKE HUMP BEHIND THE HEAD. HEAD FLATTENED ON TOP.
OLIVE-BROWN ABOVE TO YELLOWISH BELOW.

59 FR 13374, 03-21-1994

ELEVATION

RANGE: <6000 FT.

COUNTIES: GREENLEE, MOHAVE, PINAL, YAVAPAI, YUMA, LA PAZ, MARICOPA (REFUGIA), GILA, COCONINO, GRAHAM

HABITAT: RIVERINE & LACUSTRINE AREAS, GENERALLY NOT IN FAST MOVING WATER AND MAY USE BACKWATERS

SPECIES IS ALSO FOUND IN HORSESHOE RESERVOIR (MARICOPA COUNTY). CRITICAL HABITAT INCLUDES THE 100-YEAR FLOODPLAIN OF THE RIVER THROUGH GRAND CANYON FROM CONFLUENCE WITH PARIÁ RIVER TO HOOVER DAM; HOOVER DAM TO DAVIS DAM; PARKER DAM TO IMPERIAL DAM. ALSO GILA RIVER FROM AZ/NM BORDER TO COOLIDGE DAM; AND SALT RIVER FROM HWY 60/SR 77 BRIDGE TO ROOSEVELT DAM; VERDE RIVER FROM FS BOUNDARY TO HORSESHOE LAKE.

NAME: SPIKEDACE

MEDA FULGIDA

STATUS: THREATENED

CRITICAL HAB No RECOVERY PLAN: Yes CFR: 51 FR 23769, 07-01-1986;

DESCRIPTION: SMALL (<3 INCHES) SLIM WITH SLIVERY SIDES & 'SPINE' ON DORSAL
FIN. BREEDING MALES BRASSY GOLDEN COLOR

59 FR 10906, 03-08-1994

ELEVATION

RANGE: <6000 FT.

COUNTIES: GRAHAM, PINAL, GREENLEE, YAVAPAI, (AZ); GRANT, (NM)

HABITAT: MODERATE TO LARGE PERENNIAL STREAMS WITH GRAVEL COBBLE SUBSTRATES AND MODERATE TO SWIFT VELOCITIES

PRESENTLY FOUND IN ARAVAIPA CREEK, EAGLE CREEK, VERDE RIVER ABOVE VERDE VALLEY, EAST-WEST- MAIN AND MIDDLE FORKS OF THE GILA RIVER IN NEW MEXICO, AND GILA RIVER FROM SAN PEDRO RIVER TO ASHURST HAYDEN DAM. CRITICAL HABITAT WAS REMOVED IN MARCH 1998.

NAME: AMERICAN PEREGRINE FALCON

FALCO PEREGRINUS ANATUM

STATUS: ENDANGERED

CRITICAL HAB No RECOVERY PLAN: Yes CFR: 35 FR 16047, 10-13-70; 35

DESCRIPTION: A RECLUSIVE, CROW-SIZED FALCON SLATY BLUE ABOVE WHITISH
BELOW WITH FINE DARK BARRING. THE HEAD IS BLACK AND APPEARS
TO BE MASKED OR HELMETED. WINGS LONG AND POINTED. LOUD
WAILING CALLS ARE GIVEN DURING BREEDING PERIOD.

FR 8495, 06-02-70

ELEVATION

RANGE: 3500-9000 FT.

COUNTIES: MOHAVE COCONINO NAVAJO APACHE SANTA CRUZ MARICOPA COCHISE YAVAPAI GILA PINAL PIMA
GREENLEE GRAHAM

HABITAT: CLIFFS AND STEEP TERRAIN USUALLY NEAR WATER OR WOODLANDS WITH ABUNDANT PREY

THIS IS A WIDE-RANGING MIGRATORY BIRD THAT USES A VARIETY OF HABITATS. BREEDING BIRDS ARE YEAR-ROUND RESIDENTS. OTHER BIRDS WINTER AND MIGRATE THROUGH ARIZONA. SPECIES IS ENDANGERED FROM REPRODUCTIVE FAILURE FROM PESTICIDES. SPECIES HAS BEEN PROPOSED FOR DELISTING (63 FR 45446) BUT STILL RECEIVES FULL PROTECTION UNDER ESA

LISTED, PROPOSED, AND CANDIDATE SPECIES FOR THE FOLLOWING COUNTY:

GREENLEE

1/14/99

NAME: CACTUS FERRUGINOUS PYGMY-OWL

GLAUCIDIUM BRASILIANUM CACTORUM

STATUS: ENDANGERED

CRITICAL HAB Yes RECOVERY PLAN: No CFR: 62 FR 10730, 3-10-97

DESCRIPTION: SMALL (APPROX. 7"), DIURNAL OWL REDDISH BROWN OVERALL WITH CREAM-COLORED BELLY STREAKED WITH REDDISH BROWN. SOME INDIVIDUALS ARE GRAYISH BROWN

ELEVATION

RANGE: <4000 FT.

COUNTIES: MARICOPA, YUMA, SANTA CRUZ, GRAHAM, GREENLEE, PIMA, PINAL, GILA, COCHISE

HABITAT: MATURE COTTONWOOD/WILLOW, MESQUITE BOSQUES, AND SONORAN DESERT SCRUB

RANGE LIMIT IN ARIZONA IS FROM NEW RIVER (NORTH) TO GILA BOX (EAST) TO CABEZA PRIETA MOUNTAINS (WEST). ONLY A FEW DOCUMENTED SITES WHERE THIS SPECIES PERSISTS ARE KNOWN, ADDITIONAL SURVEYS ARE NEEDED. LISTING EFFECTIVE APRIL 9, 1997. PROPOSED CRITICAL HABITAT IN PIMA, COCHISE, PINAL, AND MARICOPA COUNTIES (64 FR 71821).

NAME: MEXICAN SPOTTED OWL

STRIX OCCIDENTALIS LUCIDA

STATUS: THREATENED

CRITICAL HAB No RECOVERY PLAN: Yes CFR: 56 FR 14678, 04-11-91

DESCRIPTION: MEDIUM SIZED WITH DARK EYES AND NO EAR TUFTS. BROWNISH AND HEAVILY SPOTTED WITH WHITE OR BEIGE.

ELEVATION

RANGE: 4100-9000 FT.

COUNTIES: MOHAVE, COCONINO, NAVAJO, APACHE, YAVAPAI, GRAHAM, GREENLEE, COCHISE, SANTA CRUZ, PIMA, PINAL, GILA, MARICOPA

HABITAT: NESTS IN CANYONS AND DENSE FORESTS WITH MULTI-LAYERED FOLIAGE STRUCTURE

GENERALLY NESTS IN OLDER FORESTS OF MIXED CONIFER OR PONDEROSA PINE/GAMBEL OAK TYPE, IN CANYONS, AND USE VARIETY OF HABITATS FOR FORAGING. SITES WITH COOL MICROCLIMATES APPEAR TO BE OF IMPORTANCE OR ARE PREFERRED.

NAME: SOUTHWESTERN WILLOW FLYCATCHER

EMPIDONAX TRAILLII EXTIMUS

STATUS: ENDANGERED

CRITICAL HAB Yes RECOVERY PLAN: No CFR: 60 FR 10694, 02-27-95

DESCRIPTION: SMALL PASSERINE (ABOUT 6") GRAYISH-GREEN BACK AND WINGS, WHITISH THROAT, LIGHT OLIVE-GRAY BREAST AND PALE YELLOWISH BELLY. TWO WINGBARS VISIBLE. EYE-RING FAINT OR ABSENT.

ELEVATION

RANGE: <8500 FT.

COUNTIES: YAVAPAI, GILA, MARICOPA, MOHAVE, COCONINO, NAVAJO, APACHE, PINAL, LA PAZ, GREENLEE, GRAHAM, YUMA, PIMA, COCHISE, SANTA CRUZ

HABITAT: COTTONWOOD/WILLOW & TAMARISK VEGETATION COMMUNITIES ALONG RIVERS & STREAMS

MIGRATORY RIPARIAN OBLIGATE SPECIES THAT OCCUPIES BREEDING HABITAT FROM LATE APRIL TO SEPTEMBER. DISTRIBUTION WITHIN ITS RANGE IS RESTRICTED TO RIPARIAN CORRIDORS. DIFFICULT TO DISTINGUISH FROM OTHER MEMBERS OF THE EMPIDONAX COMPLEX BY SIGHT ALONE. TRAINING SEMINAR REQUIRED FOR THOSE CONDUCTING FLYCATCHER SURVEYS. CRITICAL HABITAT ON PORTIONS OF THE 100-YEAR FLOODPLAIN ON SAN PEDRO AND VERDE RIVERS; WET BEAVER AND WEST CLEAR CREEKS, INCLUDING TAVASCI MARSH AND ISTER FLAT; THE COLORADO RIVER, THE LITTLE COLORADO RIVER, AND THE WEST, EAST, AND SOUTH FORKS OF THE LITTLE COLORADO RIVER, REFERENCE 60 CFR: 62 FR 39129, 7/22/97.

1/14/99

3) CANDIDATE

TOTAL= 2

NAME: GILA CHUB

GILA INTERMEDIA

STATUS: CANDIDATE

CRITICAL HAB No RECOVERY PLAN: No CFR:

DESCRIPTION: DEEP COMPRESSED BODY, FLAT HEAD. DARK OLIVE-GRAY COLOR ABOVE, SILVER SIDES. ENDEMIC TO GILA RIVER-BASIN.

ELEVATION

RANGE: 2000 - 3500 FT.

COUNTIES: SANTA CRUZ, GILA, GREENLEE, PIMA, COCHISE, GRAHAM, YAVAPAI

HABITAT: POOLS, SPRINGS, CIENEGAS, AND STREAMS

MULTIPLE PRIVATE LANDOWNERS, INCLUDING THE NATURE CONSERVANCY, THE AUDUBON SOCIETY, AND OTHERS. ALSO FT. HUACHUCA. SPECIES ALSO FOUND IN SONORA, MEXICO.

NAME: CHIRICAHUA LEOPARD FROG

RANA CHIRICAHUENSIS

STATUS: CANDIDATE

CRITICAL HAB No RECOVERY PLAN: No CFR:

DESCRIPTION: CREAM COLORED TUBERCULES (spots) ON A DARK BACKGROUND ON THE REAR OF THE THIGH, DORSOLATERAL FOLDS THAT ARE INTERRUPTED AND DEFLECTED MEDIALY, AND A CALL GIVEN OUT OF WATER DISTINGUISH THIS SPOTTED FROG FROM OTHER LEOPRD.

ELEVATION

RANGE: 3000-8300 FT.

COUNTIES: SANTA CRUZ, APACHE, GILA, PIMA, COCHISE, GREENLEE, GRAHAM, YAVAPAI, COCONINO, NAVAJO

HABITAT: STREAMS, RIVERS, BACKWATERS, PONDS, AND STOCK TANKS THAT ARE FREE FROM INTRODUCED FISH AND BULLFROGS

REQUIRE PERMANENT OR NEARLY PERMANENT WATER SOURCES. POPULATIONS NORTH OF THE GILA RIVER ARE THOUGHT TO BE CLOSELY-RELATED, BUT DISTINCT, UNDESCRIBED SPECIES. SPECIES ALSO FOUND ON FORT HUACHUCA

TABLE E-1
SPECIAL STATUS SPECIES
Special Status Species Likely to Occur in the Habitats Traversed by the Preferred Alternative Corridors
for the Greenlee to Morenci 345kV Transmission Line Project

KEY:

Federal Status
 E = Endangered
 T = Threatened
 C = Candidate
 BLMS = BLM Sensitive

State Status - Wildlife
 WC = Wildlife of Special Concern in Arizona

State Status - Plant
 ANPL = Arizona Native Plant Law
 sr = salvage restricted

Species		Scientific Name	Habitat Type	Status		Occurrence Known or Potential
Common Name				Federal	State	
BIRDS						
American peregrine falcon		<i>Falco peregrinus anatum</i>	variety, steep area with cliffs near water	E		low potential for foraging; no nest sites; primarily migratory
Cactus ferruginous pygmy-owl		<i>Glaucidium brasilianum cactorum</i>	riparian habitats in desertscrub	E		low to no potential, east of known historic range
Southwestern willow flycatcher		<i>Empidonax traillii eximius</i>	riparian	E		low to no potential, limited riparian habitat along San Francisco; no critical habitat in the project area
Mexican spotted owl		<i>Strix occidentalis lucida</i>	forested canyons	T		no suitable habitat
Common black-hawk		<i>Buteo gallus anthracinus</i>	riparian habitat along perennial streams		WC	
AMPHIBIANS						
Chiricahua leopard frog		<i>Rana chiricahuensis</i>	found mainly in rocky areas within permanent streams	C		low potential
FISH						
Apache trout		<i>Onchorhynchus apache</i>	cold, mountain streams	T		no potential, no habitat
Loach minnow		<i>Tatiroga cobitis</i>	perennial streams with swift shallow water and gravel bottom	T		no potential, known habitat is northwest of the project area
Razorback sucker		<i>Xyrauchen texanus</i>	streams and rivers with slow back-water areas and eddies	E		no potential, no critical habitat in the project area
Spikedace		<i>Meda fulgida</i>	moderate-fast flowing perennial streams with gravel substrates	T		no potential, no critical habitat within the project area
Gila chub		<i>Gila intermedia</i>	pools, springs, cienegas, and streams	C		no potential, known range not within project area
PLANTS						
Arizona hedgehog cactus		<i>Echinocereus triglochidiatus arizonicus</i>	oak woodland/chaparral to desertscrub habitats	E		low to moderate potential for occurrence adjacent to San Francisco River
San Carlos buckwheat		<i>Eriogonum capillare</i>	grasslands, 2,000 to 3,000 feet elevation		ANPL sr	low potential



EXHIBITS