ENVIRONMENTAL ASSESSMENT

DOE/EA-0289

NEW WADDELL-WESTWING 230-KV TRANSMISSION LINE PROJECT MARICOPA COUNTY, ARIZONA

October 1988

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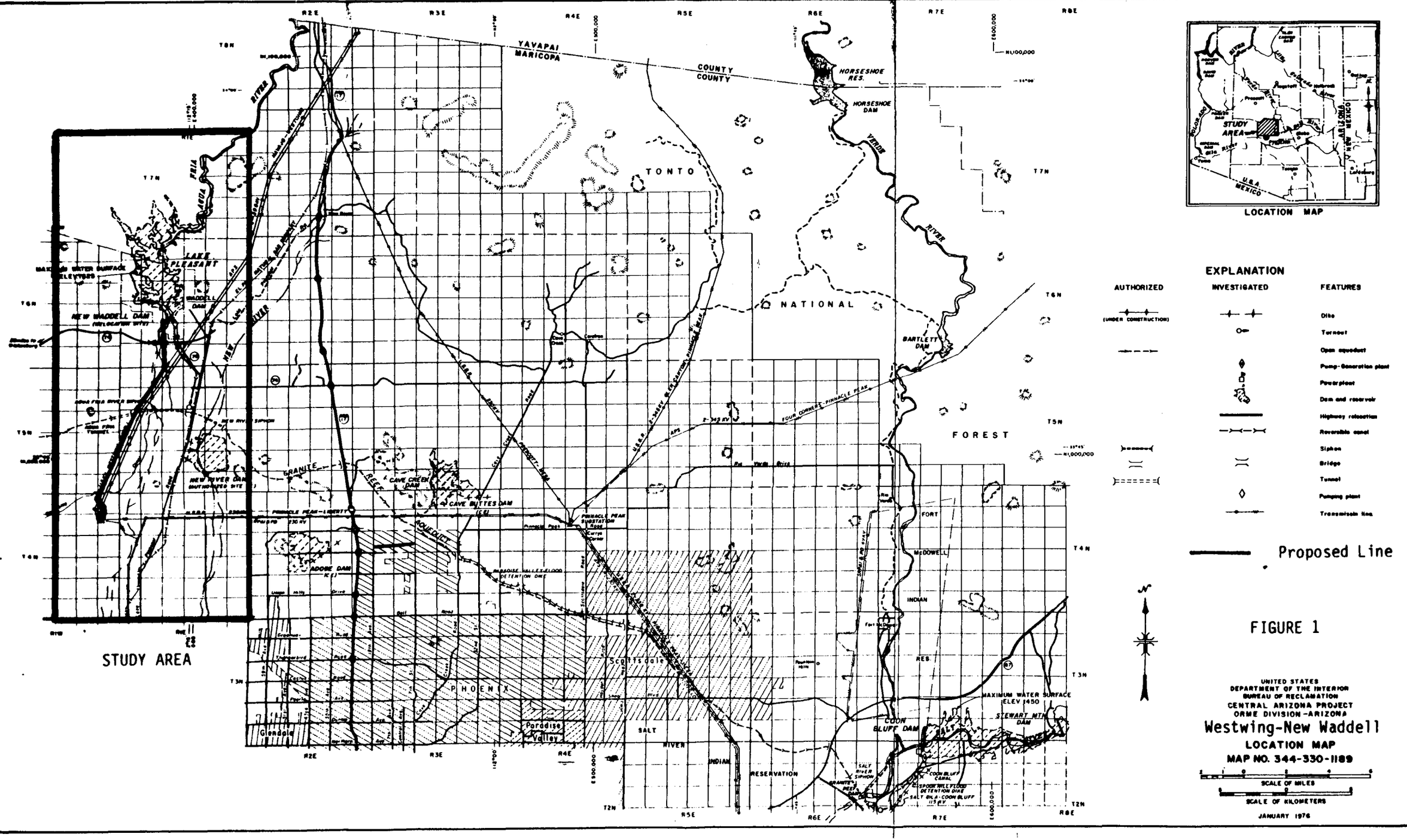
U.S. DEPARTMENT OF ENERGY
WESTERN AREA POWER ADMINISTRATION

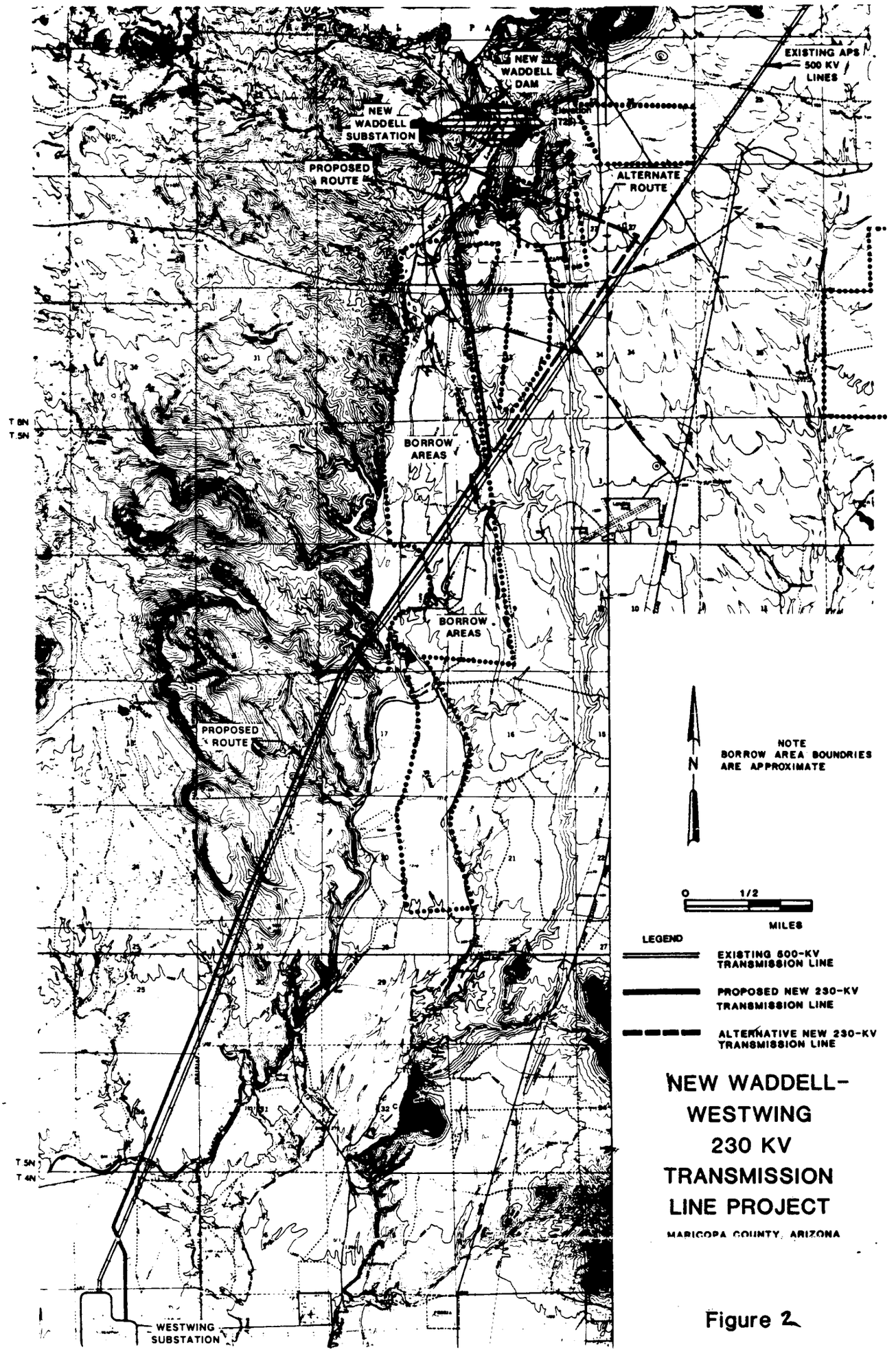
DISCLAIMER

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES


YAVAPAI COUNTY
MARICOPA COUNTY
TONTO NATIONAL FOREST
LAKE PLEASANT
NEW WADDELL DAM
NEW RIVER DAM
CAVE BUTTES DAM
ADOBE DAM
HORSESHOE RES.
HORSESHOE DAM
BARTLETT DAM
VERDE RIVER
AGUA FRIA RIVER
NEW RIVER
GRANITE REEF AQUEDUCT
CENTRAL ARIZONA PROJECT
PINNACLE PEAK SUBSTATION
FOUR CORNERS-PINNACLE PEAK
PARADISE VALLEY-ELOOD DETENTION DIKE
SPOOKHILL FLOOD DETENTION DIKE
SALT RIVER SIPHON
COON BLUFF CANAL
COON BLUFF DAM
STEWART MTN. DAM
MAXIMUM WATER SURFACE ELEV 1450
FORT McDOWELL INDIAN RES.
SALT RIVER INDIAN RESERVATION
PHOENIX
Scottsdale
Paradise Valley
Glendale
STUDY AREA
LOCATION MAP
EXPLANATION
AUTHORIZED
INVESTIGATED
FEATURES
(UNDER CONSTRUCTION)
Dike
Turnout
Open aqueduct
Pump-Generation plant
Powerplant
Dam and reservoir
Highway relocation
Reversible canal
Siphon
Bridge
Tunnel
Pumping plant
Transmission line
Proposed Line
FIGURE 1
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
CENTRAL ARIZONA PROJECT
ORME DIVISION-ARIZONA
Westwing-New Waddell
LOCATION MAP
MAP NO. 344-330-1189
SCALE OF MILES
SCALE OF KILOMETERS
JANUARY 1976



NEW WADDELL-WESTWING 230 KV TRANSMISSION LINE PROJECT

MARICOPA COUNTY, ARIZONA

Figure 2

I. INTRODUCTION

The Western Area Power Administration (Western) proposes to construct a new 230 kilovolt (kV) transmission line in Maricopa County, Arizona, that would extend from the New Waddell Dam on the Agua Fria River, to the Westwing Substation, about 10.5 miles southwest of the dam (Figures 1 and 2). The project area is roughly 45 miles northwest of the Phoenix metropolitan area. The transmission line will be owned by the U.S. Bureau of Reclamation (BuRec); however, design, construction, operation, and maintenance will be provided by Western. Western will also complete the National Environmental Policy Act of 1969 (NEPA) process for the line. Construction of the CAP Regulatory Storage Division was authorized by section 391 (a)(3) of the Colorado River Basin Project Act (Public Law 90-537) of 1968. New Waddell Dam and associated facilities were selected as parts of the BuRec's Plan 6. A final environmental impact statement (EIS) was prepared by BuRec to describe the environmental impacts associated with alternatives for the construction and operation of the Regulatory Storage Division of the Central Arizona Project (CAP) (INT-FES 84-4). The EIS was supported by 23 technical reports that covered planning, design, public involvement, social and environmental impact assessment, economics, and hydrological analysis. Since the proposed transmission system differs only slightly from that described in the EIS, Western incorporates by reference the EIS and its 23 supporting technical reports into this environmental assessment (EA). In August 1985, BuRec

completed an EA on modifications to the New Waddell Dam Project design plans and issued a FONSI on these modifications; the EA did not cover the transmission line.

This EA was prepared by Western to comply with NEPA, the Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (40 CFR Parts 1500-1508), the Department of Energy (DOE) Guidelines for Compliance with NEPA (52 FR 47662), the National Historic Preservation Act, and other applicable environmental legislation. The purpose of this EA is to document the potential environmental effects of the proposed construction of the transmission line and switchyards in order to determine if an EIS is needed or if a finding of no significant impact (FONSI) is indicated.

II. BACKGROUND

New Waddell Dam, one of the water storage and regulatory features for CAP, will be located on the Agua Fria River in Maricopa County, Arizona, about one-half mile downstream of the existing Waddell Dam and its reservoir, Lake Pleasant. With a dam crest height of 1730 feet and a planned water elevation maximum of 1,702 feet, New Waddell Dam and the new Lake Pleasant will flood the existing facilities and add 137,600-acre-feet of water per year to the CAP water supply.

The New Waddell Dam Pumping and Generating Plant (plant) will be located below the dam near the right abutment, about 300 feet downstream of the new dam. Under the plan, the Waddell Canal will be connected to the new Lake Pleasant

Reservoir. Water will be diverted into and out of Lake Pleasant storage through the pumping and generating plant at rates up to 3,000 cubic feet per second (cfs). Water released from storage will be passed through the plant and used to generate hydroelectricity. Released water would enter the CAP Granite Reef Aqueduct from the Waddell Canal.

Regulatory storage operations will provide not only for seasonal storage regulation, but will also allow CAP to take advantage of available inexpensive winter offpeak pumping energy to pump Colorado River water into the Granite Reef Aqueduct system. During the summer months, when both water and pumping energy demands will be high, water will be released from storage to the aqueduct and needed higher cost pumping energy generated at the same time. In addition to its CAP functions, the New Waddell Dam will provide flood control.

The proposed New Waddell-Westwing 230-kV Transmission Line would interconnect the New Waddell Dam Pumping and Generating Plant with the area's power transmission system via a connection at Westwing Substation. This interconnection will allow a portion of CAP's summer pumping power demands to be met with the generation from the New Waddell Dam Plant. During the winter off-season the line would be used to deliver electrical power to the plant to pump water back into Lake Pleasant. This water would be stored until needed during the following summer.

Westwing Substation is the logical termination point for the proposed line, as it is only 10.5 miles from the plant, and it is the southern terminus of the CAP Navajo Transmission System. It has existing 230-kV capability, strong bus, high reliability, and adequate space for additional facilities.

Further information on the background of the proposed project can be found in the CAP EIS and technical reports.

III.SUMMARY

The proposed transmission line would have little effect on the environment. The proposed project is to construct a 10.5-mile transmission line that would be, for the most part, adjacent to two similar transmission lines. Analysis of the proposed action and its potential effects on various environmental components showed that the project would not significantly affect climate, air quality, noise levels, topography, or geology.

No significant impact would occur to vegetation or wildlife as a result of the project. Minimal or no clearing of vegetation would be necessary due to the presence of existing roads and a good access road network, except in the first two miles and last half-mile of the right-of-way (ROW). The new line would not pose a raptor electrocution hazard. No impacts to threatened or endangered species would be expected. The State of Arizona would have the opportunity to mark and remove plant species of State concern from construction areas, in accordance with the Arizona Native Plant Law.

Visual resources would not be significantly affected due to the presence of two existing 500-kV transmission lines that the new 230-kV line would parallel for about 8 of the 10.5 miles. The new line would be constructed using lattice steel structures similar to those of the two existing 500-kV lines.

Land ownership, land use, and socioeconomics would not be significantly affected. The land in the area is mainly controlled by State, Federal, and county agencies. Land use would not be impacted as the project would be located in an undeveloped desert area adjacent to similar facilities or through previously disturbed borrow areas. The temporary nature of construction would negate any potential for long-term social or economic impacts; short-term impacts should be positive, although probably insignificant, for retailers of goods and services.

Cultural resources would not be affected by the proposed project. Hohokam sites in the project vicinity have been previously investigated through mitigation studies conducted in the Agua Fria River borrow areas (Green 1986). Surveys of the proposed ROW have not located any significant cultural resources sites. The discovery of cultural resources during construction would result in a halt in construction activity in the vicinity of the discovery until the site could be properly evaluated.

Although about two miles of the proposed line route would be in a designated floodplain, the floodplain is located just downstream of the New Waddell Dam. It is assumed that the risk of flooding below the dam would be remote.

The majority of the new line, about 8.5 miles, would be located outside the floodplain. Structures that would be located within the floodplain will be designed with floodproofing measures, such as deeper footings, if necessary.

IV. PURPOSE AND NEED

The purpose and need for the proposed project have been covered in general terms in the CAP EIS (INT FES 84-4) and in the New Waddell Dam EA (August 1985). This EA addresses only the transmission line as its location and potential impacts were not considered in detail in the previous environmental documents, and because Western has been requested by BuRec to plan, design, and construct the transmission line in addition to operating and maintaining the line once it is built.

Within the context of the larger project, the proposed New Waddell-Westwing 230-kV Transmission Line would allow the transfer of electric power between the New Waddell Dam Pumping-Generating Plant and Westwing Substation. The power flow between these two points would vary depending on the season. During the onpeak summer season, water would be released from Lake Pleasant to meet Granite Reef Aqueduct delivery needs, and electric power would be generated to help meet CAP pumping loads. During the offpeak winter season, when both water and power demands are relatively low, less expensive power would be used to pump water back into Lake Pleasant. The line would also serve the auxiliary power needs of the dam facility and related development.

The movement of water and generation/consumption of electricity would result in savings of both electrical power costs and water resources to the CAP and represents a beneficial plan to combine and conserve these project resources.

V. ALTERNATIVES INCLUDING THE PROPOSED ACTION

No Action

Under the no action alternative, Western would not design, construct, operate, and maintain the proposed New Waddell-Westwing 230-kV Transmission Line. Electric power generated at the New Waddell Dam Pumping-Generating Plant could not be used, as it would not have a pathway to the power transmission system. Conversely, the plant could not be used in a pumping mode, as there would be no electrical power source. BuRec would undoubtedly construct a similar project should Western select the no action alternative, as the proposed transmission line is an integral part of the previously approved CAP. The no-action alternative is thus not a viable one.

Proposed Action

The proposed action is to construct a new 10.5 mile-long 230-kV transmission line between New Waddell Dam and Westwing Substation. No alternative routes were developed due to the short distance between the terminal points, topographic considerations, and the presence of an existing transmission corridor. Two route options were studied from the dam to the transmission corridor, as shown on the map of the study area, but the northern option was

determined to be less suitable due to severe construction constraints in rugged terrain, the need for new access roads, and increased visual impacts. It was excluded from further consideration.

The proposed project is located in south-central Arizona in Maricopa County, approximately 45 miles northwest of Phoenix. Figure 2 shows the key features and topography of the study area. The proposed New Waddell-Westwing 230-kV Transmission Line would originate at a switchyard associated with the New Waddell Dam and Pumping and Generating Plant. The switchyard would measure approximately 300 feet by 350 feet. From this point, the line would proceed generally southward for approximately two miles where it would meet with the two existing Arizona Public Service (APS) 500-kV transmission lines. A large portion of the area crossed by this segment of the line route would be in or adjacent to borrow areas that will be stripped of soil for the construction of the New Waddell Dam and the proposed New Waddell Canal.

From the point where the APS 500-kV lines are met, the proposed transmission line would parallel these lines the approximately 8.5 miles southwest to the Westwing Substation. This section of the line route would recross the Agua Fria River valley, which is normally dry, and traverse the rolling southeastern margin of the Hieroglyphic Mountains. The southernmost three miles of the line route would cross a relatively flat plain and the Beardsley Canal, and terminate at the existing Westwing Substation. Westwing Substation is located approximately one mile west of the Agua Fria River valley.

The first approximately two miles of ROW from the New Waddell Dam to the juncture with the APS lines will not parallel existing lines. The last half-mile of the line route would diverge from its parallel course about 2,000 feet north of Westwing Substation, cross under the APS lines, and enter Westwing from the north.

The proposed transmission line would be constructed using lattice steel structures (Figure 4) with two ground wires and three 954 KCM ACSR conductors. Typical spans between structures would be approximately 1,700 feet, resulting in an average of about four structures per mile of line. This span length would allow the new lines to match spans and structure locations with the parallel lines. The last few structures at the approach to Westwing Substation will most likely be single steel pole (Figure 3).

New ROW would be required for the proposed line, approximately 8.5 miles of which would be parallel to and abut the west edge of the ROW of the APS lines. A ROW easement of 300 feet will be acquired in order to accommodate the possiblity of a second transmission line in the future. No plans presently exist for any future lines, but past experiences in the rapidly expanding Phoenix area have proven the wisdom of retaining dedicated ROW for future system additions to meet projected area load growth. Additional NEPA documentation would be prepared at the time any new transmission projects are proposed.

TYPICAL
SINGLE-POLE STRUCTURE

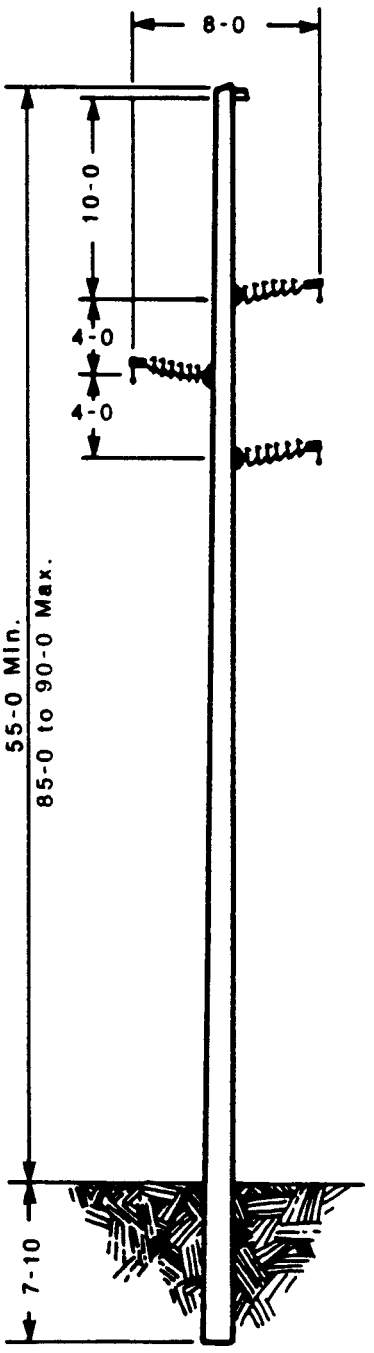
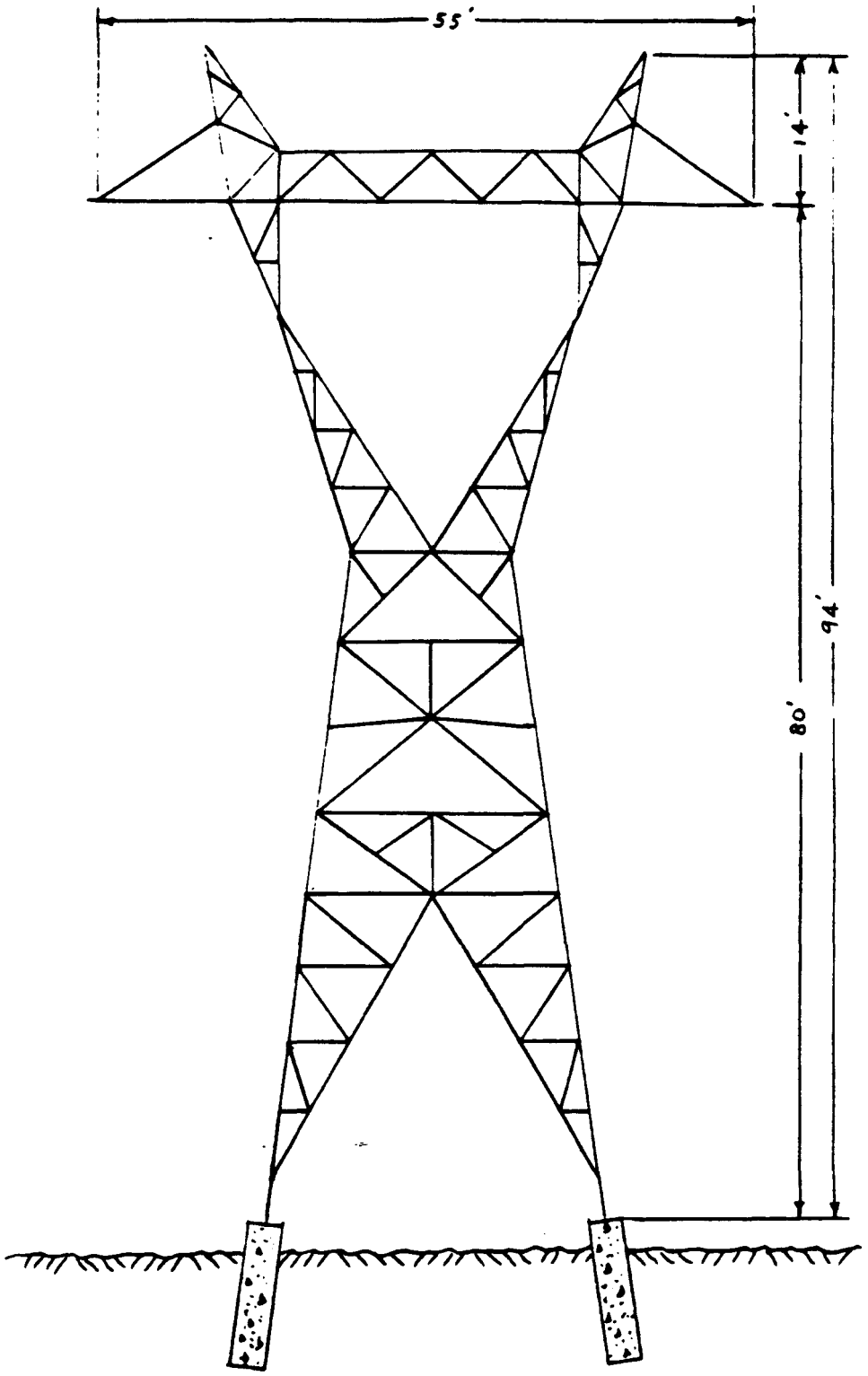


FIGURE 3

NOTE: Dimensions are approximate.



TYPICAL 230kV
STEEL LATTICE STRUCTURE

Note: DIMENSIONS ARE APPROXIMATE.

FIGURE 4

An existing network of roads connects most of the line route. An estimated two miles of new access road will be required in the New Waddell Dam to the APS lines section of the proposed transmission line route. New permanent access roads would not be constructed. Blading of vegetation and soil would be minimized along new access ways and would be required only in rough terrain. Some portions of existing roads may need grading or regrading before and/or after construction, but any such grading would be restricted to these existing road locations.

At the New Waddell Dam, the proposed switchyard will be located in a slight depression on the west side of the Lower Lake. The switchyard would be approximately 300 feet by 350 feet and would be surrounded by a fence. The entire are would be graded and gravelled.

Construction of the transmission line is scheduled to begin in July 1990, and to be completed in July 1991. Construction of the line would include several activities:

1. Surveying. Survey crews would travel along the ROW and spot structure locations and points of intersection (PI) or angle locations.

2. Construct structure foundations and erect structures. Each lattice steel structure would have four concrete footings that would average two feet in diameter and 14 feet in depth. Holes for the footings would be augered. The basal area of these structures would be approximately 25 by 30 feet. Single-pole structures, if used, would be set approximately 14

feet deep in a 4-foot diameter augered hole and may be direct buried or have concrete backfill. Once trucked to the sites, the structure components would be unloaded and partially or fully assembled. The structures would then be lifted into position with a crane and final assembled on their foundations. Pole trucks, truck-mounted augers and winches, and cranes would be used in these activities.

3. Conductor stringing. A reel truck, a tensioner, and a puller would be stationed at intervals along the ROW. Depending on the desired tension and the number and degree of angles in the line, between 10,000 and 16,000 feet of conductor would be pulled from each setup. The conductors would be unreeled from the reel truck and placed in the tensioner, and fed through the stringing blocks to the puller. Lift trucks and pickups would also be required.

4. Adjustment of tension and sag. A sagging cat, hoists, and grips would be used to adjust each conductor pull to the proper tension and sag.

5. Attachment of the conductors to insulators. The line crew would attach the conductors to the insulator assemblies and remove the stringing blocks. Lift trucks and pickups would be used in this activity.

After construction is completed, the new transmission line will be operated and maintained. Routine maintenance will consist of periodic helicopter inspection for damage to structures and conductors. More infrequent will be

ground maintenance, which will consist of spot inspection and repair as a followup to situations noted during helicopter inspections and general maintenance to tighten bolts, inspect foundations, and so forth.

VI. EXISTING ENVIRONMENT

The Setting

This section describes the environmental setting of the proposed project. The environmental factors discussed in the subsections of this chapter are: climate/air quality/noise; topography; geology/soils; floodplains/wetlands; biological resources; visual resources; land ownership/use; socioeconomic resources; and cultural resources. The remainder of this section presents a regional overview of the area through which the transmission line would pass.

The project area lies within the Sonoran Desert Section of the Basin and Range Physiographic Province (USBR 1983, DOE 1983b). It is roughly divided in half by the generally north-south trending Agua Fria River. The area west of the river is characterized by very hilly terrain that breaks sharply at the river bank. East of the river, a series of benches leads up to a sloping desert upland that trends in elevation from northwest to southeast. This upland is dissected by numerous washes. The river is normally a dry, sandy wash.

The Sonoran Desert encompasses the southwestern quarter of Arizona and the adjacent desert areas of California. Common rock substrates in this section include Precambrian granites and gneisses, although the geology is extremely variable. The portion of this province section occupied by the New Waddell-

Westwing Transmission Line Project area is quite dry and is generally one of the hotter areas of Arizona. The hot temperature regime is partially due to the fact that the elevation is low, ranging from about 1,300 feet above mean sea level (msl) at Westwing Substation to about 1,600 feet above msl at the New Waddell Dam site, and partially due to its southerly location. The Sonoran Desert's latitude classifies it as a subtropical desert, rather than as a temperate desert.

The Sonoran is a young desert, having existed in its current form for no more than 10,000 years. It is, however, the most complex of the North American deserts in terms of biological and geological diversity. Areas of more typical Sonoran diversity are evident along the alluvial wash of the Agua Fria River, which is crossed by the proposed line. In this area, several species of cacti, shrubs, and subtrees occur and provide multi-layered habitats for a variety of desert mammals, birds, reptiles, and invertebrates.

Climate/Air Quality/Noise

The climate is typical of southwestern United States deserts and is characterized by long, hot summers; short, mild winters; sparse rainfall; low relative humidity; and high evaporation rates. In this area, the average annual rainfall is 6-10 inches (15-25 cm) and the mean annual air temperature is 68-74 degrees Fahrenheit. The average summer maximum temperature is about 105 degrees and the average winter minimum temperature is 35 degrees (Green and Sellers 1964). The frost-free season is 250 to 300 days. Although limited research has been done, there are indications that the lower Agua Fria

region has become drier over the last 1500 years. The changes have apparently been gradual enough to have had minimal effects on the plant community (Weed 1972).

The variability in mean annual precipitation is typical of desert climate and contributes to the difficulty of survival for most desert organisms (MacMahon 1985). Precipitation is generally biseasonal, occurring in summer (July through September) and winter (December through March). Spring and fall droughts are the norm; the spring drought is associated with higher temperatures and is thus the more severe of two drought periods for most plants and animals (Lowe 1964). The winter and summer rains result from two distinct moisture systems originating in the Pacific Ocean and Gulf of New Mexico, respectively. Winter rains tend to be of low intensity and long duration, and cover fairly large areas. Summer rains are more likely to be convection thunderstorms of high intensity and short duration, and are far more localized (USBR 1983; MacMahon 1985). Intense surface heating during the day and active radiational cooling at night result in diurnal temperature variations averaging 30 degrees Fahrenheit and sometimes exceeding 40 degrees (USBR 1983).

The air quality along the transmission line route is generally good, as there is little human activity that would create high pollutant levels. Near Westwing Substation, air quality is at times affected by varying quantities of haze, smoke, and pollutants from the Phoenix metropolitan area. The level of air pollution in this area is somewhat dependent on seasonal weather patterns, with the winter months of December through March being noted for temperature

inversions that trap pollution, causing a decrease in visibility. In summer, insufficient air movement sometimes results in elevated particulates and other pollutant levels (USBR 1983; DOE 1983).

No air quality data are available from the vicinity of New Waddell Dam. A part of Lake Pleasant, however, is included in the Maricopa County nonattainment area for total suspended particulates (TSP), carbon monoxide (CO), and ozone (O_3). Although there is little development in the area, vehicles traveling to Lake Pleasant Regional Park and Castle Hot Springs are sources of pollutants. However, levels of TSP, CO, and O_3 are not significant, especially when compared with the highly urbanized areas southeast of the project area. While pollutant levels do not generally exceed State and Federal air quality standards at any location along the transmission line route, it can be assumed that pollution drift from the Phoenix metropolitan area does occur near the line's southwestern terminus.

Day-night sound levels within the project area are typically below 55 decibels (dB). The Environmental Protection Agency (EPA) has suggested an annual day-night sound level of less than 55 dB as being requisite to protect public health and welfare. Recent EPA strategy has a short-term goal of day-night sound levels not to exceed 65 dB in residential and recreational areas or other outdoor areas where quiet is the basis for use (USBR 1983).

The Waddell Dam area is minimally developed. Lake Pleasant is used for recreation activities such as boating, water skiing, sailboating, fishing, swimming, picnicking, and camping. The Lower Lake, which serves as an

afterbay to the existing Waddell Dam, was previously a developed recreation area. However, it has been closed to recreation in order to protect the public from dam operations, and to protect the dam facilities. Castle Hot Springs Road and Park Access Road traverse an undeveloped area. The proposed transmission line ROW and borrow areas are currently used for motorcycle and 4-wheel recreation.

Topography

The proposed transmission line route traverses a sloping riverine area to rolling hills. Once across the hills, the route crosses the dry Agua Fria River bed. To the west and across the river, the line climbs fairly steep and highly dissected terrain. The topography levels to a flat arid plain near Westwing Substation.

The somewhat steep, irregular mountain ranges are drained by short branching canyons that open to alluvial fans. The major fans have conspicuous channels that direct the intermittent streamflow into washes along the basin floors. The alluvial fans and the basin floors are largely drained by systems of subparallel shallow gullies that trend downslope. The gully drainages ultimately reach central washes or braided channel areas along the basin floors. The larger of the desert washes and intermittent rivers collect drainage from a number of separate basins (USBR 1974).

Geology and Soils

The study area is composed of sedimentary deposits of alluvial gravel, sand, and silt with some intrusive volcanic rocks mainly of basaltic and andesitic composition (Wilson, et al. 1969). The area includes Precambrian metamorphic rocks, Tertiary volcanics and sediments, and Quaternary alluvium. The foundation of the New Waddell Dam site consists of interbedded andesite, tuff, tuffaceous sandstone, and conglomerate.

The soils occurring along the proposed transmission line route are mainly loam and clay loams of the Mohall-Laveen association, which formed in alluvium derived from a wide variety of parent materials. Typically, they are nearly level with slopes generally less than 1 percent. "These soils are used for irrigated cropland, seasonal grazing, home and industrial sites, recreations and wildlife habitat," (Hartman 1973:7). Other soils in the ROW vary in composition from loamy, clayey, sandy, to gravelly.

Depth of highly-compacted material varies in the study area from less than 4 feet to over 15 feet (1.2-4.6 m). These data are based on logs from test pits excavated by BuRec to determine the abundance of construction materials.

Seismicity. There are numerous faults within the study area; however, there is no evidence of Quaternary movement near the damsite. There have been no recorded earthquakes originating from this area, therefore a large damaging earthquake is not expected. Although the area has low rates of tectonic activity, the maximum earthquake capable of occurring on the numerous small faults in the seismotectonic province could range from 5.5 to 6.5 (USBR 1984).

Minerals. Uranium-bearing strata are widespread and have been exposed by tributaries to the Agua Fria River at the northern part of Lake Pleasant. Claims were filed in portions of the study area; however, subsequent exploration programs failed to reveal significant amounts of uranium. Recently, there has been mineral activity by groups and individuals exploring for various precious metals, and several oil and gas leases have been filed. As of 1982, no oil or gas deposits have been found (USBR 1984).

Floodplains/Wetlands

The hydrological regime in the vicinity of the transmission line route is such that surface water flows only on an intermittent basis in conjunction with significant precipitation. Groundwater occurs in the thick alluvial deposits and bedrock margins of the desert basins. The closest groundwater to the surface is under and adjacent to major stream channels within the basins, with depths to water generally in the range of 100 to 500 feet (USBR 1974).

NEPA, Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands), and DOE Guidelines (10 CFR Part 1022) require the review of floodplains and wetlands. Floodplains are "lowland adjoining inland waters including, at a minimum, that area inundated by a one percent or greater chance of flooding in any given year." DOE defines wetlands as "those areas that are inundated by surface or groundwater with a frequency sufficient to support vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction."

Information on potential floodplains and wetlands along the transmission line route was obtained from maps provided by the Federal Emergency Management Agency's (FEMA) National Floodplain Insurance Program. Input was also solicited from the Maricopa County Flood Control District. In addition, an aerial reconnaissance of the entire length of the ROW was conducted along with an on-the-ground reconnaissance of much of the route in order to identify any potential floodplains and/or wetlands. No wetlands are located along the New Waddell-Westwing 230-kV Transmission Line route; however, a cattail marsh occurs in the afterbay area. This area will not be affected by the proposed transmission line.

The FEMA Flood Hazard Boundary maps indicate the proposed line route crosses the Agua Fria River Floodplain Zone A in two locations. The structures which lie within Zone A may be affected by floods which occur on an average of once every 100 years (Figure 5).

Biological Resources

Vegetation. The New Waddell damsite and associated facilities are located within the Lower Colorado Subdivision of the Sonoran Desertscrub Formation (Brown and Lowe 1980; Turner and Brown 1982). The following description of vegetation is based on field investigation.

Vegetation in the desert uplands surrounding the project area is characterized as a palo verde-mixed cacti community. Dominant plant species include foothills palo verde (Cercidium microphyllum), blue palo verde (Cercidium floridum), ironwood (Olneya tesota), mesquite (Prosopis juliflora),

creosotebush (Larrea tridentata), bursage (Franseria deltoidea), brittlebush (Encelia farinosa), prickly pear and cholla cacti (Opuntia spp.), saguaro cactus (Cereus giganteus), and ocotillo (Fouquieria splendens).

Dominant species occurring in the Agua Fria River floodplain include creosotebush, foothills palo verde, ironwood, and mesquite. Bursage, barrel cactus (Ferocactus spp.), and prickly pear are also found scattered throughout this area.

In the vicinity of the Westwing Substation, the creosote bush-bursage community is the dominant vegetation type. In general, the vegetation resources of the area are rather typical of large portions of the arid Southwest and are dominated by an association of creosote-bursage and palo verde-mixed cacti (Arizona Flora 1960).

Special Status Plant Species

No federally listed, proposed, or protected plant species are known to inhabit the project area. Western has coordinated with the U.S. Fish and Wildlife Service (FWS) and the Bureau of Land Management (BLM) in order to identify and address any concerns these agencies may have with regard to special status plant species.

The State of Arizona protects certain plant species under the Arizona Native Plant Law and through the Arizona Natural Heritage Program and the Arizona Commission of Agriculture and Horticulture. A list of State-protected groups of plants is given in Table 1. Of these State-protected species, ocotillo and

ironwood and the cacti--saguaro, barrel cactus, and chollas--are the most likely to be found in the vicinity of the New Waddell-Westwing Project. A special permit is required to remove or collect these plants, and the State may require the removal and preservation of individuals of these species from areas on the ROW that will be impacted by the proposed project.

Other State protected species may occur in the project area. However, many of these are spring-blooming plants that are very difficult to locate during the rest of the year.

Wildlife. The natural wildlife habitat within the study area is desert scrub. Within this general vegetation type are several gradations of plant species diversity and, therefore, wildlife habitat diversity. This variability is tied to elevation, topography, and moisture conditions, as described in the preceding sections. The least utilized habitat along the ROW in terms of number of wildlife species is the lowland creosote bush-bursage association. Little food or cover is available to wildlife in this community, therefore, few species use these areas. The washes and drainages along the ROW typically provide a slightly higher diversity of both plant species and cover than does the surrounding lowland desert, thus supplying more and better quality wildlife habitat. The higher elevation portions of the basins and the upper bajadas support various shrubs and cacti, including scattered saguaro. Saguaro have a high value to many wildlife species in terms of food and habitat and are of particular importance to cavity-nesting birds (DOE 1983a).

Wildlife species typically occurring in the desert scrub habitat include

large, medium, and small mammals such as javelina (Pecari tajacu), mule deer (Odocoileus hemionus), coyote (Canis latrans), kit fox (Vulpes macrotis), badger (Taxidea taxus), black-tailed jackrabbit (Lepus californicus), desert cottontail (Sylvilagus audubonii), Harris antelope squirrel (Citellus harrisii), Merriam's kangaroo rat (Dipodomys merriami), cactus mouse (Peromyscus eremicus), and white-throated woodrat (Neotoma albigula).

Gamebirds and non-gamebirds, such as white-winged dove (Zenaida asiatica), mourning dove (Zenaidura macroura), Gambel's quail (Lophortyx gambelii), roadrunner (Geococcyx californianus), red-tailed hawk (Buteo jamaicensis), American kestrel (Falco sparverius), cactus wren (Campylorhynchus brunneicapillus), verdin (Auriparus flaviceps), western screech owl (Otus kennicottii) and elf owl (Micrathene whitneyi) are also common.

Reptiles typically found are lizards such as banded gecko (Coleonyx variegatus) and chuckwalla (Sauromalus obesus), and snakes including the sidewinder rattlesnake (Crotalus cerastes) and the western coachwhip (Masticophis flagellum).

Amphibians are not abundant in the Sonoran Desert, due primarily to the paucity of open water. They are most commonly seen after heavy summer rains. Spadefoots (Scaphiophus spp.) and true toads (Bufo spp.) are the most likely inhabitants of desert scrub (MacMahon 1985, Lowe 1964).

Special Status Wildlife Species. Although no federally listed species are known to occur along the line route, the southern bald eagle (Haliaeetus leucocephalus), an endangered species, is known to nest on Pleasant Lake

(Spear 1984). The new transmission line is unlikely to adversely affect the nesting pair, which have been addressed in the BuRec environmental documentation (FWS 1985). The nest site is located approximately four miles from the New Waddell Dam site at the north end of Lake Pleasant.

State species of concern include the Gila monster (Heloderma suspectum), and desert tortoise (Gopherus agassizi). These are listed by the Arizona Department of Game and Fish as Group III species, which correspond closely to Federal threatened species. These species are all desert scrub species and may occur throughout the study area in small numbers. Overcollecting, habitat degradation, and offroad vehicle use are the major factors affecting the populations of these species. Gila monsters prefer rocky hillsides and washes. The desert tortoise requires firm, but not hard, ground for its burrows. It generally occurs along river banks and washes where there are abundant grasses, low-growing cacti, and other herbaceous plants for food and cover.

Visual Resources

The BLM Visual Resource Management (VRM) system was used in assessing the quality of the visual resource along the proposed transmission line route. The VRM system, fully described in BLM Manual 8400, allows the objective evaluation of an essentially subjective resource. The system is used to evaluate three major components of the visual resource--scenic quality, visual

sensitivity, and distance zones--by assigning specific values to each component. The proposed New Waddell-Westwing Transmission Line route was rated as follows for each of the identified components:

1. Scenic Quality Classes: This component is made up of Classes A, B, and C, with Class A having the most characteristic denoting a "scenic landscape" and Class C the least. A small amount of Class A landscape is associated with the shoreline of Lake Pleasant, especially at the northern end. Class B areas include the balance of Lake Pleasant shoreline, the riparian area around the Lower Lake, and the west bank of the Agua Fria River valley where it meets the Hieroglyphic Mountains. The rest of the study area is rated as Class C.

2. Visual Sensitivity: Categorized as high, moderate and low; visual sensitivity is a function of three variables: the attitudes of the people using the area, the number of people who view the area, and the portion of the landscape that can be seen. Visual sensitivity is high from Lake Pleasant, moderate from the road leading into the Lake Pleasant area and in the vicinity of the Lower Lake, and low throughout the rest of the study area.

3. Distance Zones: Distance zones are classed as foreground/middleground, background, and seldom seen areas. Much of the proposed route falls into the seldom seen category, as few roads are found near the alignment, and there is little opportunity to view the proposed line route. Nearer to

Lake Pleasant, however, the northernmost 1.5 miles of the propose line would move into the foreground/middleground zone for viewers using the access road to Lake Pleasant or the recreation facilities associated with the Lower Lake. Very little of the proposed transmission line would be visible from Lake Pleasant.

The VRM system derives Visual Management Classes by combining scenic quality classes (A, B, C), visual sensitivity levels (high, moderate, low), and distance zones (foreground/middleground, background, seldom seen). Combinations of the nine categories fall into four Visual Management Classes--Classes I through IV. Given the general values presented above, it becomes clear that the Lake Pleasant area is Class I, the Lower Lake and approach to Lake Pleasant is Class II, and the remainder of the study area is Class III and IV. Each class has specific visual management objective and criteria for determining the impact of a proposed project on the visual resource.

Land Ownership/Use

Land ownership along the proposed transmission line is predominantly public, managed by the State of Arizona. Federal lands consist of one small portion of BLM land, comprising only 0.1 percent of the line route. State lands make up 82 percent of the total, and privately-owned land is 15.7 percent of the total. APS owns 2.2 percent of the land crossed by the proposed project.

Land use throughout the area is primarily undeveloped open desert, although privately-owned lands may be developed in the future for housing tracts, due to the proximity to the Phoenix area and the growth trend in the region.

The major developed land use in the proposed project area is the Lake Pleasant Regional Park, which includes Waddell Dam and Lake Pleasant, the Lower Lake, and associated maintenance, recreational and overlook facilities. Other significant developed areas include landing strips in section 3 and 33 of T5N, R1E, the Raceway Canyon facility, A Day in the West ghost town, and the roads to Castle Hot Springs and Lake Pleasant. Residential development is occurring east and south of the proposed project area.

Little mining activity has occurred in the proposed project area. Scattered sand and gravel extractive sites are found; the borrow area south of the New Waddell Dam site will soon be a highly disturbed extractive site.

Recreational use of the open desert is limited, especially during the hot summer months. During the cooler months, offroad vehicle use and rockhounding are the major activities. The area outside of the park boundaries may be lightly hunted.

Cultural Resources

The archaeological sites located within the project area are predominantly small Hohokam habitation and agricultural sites. Evidence indicates that

trade networks were established between this area and the Salt River Valley. In the project vicinity, most known sites are associated with the dry valley of the Agua Fria River and the series of benches to the east.

The project area has now been extensively surveyed for cultural resources. Surveys include those conducted for the APS 500-kV transmission line ROW (Fiero et al. 1981), Westwing Substation site (Weaver 1974), Central Arizona Water Control Study (Rice and Bostwick 1986), and the Agua Fria River borrow areas (ACS 1985, Green 1985, 1986). Any required mitigation for sites identified during these surveys has been completed.

The Arizona State Historic Preservation Officer (SHPO) has been consulted with concerning the proposed project, and has concurred that no further work appears to be needed for compliance with Section 106 of the National Historic Preservation Act (Letter from SHPO to Bureau of Reclamation, November 30, 1987).

Socioeconomics

Maricopa County is located in central Arizona, is the most populous and economically diverse area in the State, and has a population of 1,519,000 (1980 census). Business activity and 92 percent of the county's inhabitants are concentrated in the Phoenix metropolitan area. The economy of the county is dominated by manufacturing, trade services, and government. The majority of the county's economic activities are centered in the Phoenix metropolitan area.

Although Phoenix itself is about 45 miles from the project area, the metropolitan area extends to within three miles of Westwing Substation. Given the relatively large available work force in the metropolitan area, the size of Phoenix, and the relatively small size of the anticipated work force for the proposed transmission line construction (i.e., 10 to 20 workers), it is assumed that sufficient workers with the appropriate skills for transmission line construction currently reside in Maricopa County, thus eliminating a need for worker importation and additional housing. On the basis of this assumption, specific data were not collected with regard to labor force, unemployment rates, or housing vacancy rates.

VII. ENVIRONMENTAL CONSEQUENCES

Climate/Air Quality/Noise

The proposed project will have no effect on the climate. Construction activities may result in localized increases in airborne dust; however, the area often has moderate levels of background particulates from winds passing over the relatively bare sandy, dry soils. Any noticeable adverse effects will be short-term and will cease with the completion of construction.

Emissions from construction vehicles will also be present, but will be insignificant and will also cease with the completion of construction.

Noise from construction activities will not be a significant problem due to its short-term nature and the fact that most construction will occur in

relatively unpopulated areas. Audible noise from the completed transmission line will be at a very low level, and, in any case, less than that due to the existing 500-kV transmission lines.

Topography

With the exception of minor regrading on existing access roads and some clearing of rocks on structure sites, the topography of the area will be unaffected by the proposed project.

Geology/Soils

The geology of the area will be essentially unaffected by the construction of the proposed project. Soils may undergo some degree of compaction from vehicle movement, but many have a desert erosion pavement of pebbles and stones that will reduce the potential for compaction and erosion due to runoff. Visual inspection of the ROW for signs of loss of vegetation or erosion due to vehicle movement during the construction of the two 500-kV lines showed very little impact resulted from these similar construction projects. The excellent network of access roads along the ROW will minimize any offroad vehicle travel.

Floodplains/Wetlands

As the proposed project is located in a desert area, surface water is nonexistent except for short periods after heavy rains and in manmade anomalies such as the Beardsley Canal. The cattail marsh near the dam will

not be affected by the proposed transmission line. Groundwater depths are measured in hundreds of feet, and thus will not be affected by the augered structure foundation.

The proposed project does cross one floodplain area in two locations as mapped by FEMA. This floodplain includes the river bed of the Agua Fria River located directly below the dam. Some structures will be located in the floodplain as the areas are too wide to span. A floodplains/wetlands assessment that covers this aspect in further detail can be found in the Appendix.

No floodplain-related problems have been observed during the 20 years the existing lines have been in place. No significant impacts to floodplains will result from the proposed project, nor will the presence of floodplains affect the construction, operation, and maintenance of the transmission line.

Biological Resources

Vegetation. Due to the nature of the proposed project, very little impact would occur to vegetation. Existing access is very good over most of the entire length of the project, having been developed for the construction and maintenance of the existing two lines. Except for the approximately three miles of new access road to be constructed, vehicular activity will be limited to these existing access roads. The new access roads will almost entirely be located in or adjacent to the designated borrow areas south of New Waddell Dam.

Wildlife. During the construction phase of the project, minor temporary disturbance to normal wildlife activity will occur in those areas where humans are present. This disturbance will cease in a given area as construction is completed and crews move down the line. Mobile species are expected to temporarily avoid the areas of construction activity. The overall level of disturbance will be further reduced by the nocturnal habits of many desert species; they would be active during the night, when construction would stop. Potential long-term impacts will be directly related to any vegetation or habitat alteration, which has been determined to be minor.

Raptor electrocution is not a concern with high voltage transmission lines. This is more of a problem with lower voltage subtransmission and distribution lines, where conductors may be closer to each other or a ground source. The design of the structures for the proposed transmission line exceeds the requirements suggested by the Raptor Research Foundation (Ollendorf et. al. 1980) for the protection of large birds of prey.

Protected Species and Species of Interest. Section 7(c) of the Endangered Species Act of 1973, as amended, requires all Federal agencies to consult with the FWS on potential for impacts to threatened or endangered species. The response from the FWS indicates that no listed species are known to exist in the area of the transmission line project. There are no proposed species, candidate category 1 species, or critical habitats in the study area (R. Miesta, USFWS, October 27, 1986, pers. com.).

It is Western's policy to consider State conservation agency concerns for possible impacts to State special status species. In Arizona, the Gila monster and desert tortoise are regarded as "endangered" special status species and are protected by State law. As part of the construction contract, the contractor will be required to remove unharmed from the construction area any individuals of these species.

The contractor will also be required to contact the Arizona Department of Horticulture and Agriculture 30 to 60 days in advance of construction in regards to plant species of State concern. The State may survey for and tag individual cacti for removal from construction areas, which will be a responsibility of the construction contractor.

Visual Resources

The two APS Navajo-Westwing 500-kV Transmission Lines have been a part of the existing landscape for over 20 years. While the construction of the proposed 230-kV line will result in additional lattice steel structures, the incremental change in the visual effect of the transmission lines would be small. Although it is a matter of personal perception, it is generally considered that two parallel transmission lines utilizing the same or similar structure design are less visually intrusive than two lines having different structure design. Single pole structures were also considered; it is felt that their use would result in a slight increase in visual impact as compared with lattice steel structures. Overall, the proposed project will not introduce significant new visual impacts to the landscape.

Land Ownership/Use

Land ownership will not be impacted by the proposed project. Most of the proposed project will be constructed in an existing transmission line corridor. The ROW and access are easements only, which allow the landowner to use the land for most purposes except for the building of permanent structures. Landowners will be compensated for these easements and any property damage that may occur as a result of construction.

Land use would not be significantly impacted by the proposed project. The great majority of the land through which the transmission line will pass is undeveloped open desert.

Socioeconomics

There would be no long-term socioeconomic impact to the project area. Some short-term gain for area retailers may result during the construction phase. The project is not large enough nor sufficiently long enough in duration to cause any strain on local resources or community services. The project would not impact the long-term local employment situation. Overall, the proposed project would not significantly affect the socioeconomics of the area on short- or long-term basis.

Cultural Resources

The proposed 230-kV transmission line would have no effect on known cultural resources. This region of Arizona has now been extensively surveyed for cultural resources. The corridor from Westwing Substation to the Agua Fria

River crossing was resurveyed at seven test pit locations on May 10, 1986 (Green 1986). No cultural sites were found. This survey confirmed the original survey conducted for the APS lines. Construction of the new transmission line will avoid all significant sites in the Agua Fria Borrow Area, which lies between the dam site and the east side of the Agua Fria River (ACS 1985, Green 1986). BuRec has consulted with the Arizona SHPO pursuant to 36 CFR 800.4(a) concerning the level of effort appropriate to adequately address cultural resources. The SHPO has concurred that no further work appears to be necessary for Section 106 compliance (Letter from Arizona SHPO to BuRec, Nov. 30, 1987). Should heretofore undiscovered cultural resources be located during construction, the construction contractor would be required to cease work in that location until the site can be properly evaluated and consultation with the SHPO undertaken.

Human Health and Electromagnetic Fields

Slight audible noise levels and measurable electromagnetic fields within the ROW are characteristic of an operating line. These levels will be within the ranges typical for high voltage transmission lines and will be similar to those generated by the existing APS lines. Noise and electromagnetic field levels would not be expected to be a human health concern due to the lack of residences or development in the vicinity of the proposed ROW. The operation of the new transmission line would not result in any significant environmental impacts.

VIII. CONSULTATION AND COORDINATION

The following agencies were contact during preparation of this environmental assessment:

1. U.S. Fish and Wildlife Service

2. Bureau of Land Management

3. Arizona State Historic Preservation Officer

4. Arizona Department of Water Resources

5. Maricopa County Flood Control District

6. Maricopa County Planning Department

7. U.S. Bureau of Reclamation

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APPENDIX

Floodplain/ Wetlands Assessment

Pursuant to the directives of the U.S. Department of Energy's "Compliance with Floodplains/Wetlands Environmental Review Requirements," 10 CFR 1022, Western has determined that the proposed action would involve crossing a floodplain created by the Agua Fria River. No wetlands would be affected by the proposed project. This floodplain assessment was prepared as a result of the determination of involvement. A Floodplains/Wetlands Notice was published in the FEDERAL REGISTER on November 18, 1987 (52 FR 44219). No comments were received in response to the notice.

The following sources were consulted in preparation of this assessment:

1. Flood Hazard Boundary Maps published by the National Flood Insurance Program of the Department of Housing and Urban Development were used to determine floodplain boundaries.

2. State and county floodplain management agencies were contacted for their concerns over the proposed project.

   a. The State of Arizona, Department of Water Resources had no concerns with Western's proposal.

   b. The Flood Control District of Maricopa County responded that the new line would have no apparent impact on Flood Control District projects or activities.

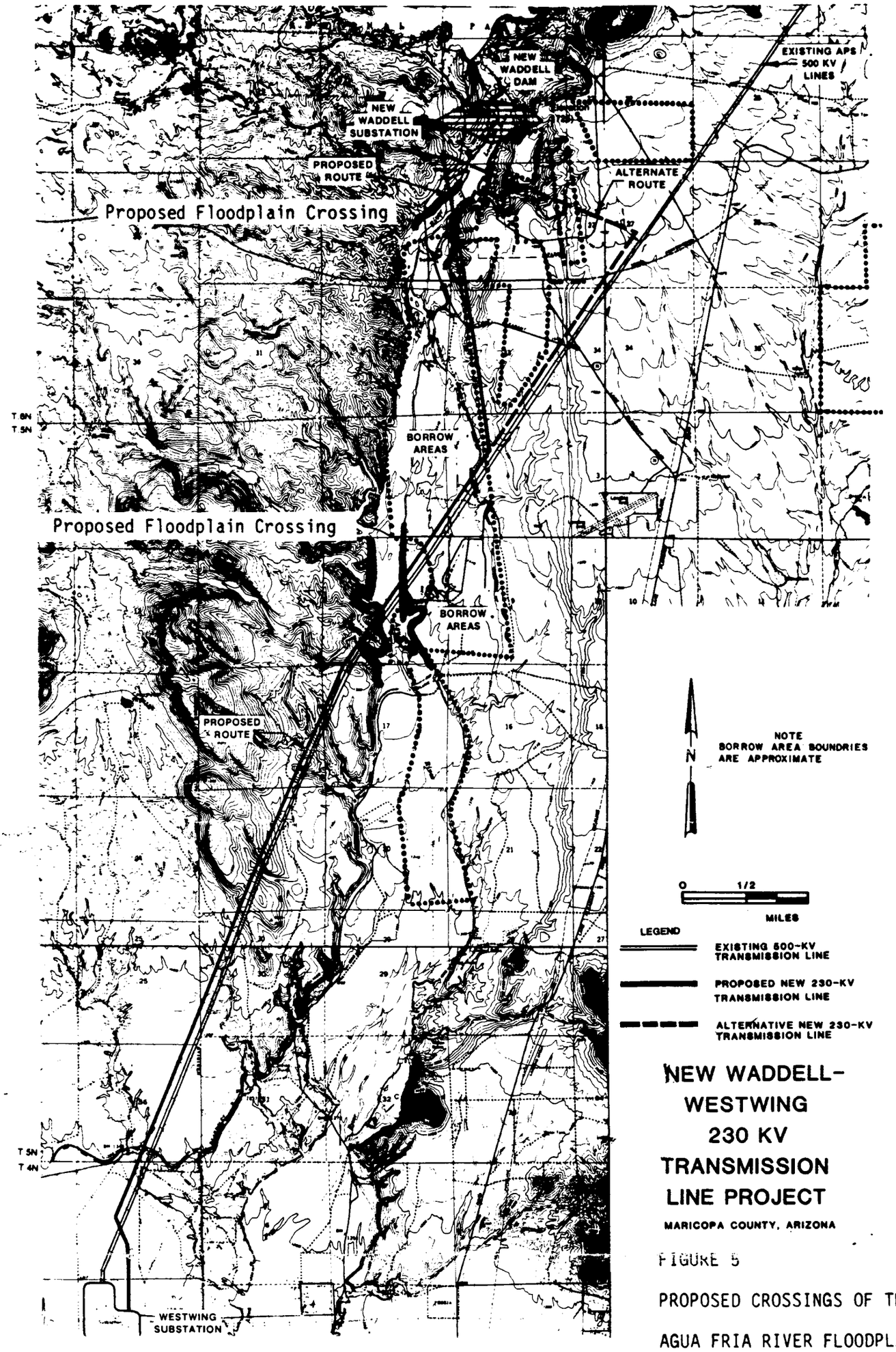
This project falls under the nationwide permit provisions of the U.S. Army Corps of Engineers for their permit requirements under section 404 of the Federal Water Pollution Control Act Amendments of 1972. Permits are not required for each individual project. Western will follow the requirements of the permit in crossing the floodplain.

The proposal will conform with State and Local floodplain protection standards.

Features of the proposed action are described under the Proposed Action section of this environmental assessment. A map of the proposed crossings of the floodplain is included in Figure 5.

Floodplain Impacts

Potential impacts from the proposed action are associated with the construction of the New Waddell-Westwing Transmission Line. Construction will



NEW WADDELL-WESTWING 230 KV TRANSMISSION LINE PROJECT

MARICOPA COUNTY, ARIZONA

FIGURE 5

PROPOSED CROSSINGS OF THE AGUA FRIA RIVER FLOODPLAIN

require vehicle operation in the floodplain areas. However, the well-developed system of access and ROW roads will allow these activities to take place with very little impact to the surrounding area.

Floodplain vegetation is important to wildlife, helps control erosion and stabilize banks, and retards runoff so that it can infiltrate into the soil. Since the river bed is basically the floodplain area, the existing ROW and access roads have; however, mostly been already cleared through these areas. Clearing of vegetation will be very limited.

Minor and insignificant increases in soil erosion could result from vegetation damage or disturbance to these areas. Surface water quality is very low when these channels are active, as the entire flow is composed of runoff. The slight increase in erosion that could be attributable to the proposed project would not significantly affect water quality.

In the event of flooding, the presence of the transmission line would not present a potential impact to human life and property. In most areas, there is no development near the transmission lines. Western's automatic line protection devices ensure that a sudden grounding of the line, such as a downed line due to flood, would cause the line to relay and deenergize. The structures themselves would not pose a significant obstruction to water flows during floods.

The Department of Energy intends to avoid to the extent practicable the long and short-term adverse impacts associated with modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.

A concern with locating transmission lines in floodplains is the potential for structures to wash out and cause the temporary loss of the line. This potential will be minimized by ensuring that a minimal number of structures will be located in the active channel. Since the floodplain crossings are below New Waddell Dam, it is assumed the dam would regulate any flooding from upstream. The existing lines have been in place for over 20 years without significant problems. If necessary, the new structures would be designed with stronger and deeper footings having four footings each which should minimize washouts.

Alternatives

Location of the Line

Due to the topography of the area, the proximity of the transmission line corridor, and the shortness of the new line, it is unrealistic from economic, practical, and environmental considerations to route the New Waddell-Westwing Transmission Line in any other location. Such an alternative would result in high levels of impact to the floodplain than would the proposed action, since

the line has been located in the least amount of floodplain area possible. Overall, environmental impacts associated with any other location of the line would be significantly greater than those associated with the proposed action.

Location of the Structures

Location of structures to areas outside the designated floodplain would be impractical. The floodplain is too wide to permit complete spanning. Structures will be sited as far as possible from the center of the active river channel. Therefore, possibly only one or two structures may have to be in the most active part of the floodplain.

No Action

Selection of the no-action alternative would avoid the minor impacts associated with construction activity. However, the positive aspects of no action are not great, and the benefits of the proposed action more than outweigh the minor impacts that would occur.

Proposed Action

Under the proposed action, certain measures could mitigate the impacts associated with construction activities.

1. If a structure should need to be located within the floodplain, adequate floodproofing measures such as deeper foundations would be included in the design, if necessary.

2. Construction activities in the main channel and on terraces and banks would be kept to a minimum. Unnecessary vehicular traffic in those areas would be avoided. Disturbed areas would be restored to original contours to minimize erosion.

3. Vegetation clearing would be minimized.

TABLE 1

State of Arizona Protected Groups of Plants

1. All species of the following families: Liliaceae (lily family), Amaryllidaceae (amarylls family), Orchidaceae (orchids), Crassulaceae (orpine family), Cactaceae (cactus family.)

2. All species of the following genera: Aquilegia (columbine), Lobelia (Lobelia), Dodecatheon (shooting star), Primula (primrose), Fouquieria (ocotillo).

3. The following species: Atriplex hymenelytra (desert holly), Cercis occidentalis Torr. (California redbud), Dalea spinosa (smoke tree), Holacantha emoryi (crucifixion thorn), Fremontia californica (flannel bush), Pinus aristata (bristlecone pine), Rhus kearneyi (Kearney sumac), Sapium biloculare (Mexican jumping bean), Sebastiana pavoniana (Mexican jumping bean).

4. The following species of live or dead plants or parts thereof: Prosopis juliflora (common mesquite), Prosopis pubescesn (screwball mesquite), Cercidium microphyllum (little leaf paloverde), Parkinsonia aculeatal (Jerusalem thorn, long leaf paloverde), Olneya tesota (ironwood tree).