

Application for a Certificate of Environmental Compatibility

Irvington to Kino 138 kilovolt Transmission Line Project

Prepared for:

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

Submitted by:

Tucson Electric Power Company

Date: April 25, 2018

Case No. 178

BEFORE THE
ARIZONA POWER PLANT AND TRANSMISSION LINE SITING COMMITTEE

In the matter of the Application of Tucson Electric Power Company, in conformance with the requirements of A.R.S. § 40-360, *et seq.*, for a Certificate of Environmental Compatibility authorizing the Irvington to Kino 138 kilovolt (kV) Transmission Line Project, which includes the construction of a new 138 kV transmission line and associated facilities originating at the Irvington Substation, Section 03, Township 15 South, Range 14 East, and terminating at the Kino Substation, Section 30, Township 14 South, Range 14 East, each located within Pima County, Arizona.

Docket No. _____

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APPLICATION FOR
CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY

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LIST OF ACRONYMS AND ABBREVIATIONS

3d	3-dimensional
A	Amperes
AAC	Arizona Administrative Code
ACE	Alternative Computerized Education
ACC	Arizona Corporation Commission
ADOT	Arizona Department of Transportation
AM	Amplitude modulation
AN	Audible noise
A.R.S.	Arizona Revised Statutes
ASM	Arizona State Museum
AZGFD	Arizona Game and Fish Department
BE	Biological Evaluation
CEC	Certificate of Environmental Compatibility
Committee	Arizona Power Plant and Transmission Line Siting Committee
dba	A-weighted decibels
DMAFB	Davis-Monthan Air Force Base
DOD	U.S. Department of Defense
E/C	Engineering/constructability
EMF	Electric and Magnetic Fields
EPNG	El Paso Natural Gas
°F	Degrees Fahrenheit
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
FM	Frequency modulation
GIS	Geographic Information System

HCP	Habitat Conservation Plan
HDMS	Heritage Data Management System
I-10	Interstate 10
IPaC	Information for Planning and Consultation
IRA	Important Riparian Area
KOP	Key Observation Point
kV	Kilovolts
LLNB	Lesser long-nosed bat
MBTA	Migratory Bird Treaty Act
NEPA	National Environmental Policy Act
NWP	Nationwide Permit
PPEP	Portable Practical Educational Preparation
Project	Irvington to Kino 138 kV Transmission Line Project
SDCP	Sonoran Desert Conservation Plan
SR	State Route
TEP	Tucson Electric Power Company
UPRR	Union Pacific Railroad
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
V	Volts

1.0 INTRODUCTION

Tucson Electric Power Company (TEP) requests that the Arizona Power Plant and Transmission Line Siting Committee (Committee) issue a Certificate of Environmental Compatibility (CEC) granting authority to construct the Irvington to Kino 138 kilovolt (kV) Transmission Line Project (Project).

The Project will provide increased capacity to serve future load increases, reduce the load on part of the aging existing 46 kV system serving the area, and provide increased reliability under contingency conditions. The existing 46 and 138 kV systems do not provide sufficient capacity to serve the new developing load, which includes a large mixed-use development in the vicinity of 36th Street and Kino Boulevard.

The Project will consist of new 138 kV transmission lines and structures totaling approximately 3.63 to 4.64 miles, depending on the route selected to connect the existing Irvington Substation to the future Kino Substation.¹ The Project will cross private and Pima County owned land, as well as City of Tucson and Pima County road rights-of-way. TEP is requesting a 300-foot corridor for the Preferred Route, to allow for siting flexibility.

The relief requested in this application balances, in the broad public interest, the need for an adequate, economical, and reliable supply of electric power, with the desire to minimize impacts on the environment and ecology of the State of Arizona. The Project will result in no adverse impacts on factors to be considered by the Committee including existing land use plans; fish, wildlife, and plant life; areas unique because of biological wealth; scenic areas, historic sites and structures and archaeological sites; and the total environment of the area. As such, TEP respectfully requests that the Committee grant, and the Arizona Corporation Committee (ACC) approve, the requested CEC for the Project.

¹ Approval to site Kino Substation at the southeast corner of East 36th Street and South Kino Parkway has been issued by the City of Tucson.

2.0 APPLICATION FOR CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY

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

2.1 Project Information

1. Name and address of Applicant:

Tucson Electric Power Company (TEP)
88 East Broadway Blvd, Tucson, AZ 85701
PO Box 711, Tucson, AZ 85702

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

Ed Beck
Director, Transmission Development
Tucson Electric Power
88 East Broadway Blvd, Tucson, AZ 85701
PO Box 711, Tucson, AZ 85702
Phone: (520) 884-3615

3. Dates on which Applicant filed a Ten-Year Plan in compliance with A.R.S. § 40-360.02, and designate each such filing in which the facilities for which this application is made were described. If they have not been previously described in a Ten-Year Plan, state the reasons therefore:

TEP's current "Ten-Year Plan Transmission Projects for Years 2018-2027," filed in January 2018 in Docket No. E-00000D-17-0001, includes this Project. The Project was identified as a Planned high-voltage Transmission Project (Irvington Substation – Future Kino 138 kV Substation). Previous Ten Year Plan filings (in which the Project was identified as Irvington Substation to Tucson Substation) that included the facilities described in this application were filed each year from 2011 through 2017.

4. Description of the proposed facilities:

a. Description of electric generating plant:

No electric generating plant is part of the Project.

b. Description of the proposed transmission line:

i. Nominal voltage for which the lines are designed:

138 kV alternating current, single circuit

ii. ***Description of the proposed structures:***

The transmission line will be constructed using tubular steel monopole structures. The structures are typically 75 to 110 feet above ground. Depending on the route selected, taller structures may be required for site specific clearance issues. The average span length between structures will be approximately 500 feet; departures from this span length may be necessary to achieve site specific mitigation objectives. The tubular steel pole structures will have a self-weathering finish, and the conductor will have a non-specular finish to reduce visibility.

See Exhibits G-1, G-2, for typical structures. See Exhibits G-5.1 to G-5.18 for visual simulations of the transmission line.

iii. ***Description of the proposed switchyards and substations:***

The Project originates at the Irvington 138 kV Substation, which will be upgraded and relocated on the existing Irvington Campus in 2019.

The Project terminates at the future Kino 138 kV Substation. Approval to site Kino Substation has been issued by the City of Tucson through a Minor Planned Area Development amendment.

See Exhibits G-3 and G-4 for substation layouts and Exhibit G-5.19 for a visual simulation of the future Kino Substation.

iv. ***Purpose for constructing said transmission line:***

The purpose of the Project is to meet growing load in the Tucson area in the vicinity of 36th Street and Kino Boulevard, alleviate the load on existing circuits, provide more reliability under contingency conditions, and provide 138 kV transmission capability between the Irvington Substation and the area to the north of Interstate 10 (I-10) between Country Club Road and Sixth Avenue. Existing transmission lines in the area cannot serve this purpose.

The Project and the future Kino Substation will provide TEP the capacity needed to serve future load increases as well as improve electrical system reliability within the Tucson metropolitan area. The area served by the Kino Substation is currently served by lower voltage (46 kV and below) distribution lines that do not provide sufficient capacity to serve the new developing load.

The Project will increase system reliability by providing a more robust 138 kV voltage, and allow reduction of the load on part of the aged existing 46 kV system serving the area. The Project will allow TEP to meet its obligation to provide reliable and affordable electrical power to customers within its service territory.

c. **General Location**

i. **Description of geographic points between which the transmission line will run:**

The proposed transmission line will run from the Irvington Substation, located at East Irvington Road and South Alvernon Way, to the future Kino Substation, to be located at South Kino Parkway and East 36th Street in Tucson, Arizona.

ii. **Straight-line distance between such geographic points**

The straight-line distance from the Irvington Substation to the future Kino Substation is approximately 3.5 miles.

iii. **Length of the transmission line for each alternate route:**

The distances between the two substations are shown in Table 1:

Table 1. Alternative Routes: Distances

Alternative	Distance (miles)
Alternative A	4.64
Alternative B	3.63
Alternative C	4.26

d. **Detailed Dimensions:**

i. **Nominal width of right-of-way required:**

The Applicant is requesting approval of a general corridor 300-feet wide to allow for siting flexibility. The Applicant plans to acquire, in areas not covered by existing franchise agreements, a 100-foot-wide right-of-way.

ii. **Nominal length of span:**

The nominal length of span is approximately 500 feet.

iii. **Typical height of supporting structures above ground:**

Supporting structures typically will range from 75 feet to 110 feet. For this project TEP does not anticipate any structures over 150 feet, but could reach up to 199 feet, subject to final design of Arizona Department of Transportation (ADOT) State Route (SR) 210 and I-10 projects.

iv. **Minimum height of conductor above ground:**

The minimum height of the 138 kV transmission line conductor above existing grade will be 25 feet.

e. **Estimated costs of the proposed transmission line and route:**

Estimates for the alternative routes are shown in Table 2. Variations in cost depend upon length of construction and quantity of materials required, as well as existing conflict mitigation and land easement acquisitions. Alternative A is the longest route, which reflects higher material and construction costs. The estimate for Alternative A also includes costs for undergrounding a conflicting distribution line along Irvington Road between Palo Verde Road to Country Club Road. Alternative B, while shorter in length, would require a new corridor in the segment north of I-10, adding significant land easement acquisition costs to the estimate. Alternative C has some additional costs associated with crossing existing transmission facilities, however, the greatest impact to the estimate is costs associated with mitigation of natural gas/petroleum lines along Ajo Way.

Table 2. Estimated Costs by Alternative

	Construction and Materials	Land Acquisition	Total Cost
Alternative A	\$ 4,400,000	\$ 716,135	\$ 5,116,135
Alternative B	\$ 4,300,000	\$ 2,334,406	\$ 6,634,406
Alternative C	\$ 4,600,000	\$ 319,375	\$ 4,919,375

f. **Description of proposed route and switchyard locations. (If application contains alternative routes, list routes in order of applicant's preference with a summary of reasons for such order of preference and any changes such alternative routes would require in the plans reflected in (i) through (iv) hereof):**

TEP identified a study area for analysis as the Project was being considered. TEP examined the study area to identify possible locations where the routes could be located, based on the following factors:

- biological wealth
- biological resources
- land use
- existing land rights
- existing plans
- visual impacts
- cultural resources
- engineering and operational feasibility
- construction, operation, and maintenance costs

Three alternative routes were identified within the study area for further assessment of their feasibility in siting the Project. The alternative routes, depicted in Exhibit A-3, were selected based on the objective of linking together the relevant substations and minimizing impacts through the use of existing infrastructure corridors. The alternative routes are distinguished by letters A through C.

Alternative A (Blue line) (Preferred)

Alternative Route A is an approximately 4.64-mile long route. This route uses existing road right-of-way along Irvington Road, Benson Highway, Park Avenue, and 36th Street. This alternative, depicted as a blue line on the map, would extend west along Irvington Road from TEP's Irvington Campus to Benson Highway. It would then turn northwest and continue along Park Avenue to 36th Street, where it would then turn east to the future Kino Substation at the southeast corner of Kino Parkway and 36th Street.

Alternative C (Orange line)

Alternative Route C is an approximately 4.26-mile long route. This route uses existing road right-of-way along Irvington Road, Palo Verde Road, Ajo Way and Campbell Avenue. This alternative, depicted as an orange line on the map, would extend west along Irvington Road from TEP's Irvington Campus to Palo Verde Road. Alternative C would then turn north and continue along Palo Verde Road to Ajo Way, where it would turn west and continue to the Kino Parkway off ramp. From this point, Alternative C would turn north and continue along the Kino Parkway off ramp and Campbell Avenue to 36th Street. Alternative C would then turn west to the future Kino Substation at the southeast corner of Kino Parkway and 36th Street.

Alternative B (Green line)

Alternative Route B is an approximately 3.63-mile long route. This route uses existing road right-of-way along Irvington Road and Campbell Avenue, as well as a new right-of-way north of I-10. This alternative, depicted as a green line on the map, would extend west along Irvington Road from TEP's Irvington Campus to Palo Verde Road. Alternative B would then turn northwest and continue on the north side of I-10 (outside of the Arizona Department of Transportation I-10 right-of-way, just west of the Kino Sports Park, the line would turn north, cross Ajo Way, and continue north along the Kino Parkway off ramp and Campbell Avenue to 36th Street. Alternative B would then turn west to the future Kino Substation at the southeast corner of Kino Parkway and 36th Street.

- g. For each alternative route for which application is made, list the ownership percentages of land traversed by the entire route (federal, state, Indian, private, etc.):***

Land ownership in the study area is private, City of Tucson, and Pima County. Table 3 indicates the jurisdiction relative to each route. The alternative routes would be located in existing road right-of-way, to the extent practical, utilizing TEP's existing franchise

agreements with Pima County and the City of Tucson, which allow for the transmission line to be located within County and City rights-of-way.

Table 3. Land Ownership

Alternative	City of Tucson	Pima County	Private
A	66%	23%	11%
B	30%	23%	47%
C	49%	51%	0%

5. **List the areas of jurisdiction [as defined in A.R.S. § 40-360(1)] affected by each alternative site or route and designate those proposed sites or routes, if any, which are contrary to the zoning ordinances or master plans of any of such areas of jurisdiction.**

All three alternatives are within the jurisdiction of Pima County and the City of Tucson, and all three are compatible with local land use plans and zoning.

6. **Describe any environmental studies applicant has performed or caused to be performed in connection with this application or intends to perform or cause to be performed in such connection, including the contemplated date of completion.**

TEP has conducted environmental studies, including field studies and impact assessments, to support this application. Information on these study efforts are contained in the following exhibits:

- Exhibit A Location and Land Use Maps
- Exhibit B Environmental Report
- Exhibit C Areas of Biological Wealth
- Exhibit D Biological Resources
- Exhibit E Scenic Areas, Historic Sites and Structures, and Archaeological Sites
- Exhibit F Recreational Purposes and Aspects
- Exhibit G Concepts of Proposed Facilities
- Exhibit H Existing Plans
- Exhibit I Anticipated Noise and Interference with Communication Signals
- Exhibit J Special Factors (Includes Public Involvement)

7. **Rationale for alternatives selection:**

Alternative A was selected as the preferred alternative because it has the highest score, 28/33, of the alternative routes in the “Irvington to Kino 138 kV Transmission Line Project Alternative Route

Development Report,” and has the least potential effect on the criteria considered in this analysis. This conclusion holds from a number of perspectives because Alternative A is rated equal to or higher than the other alternatives based on the 11 criteria. It scored six (6) “3’s” (no effect), five (5) “2’s” (moderate effect) and zero (0) “1’s” (major effect) on the criteria analyzed. Although Alternative A is 0.38 miles longer than Alternative C (the next highest scoring alternative), the cost of Alternative A is only estimated to be about \$200,000 more than the lowest cost option (Alternative C).

The next most-highly rated alternative is Alternative C, which scored lower than Alternative A under Criterion 3 – Residential development, 4 – Sensitive receptors, and 5 – Room for separation, and higher than Alternative A under Criterion 11 – Cost. Although Alternative C’s cost is lowest, impacts on adjacent residential use and sensitive receptors (two major concerns of the public) would be greater from both a visual resources perspective and perceived health concerns. Furthermore, Alternative C would likely require mitigation to resolve conflicts with three major petroleum pipelines along Ajo Way.

Despite these impacts and additional mitigation measures that may be required, Alternative C would be the second favored alternative because it scored second highest at 26/33 and costs the least to construct. Alternative B is the least favored as it scored the lowest at 20/33, would be the most difficult to construct and maintain, and would cost the most to construct.

Based on the results of this assessment, Alternative A has the fewest constraints and is, therefore, the preferred project.