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Transcript Exhibit(s)

Docket #(s): L-00000A-22-0102-00203

Arizona Corporation Commission
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Exhibit #: TEP-1, TEP-2, CHMN-1, CHMN-2, and AEPCO-1 through AEPCO-18

EXHIBIT TEP-1

TESTIMONY SUMMARY OF CHRIS LINDSEY

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Tucson Electric Power Company provides the following exhibit.

Testimony Summary of Chris Lindsey

Chris Lindsey is the Director of Transmission and Distribution Planning for Tucson Electric Power Company ("TEP"). In his current position, Mr. Lindsey supports all aspects of TEP's siting, permitting and approval processes for both electric transmission and distribution projects. He is responsible for direction and oversight for long & short-term planning as well as interconnection review and approvals for both the transmission and distribution systems.

Mr. Lindsey has over 15 years of experience in the power industry. Mr. Lindsey joined TEP in 2006 as a Distribution Planning Engineer and focused on distribution planning, engineering, and interconnections as an engineer and manager in the area for roughly 10 years. He then added responsibility in the transmission planning area with focus on T&D planning process improvements, compliance, and large-scale renewable integration. Mr. Lindsey has also supported many company initiatives related to the integration of new technologies as it relates to the distribution system. Mr. Lindsey holds a Bachelor of Science in Electrical Engineering from the University of Arizona. He is a registered Professional Electrical Engineer in the State of Arizona.

At the hearing, Mr. Lindsey will provide an overview of TEP and TEP's role in the proposed Project. He will describe the Project's purpose and benefits as well the need for Saguaro to Marana 115/138kV Project. Additionally, he will discuss the Projects origination and development, with a focus on the collaboration with AEPCO. Mr. Lindsey will present testimony regarding next steps for TEP. He will present most of his testimony using a power point presentation, which can be found as Exhibit TEP-2.

EXHIBIT TEP-2

WITNESS PRESENTATION OF CHRIS LINDSEY

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Tucson Electric Power Company provides the following exhibit.

Saguaro to Marana 115/138kV Transmission Line Project

Hearing on Application for
Certificate of Environmental Compatibility

June 6, 2022 – June 10, 2022

Introduction of Witness

Introduction of Witness

Witness

- Chris Lindsey, Director T&D Planning, Tucson Electric Power

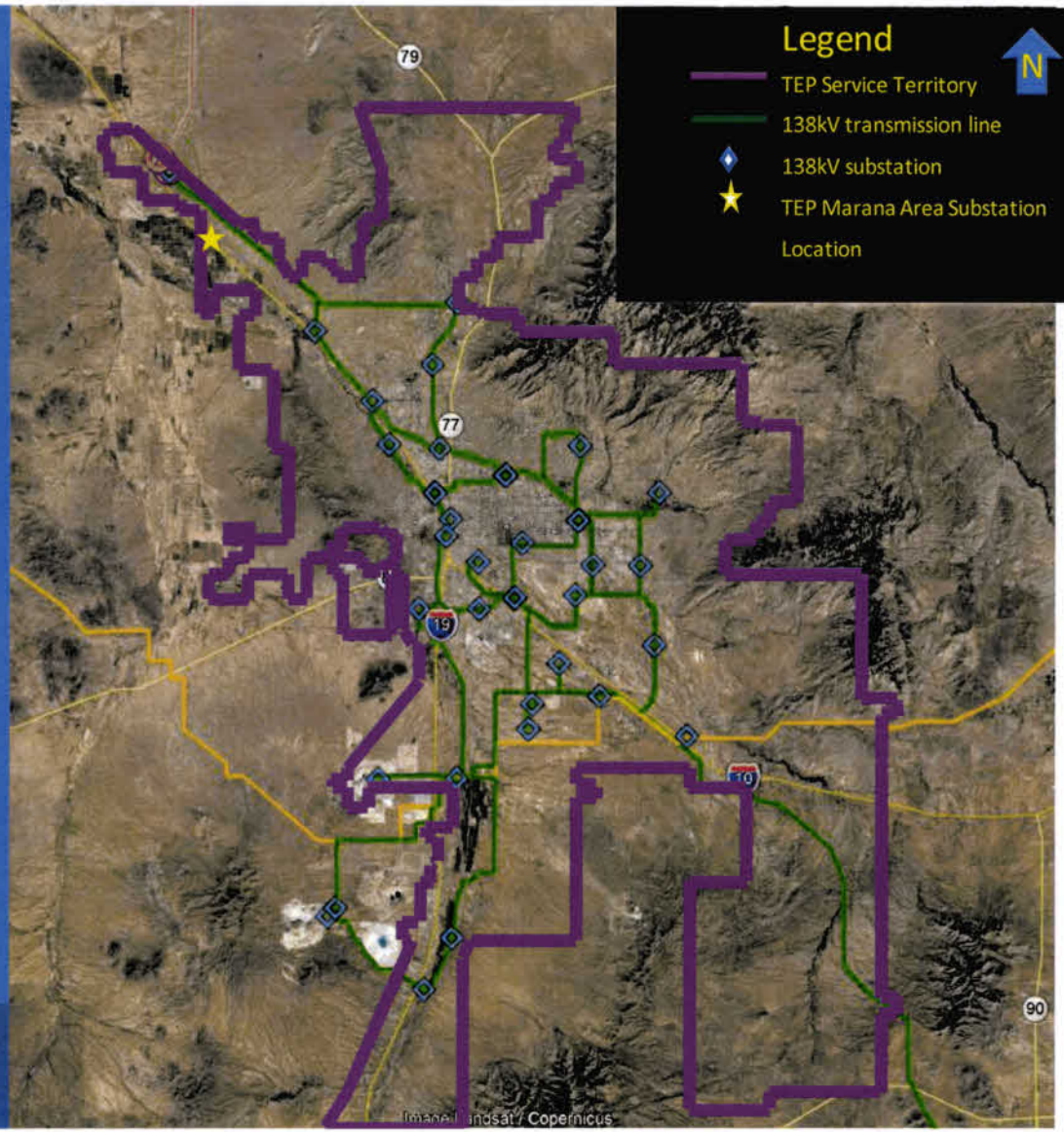
Education & Experience

- Bachelor of Science in Electrical Engineering, the University of Arizona, 2006
- Registered Professional Electrical Engineer, Arizona, 2010
- Director, T&D Planning, 2018 - Present
- Manager, Distribution Engineering & Technology, 2016 - 2018
- Manager, Energy Services, 2013 - 2016
- Energy Services Engineer, 2009 - 2013
- Distribution Planning Engineer, 2006 - 2009

Overview of Testimony

- Company Overview
- Project Purpose and Need
- Project Studies
- Opportunity to Partner with AEPCO
- Conclusion & Next Steps for TEP

Company Overview



- Service Territory of 1155 sq. miles
- 430 miles of 138kV overhead transmission lines
- 33 – 138kV substations
- Population served: over 1 million

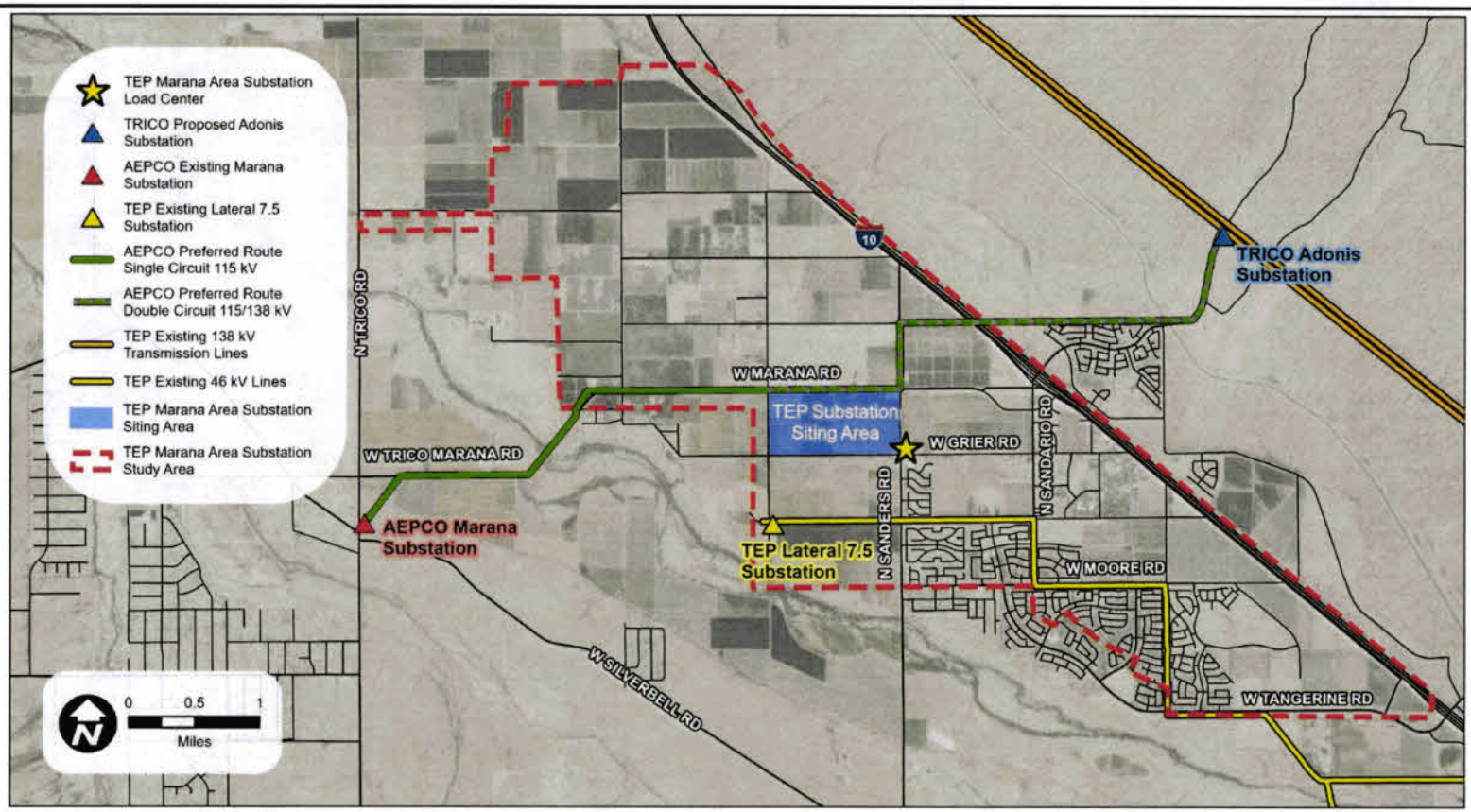
Project Purpose and Need

Project Purpose & Need

- New 138kV Marana area substation and looped transmission line will support existing and future customers
  - Improved reliability with looped source
  - Improved service voltage to customers
  - 138kV transmission line and substation will increase system capacity
    - Installing temporary mobile substation in the area in 2023 to support load growth until new 138kV substation and line can be built
  - Upgrades will support additional DG connections
  - Support for future utility-scale generation development

- Replacement of existing 46kV infrastructure
  - Marana area served by an aging, radial 46kV system
  - Existing Lateral 7.5 46kV substation and distribution feeders are at or near capacity
  - Aligns with long term plans to retire 46kV system in urban environments

Project Purpose & Need



Project Studies

Project Studies

- Need for a 138kV Marana area substation identified as far back as 2007
- Tortolita to Marana to North Loop 138kV line included in the Ten year Plan since 2007
- 2008 Load Saturation Study further identified the need for a 138kV substation in the Marana area
- 2018 Load Saturation Study confirmed need for a 138kV substation in the Marana area
- Area Study updated for Marana area in 2019 to identify load center and support land acquisition

Opportunity to Partner with AEPCO

Opportunity to Partner with AEPCO

- Double circuit transmission line between AEPCO Adonis and TEP area Marana substations reduces impact to Town of Marana and surrounding areas
  - Ultimate configuration will only require 2 transmission lines
  - Without partnership, 3 separate transmission lines would be needed
    - TEP needs to locate the transmission loop into Marana area sub on separate pole lines to maintain reliability
- Double circuit will reduce overall project costs for both AEPCO and TEP
- Partnership builds on past projects successes

Conclusions and Next Steps for TEP

Conclusions and Next Steps for TEP

Conclusions

- The project will improve reliability and capacity in the Marana area
- The project will support additional DG connections
- The project will support future utility-scale generation development
- Partnering with AEPCO will reduce overall cost and environmental impacts

Next Steps

- Finalize TEP Marana area substation location – purchase land
- Obtain CEC to complete 138kV loop from Marana area substation back to existing Tortolita to North Loop 138kV corridor
- Project in-service date 2025 - 2026

BEFORE THE ARIZONA POWER PLANT AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF ARIZONA ELECTRIC POWER COOPERATIVE, INC. OR ITS ASSIGNEES, IN CONFORMANCE WITHTHE REQUIREMENTS OF A.R.S. § 40-360 et. seq., FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING THE SAGUARO TO MARANA 115 KV TRANSMISSION LINE PROJECT.	Docket No. L-00000A-22-0102-00203 Case No. 203

CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY

A. Introduction

Pursuant to notice given as provided by law, the Arizona Power Plant and Transmission Line Siting Committee ("Committee") held public hearings in Marana, Arizona, on June 6, 2022 through June X, 2022 in conformance with the requirements of the Arizona Revised Statutes ("A.R.S.") § 40-360 *et seq.* for the purpose of receiving evidence and deliberating the Application for a Certificate of Environmental Compatibility (the "Application") filed by Arizona Electric Power Cooperative, Inc. ("AEPCO" or "Applicant") seeking approval to construct a 115/138 kilovolt ("kV") transmission line called the Saguaro to Marana 115/138 kV line ("Saguaro to Marana" or "the Project").

The following members and designees of members of the Committee were present at one or more of the hearing days for the evidentiary presentations, public comment and/or the deliberations:

Paul Katz	Chairman, Designee for Arizona Attorney General
Zachary Branum	Designee of the Chairman, Arizona Corporation Commission ("Commission")
Leonard Drago	Designee for Director, Arizona Department of Environmental Quality

David French	Designee for Director, Arizona Department of Water Resources
Rick Grinnell	Appointed Member, representing the counties
Mary Hamway	Appointed Member, representing cities and towns
James Palmer	Appointed Member, representing agriculture
Karl Gentles	Appointed Member, representing the general public
Jack Haenichen	Appointed Member, representing the general public
Margaret "Toby" Little	Appointed Member, representing the general public

The Applicant was represented by Meghan H. Grabel and Elias Ancharski of Osborn Maledon, P.A. The following party was granted intervention pursuant to A.R.S. § 40-360.05: [intervenor].

At the conclusion of the hearing, the Committee, after considering the (i) Application, (ii) evidence, testimony, and exhibits presented by AEPCO and interveners, and (iii) comments of the public, and being advised of the legal requirements of A.R.S. §§ 40-360 through 40-360.13, upon motion duly made and seconded, voted X to X in favor of granting AEPCO, its successors and assigns, this Certificate of Environmental Compatibility for the construction of the Project.

B. Overview Project Description

The Project will consist of the construction and operation of a new transmission line between the planned Trico Electric Cooperative Inc. ("Trico") Adonis Substation and the existing AEPCO Marana Substation near Marana, Arizona. The Project consists of two separate transmission line configurations. A general location map of the Project is set forth in **Exhibit A**. One portion of the Project is a double-circuit 115/138 kV transmission line to be jointly owned by AEPCO and Tucson Electric Power Company ("TEP") (the 115 kV circuit will be owned and operated by AEPCO, and the 138 kV circuit will be owned and operated by TEP); the other portion of the Project is a single-circuit transmission line owned and operated by

AEPCO alone. The transmission line originates at Trico's planned Adonis Substation. The location of the planned Adonis Substation enables AEPCO to connect to an existing transmission line, then interconnect to Arizona Public Service Company's ("APS") existing Saguaro Substation located approximately seven miles northwest of the planned Adonis Substation. In the future, TEP will connect its 138 kV circuit to TEP's existing 138 kV Quad Circuit adjacent to the planned Adonis Substation. The proposed double-circuit 115/138 kV transmission line would proceed west approximately four miles crossing Interstate 10, continuing to the intersection of Marana Road and Wentz Road. At the intersection of Marana Road and Wentz Road, the 138 kV line will be terminated for future use by TEP once a new substation location has been definitively located. From the intersection of Marana Road and Wentz Road, the line will proceed another four miles as a single circuit 115 kV transmission line to the existing AEPCO Marana Substation.

CONDITIONS

This Certificate is granted upon the following conditions:

1. This authorization to construct the Project shall expire ten (10) years from the date this Certificate is approved by the Commission, with or without modification. Construction of the Project shall be complete, such that the Project is in-service within this ten-year timeframe. However, prior to the expiration of the time period, the Applicant may request that the Commission extend the time limitation. ~~[CEC 196, 198]~~

2. In the event the Project requires an extension of the term(s) of this Certificate prior to completion of construction, the Applicant shall file such time extension request at least one hundred eighty (180) days prior to the expiration date of the Certificate. The Applicant shall use reasonable means to promptly notify the Board of Supervisors of Pima County, Arizona State Land Department ("ASLD"), and all cities and towns within a five (5) mile radius of the Project and all landowners

and residents within a five (5) mile radius of the Project, all persons who made public comment at this proceeding who provided a mailing or email address, and all parties to this proceeding. The notification provided will include the request and the date, time, and place of the hearing or open meetings during which the Commission will consider the request for extension. Notification shall be no more than three (3) business days after the Applicant is made aware of the hearing date or the open meeting date. ~~[CEC 196, 198]~~

3. During the development, construction, operation, maintenance and reclamation of the Project, the Applicant shall comply with all existing applicable air and water pollution control standards and regulations, and with all existing applicable statutes, ordinances, master plans and regulations of any governmental entity having jurisdiction including, but not limited to, the United States of America, the State of Arizona, Pima County, and their agencies and subdivisions, including but not limited to the following:

a. All applicable land use regulations;

b. All applicable zoning stipulations and conditions including, but not limited to, landscaping and dust control requirements;

c. All applicable water use, discharge and/or disposal requirements of the Arizona Department of Water Resources and the Arizona Department of Environmental Quality;

d. All applicable noise control standards; and

e. All applicable regulations governing storage and handling of hazardous chemicals and petroleum products. ~~[CEC 196, 198]~~

4. The Applicant shall obtain all approvals and permits necessary to construct, own, operate, and maintain the Project required by any governmental entity having jurisdiction including, but not limited to, the United States of America, the State, Pima County, and their agencies and subdivisions. ~~[CEC 196, 198]~~

5. The Applicant shall comply with the Arizona Game and Fish Department ("AGFD") guidelines for handling protected animal species, should any be encountered during construction and operation of the Project, and shall consult with AGFD or U.S. Fish and Wildlife Service, as appropriate, on other issues concerning wildlife. ~~[CEC 196, 198]~~

6. The Applicant shall design the Project to incorporate reasonable measures to minimize electrocution of and impacts to avian species in accordance with the Applicant's avian protection program. Such measures will be accomplished through incorporation of Avian Power Line Interaction Committee guidelines set forth in the current versions of *Suggested Practices for Avian Protection on Power Lines and Reducing Avian Collisions with Power Lines manuals*. ~~[CEC 196, 198]~~

7. The Applicant shall consult the State Historic Preservation Office ("SHPO") with respect to cultural resources. If any archaeological, paleontological, or historical site or a significant cultural object is discovered on state, county or municipal land during the construction or operation of the Project, the Applicant or its representative in charge shall promptly report the discovery to the Director of the Arizona State Museum ("ASM"), and in consultation with the Director, shall immediately take all reasonable steps to secure and maintain the preservation of the discovery as required by A.R.S. § 41-844. ~~[CEC 196, 198]~~

8. The Applicant shall comply with the notice and salvage requirements of the Arizona Native Plant Law (A.R.S. §§ 3-901 *et seq.*) and shall, to the extent feasible, minimize the destruction of native plants during the construction and operation of the Project. ~~[CEC 196, 198]~~

9. The Applicant shall make every reasonable effort to promptly investigate, identify and correct, on a case-specific basis, all complaints of interference with radio or television signals from operation of the Project addressed in this Certificate and where such interference is caused by the Project take reasonable

measures to mitigate such interference. The Applicant shall maintain written records for a period of five (5) years of all complaints of radio or television interference attributable to operations, together with the corrective action taken in response to each complaint. All complaints shall be recorded to include notation on the corrective action taken. Complaints not leading to a specific action or for which there was no resolution shall be noted and explained. Upon request, the written records shall be provided to the Staff of the Commission. The Applicant shall respond to complaints and implement appropriate mitigation measures. In addition, the Project shall be evaluated on a regular basis so that damaged insulators or other line materials that could cause interference are repaired or replaced in a timely manner. ~~[CEC 196, 198]~~

10. If human remains and/or funerary objects are encountered during the course of any ground-disturbing activities related to the construction or maintenance of the Project, the Applicant shall cease work on the affected area of the Project and notify the Director of the ASM as required by A.R.S. § 41-865 for private land, or as required by A.R.S. § 41-844 for state, county, or municipal lands. ~~[CEC 196, 198]~~

11. Within one hundred twenty (120) days of the Commission's decision approving this Certificate, the Applicant shall post signs in or near public rights-of-way, to the extent authorized by law, reasonably adjacent to the Project giving notice of the Project. Such signage shall be no smaller than a roadway sign. The signs shall advise:

a. Future site of the Project;

b. A phone number and website for public information regarding the Project; and

c. Refer the Public to the Docket https://edocket.azcc.gov/Search/Docket-Search.

Such signs shall be inspected at least once annually and, if necessary, be repaired or replaced, and removed at the completion of construction.

The Applicant shall make every reasonable effort to communicate the decision either approving or disapproving the Certificate in digital media. ~~[CEC 196, 198]~~

12. Upon the approval of this Certificate by the Committee, the Applicant shall provide cities and towns within five (5) miles of the Project, the Board of Supervisors for Pima County, and known builders and developers who are building upon or developing land within one (1) mile of the centerline of the Project with a written description, including the approximate height and width measurements of all structure types, of the Project. The written description shall identify the location of the Project and contain a pictorial depiction of the facilities being constructed. The Applicant shall also encourage the developers and builders to include this information in their disclosure statements. Upon approval of this Certificate by the Commission, the Applicant may commence construction of the Project. ~~[CEC 196, 198]~~

13. The Applicant shall use non-specular conductors and non-reflective surfaces for the transmission line structures on the Project. ~~[CEC 196, 198]~~

14. The Applicant shall be responsible for arranging that all field personnel involved in the Project receive training as to proper ingress, egress, and on-site working protocol for environmentally sensitive areas and activities. Contractors employing such field personnel shall maintain records documenting that the personnel have received such training. ~~[CEC 196, 198]~~

15. The Applicant shall follow the most current Western Electricity Coordinating Council ("WECC") and North American Electric Reliability Corporation ("NERC") planning standards, as approved by the Federal Energy Regulatory Commission ("FERC"), National Electrical Safety Code ("NESC") standards and Federal Aviation Administration ("FAA") regulations. ~~[CEC 196, 198]~~

16. The Applicant shall participate in good faith in state and regional transmission study forums to coordinate transmission expansion plans related to the Project and to resolve transmission constraints in a timely manner. ~~[CEC 196, 198]~~

17. When Project facilities are located parallel to and within one hundred (100) feet of any existing natural gas or hazardous liquid pipeline, the Applicant shall:

a. Ensure grounding and cathodic protection studies are performed to show that the Project's location parallel to and within one hundred (100) feet of such pipeline results in no material adverse impacts to the pipeline or to public safety when both the pipeline and the Project are in operation. The Applicant shall take appropriate steps to ensure that any material adverse impacts are mitigated. The Applicant shall provide to Staff of the Commission, and file with Docket Control, a copy of the studies performed and additional mitigation, if any, that was implemented as part of its annual compliance-certification letter; and

b. Ensure that studies are performed simulating an outage of the Project that may be caused by the collocation of the Project parallel to and within one hundred (100) feet of the existing natural gas or hazardous liquid pipeline. The studies should either: (a) show that such simulated outage does not result in customer outages, or (b) include operating plans to minimize any resulting customer outages. The Applicant shall provide a copy of the study results to Staff of the Commission and file them with Docket Control as part of the Applicant's annual compliance certification letter. ~~[CEC 196, 198]~~

18. The Applicant shall submit a compliance certification letter annually, identifying progress made with respect to each condition contained in this Certificate, including which conditions have been met. The letter shall be submitted to Commission's Docket Control commencing on December l, 2022. Attached to each certification letter shall be documentation explaining how compliance with each condition was achieved. Copies of each letter, along with the corresponding

documentation, shall be submitted to the Arizona Attorney General's Office. With respect to the Project, the requirement for the compliance letter shall expire on the date the Project is placed into operation. Notification of such filing with Docket Control shall be made to the Board of Supervisors for Pima County, all parties to this Docket, and all parties who made a limited appearance in this Docket. ~~[CEC 196, 198]~~

19. The Applicant shall provide a copy of this Certificate to the Board of Supervisors for Pima County and ASLD. ~~[CEC 196, 198]~~

20. Any transfer or assignment of this Certificate shall require the assignee or successor to assume, in writing, all responsibilities of the Applicant listed in this Certificate and its conditions as required by A.R.S. § 40-360.08(A) and R14-3-213(F) of the Arizona Administrative Code. ~~[CEC 196, 198]~~

21. In the event the Applicant, its assignee, or successor, seeks to modify the Certificate terms at the Commission, it shall provide copies of such request to the Board of Supervisors for Pima County, all parties to this Docket, and all parties who made a limited appearance in this Docket. ~~[CEC 196, 198]~~

22. The Certificate Conditions shall be binding on the Applicant, its successors, assignee(s), and transferees and any affiliates, agents, or lessees of the Applicant who have a contractual relationship with the Applicant concerning the construction, operation, maintenance, or reclamation of the Project. The Applicant shall provide in any agreement(s) or lease(s) pertaining to the Project that the contracting parties and/or lessee(s) shall be responsible for compliance with the Conditions set forth herein, and the Applicant's responsibilities with respect to compliance with such Conditions shall not cease or be abated by reason of the fact that the Applicant is not in control of or responsible for operation and maintenance of the Project facilities. ~~[CEC 196, 198]~~

23. The Applicant shall provide the Commission Staff with copies of the interconnection agreement(s) it ultimately enters into with any transmission provider(s) in Arizona with whom it is interconnecting with thirty (30) days of execution of such agreement(s), with the summary thereof filed at Docket Control, prior to construction of such facilities. ~~[CEC 196]~~

~~[CEC 198]~~

FINDINGS OF FACT AND CONCLUSIONS OF LAW

This Certificate incorporates the following Findings of Fact and Conclusions of Law:

1. The Project aids the state and the southwest region of the United States in meeting the need for an adequate, economical, and reliable supply of electric power.

2. The Project aids the state, preserving a safe and reliable electric transmissions system.

3. During the course of the hearing, the Committee considered evidence on the environmental compatibility of the Project as required by A.R.S. § 40-360 *et seq*.

4. The Project and the conditions placed on the Project in this Certificate effectively minimize the impact of the Project on the environment and ecology of the state.

5. The conditions placed on the Project of this Certificate resolve matters concerning balancing the need for the Project with its impact on the environment and ecology of the state arising during the course of the proceedings, and, as such, serve as finding and conclusions on such matters.

6. The Project is in the public interest because the Project's contribution to meeting the need for an adequate, economical and reliable supply of electric power outweighs the minimized impact of the Project on the environment and ecology of the state.

DATED this _____ day of June, 2022.

THE ARIZONA POWER PLANT AND
TRANSMISSION LINE SITING COMMITTEE

By: _____
Paul A. Katz, Chairman

BEFORE THE ARIZONA POWER PLANT AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF ARIZONA ELECTRIC POWER COOPERATIVE, INC. OR ITS ASSIGNEES, IN CONFORMANCE WITH THE REQUIREMENTS OF A.R.S. § 40-360 et. seq., FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING THE SAGUARO TO MARANA 115 KV TRANSMISSION LINE PROJECT.	Docket No. L-00000A-22-0102-00203 Case No. 203

CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY

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The following members and designees of members of the Committee were present at one or more of the hearing days for the evidentiary presentations, public comment and/or the deliberations:

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~~Zachary Branum~~	~~Designee of the Chairman, Arizona Corporation Commission ("Commission")~~
~~Leonard Drago~~	~~Designee for Director, Arizona Department of Environmental Quality~~

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James Palmer	Appointed Member, representing agriculture
~~Karl Gentles~~	~~Appointed Member, representing the general public~~
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Margaret "Toby" Little	Appointed Member, representing the general public

The Applicant was represented by Meghan H. Grabel and Elias Ancharski of Osborn Maledon, P.A. The following party was granted intervention pursuant to A.R.S. § 40-360.05: ~~[intervenor]~~Tucson Electric Power Company ("TEP"), represented by Meghan H. Grabel and Elias Ancharski of Osborn Maledon, P.A.

At the conclusion of the hearing, the Committee, after considering the (i) Application, (ii) evidence, testimony, and exhibits presented by AEPCO and interveners, and (iii) comments of the public, and being advised of the legal requirements of A.R.S. §§ 40-360 through 40-360.13, upon motion duly made and seconded, voted 7~~X~~ to 0~~X~~ in favor of granting AEPCO, its successors and assigns, this Certificate of Environmental Compatibility for the construction of the Project.

B. Overview Project Description

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other portion of the Project is a single-circuit transmission line owned and operated by AEPCO alone. The transmission line originates at Trico's planned Adonis Substation. The location of the planned Adonis Substation enables AEPCO to connect to an existing transmission line, then interconnect to Arizona Public Service Company's ("APS") existing Saguaro Substation located approximately seven miles northwest of the planned Adonis Substation. In the future, TEP will connect its 138 kV circuit to TEP's existing 138 kV Quad Circuit adjacent to the planned Adonis Substation. The proposed double-circuit 115/138 kV transmission line would proceed west approximately four miles crossing Interstate 10, continuing to the intersection of Marana Road and Wentz Road. At the intersection of Marana Road and Wentz Road, the 138 kV line will be terminated for future use by TEP once a new substation location has been definitively located. From the intersection of Marana Road and Wentz Road, the line will proceed another four miles as a single circuit 115 kV transmission line to the existing AEPCO Marana Substation.

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and all cities and towns within a ~~five~~ one (1~~5~~) mile radius of the Project and all landowners and residents within a ~~fone~~~~ive~~ (1~~5~~) mile radius of the Project, all persons who made public comment at this proceeding who provided a mailing or email address, and all parties to this proceeding. The notification provided will include the request and the date, time, and place of the hearing or open meetings during which the Commission will consider the request for extension. Notification shall be no more than three (3) business days after the Applicant is made aware of the hearing date or the open meeting date. ~~[CEC 196, 198]~~

3. During the development, construction, operation, maintenance and reclamation of the Project, the Applicant shall comply with all existing applicable air and water pollution control standards and regulations, and with all existing applicable statutes, ordinances, master plans and regulations of any governmental entity having jurisdiction including, but not limited to, the United States of America, the State of Arizona, Pima County, and their agencies and subdivisions, including but not limited to the following:

a. All applicable land use regulations;

b. All applicable zoning stipulations and conditions including, but not limited to, landscaping and dust control requirements;

c. All applicable water use, discharge and/or disposal requirements of the Arizona Department of Water Resources and the Arizona Department of Environmental Quality;

d. All applicable noise control standards; and

e. All applicable regulations governing storage and handling of hazardous chemicals and petroleum products. ~~[CEC 196, 198]~~

4. The Applicant shall obtain all approvals and permits necessary to construct, own, operate, and maintain the Project required by any governmental entity

having jurisdiction including, but not limited to, the United States of America, the State, Pima County, and their agencies and subdivisions. ~~[CEC 196, 198]~~

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7. The Applicant shall consult the State Historic Preservation Office ("SHPO") with respect to cultural resources. If any archaeological, paleontological, or historical site or a significant cultural object is discovered on state, county or municipal land during the construction or operation of the Project, the Applicant or its representative in charge shall promptly report the discovery to the Director of the Arizona State Museum ("ASM"), and in consultation with the Director, shall immediately take all reasonable steps to secure and maintain the preservation of the discovery as required by A.R.S. § 41-844. ~~[CEC 196, 198]~~

8. The Applicant shall comply with the notice and salvage requirements of the Arizona Native Plant Law (A.R.S. §§ 3-901 *et seq.*) and shall, to the extent feasible, minimize the destruction of native plants during the construction and operation of the Project. ~~[CEC 196, 198]~~

9. The Applicant shall make every reasonable effort to promptly investigate, identify and correct, on a case-specific basis, all complaints of

interference with radio or television signals from operation of the Project addressed in this Certificate and where such interference is caused by the Project take reasonable measures to mitigate such interference. The Applicant shall maintain written records for a period of five (5) years of all complaints of radio or television interference attributable to operations, together with the corrective action taken in response to each complaint. All complaints shall be recorded to include notation on the corrective action taken. Complaints not leading to a specific action or for which there was no resolution shall be noted and explained. Upon request, the written records shall be provided to the Staff of the Commission. The Applicant shall respond to complaints and implement appropriate mitigation measures. In addition, the Project shall be evaluated on a regular basis so that damaged insulators or other line materials that could cause interference are repaired or replaced in a timely manner. ~~[CEC 196, 198]~~

10. If human remains and/or funerary objects are encountered during the course of any ground-disturbing activities related to the construction or maintenance of the Project, the Applicant shall cease work on the affected area of the Project and notify the Director of the ASM as required by A.R.S. § 41-865 for private land, or as required by A.R.S. § 41-844 for state, county, or municipal lands. ~~[CEC 196, 198]~~

11. Within one hundred twenty (120) days of the Commission's decision approving this Certificate, the Applicant shall post signs in or near public rights-of-way, to the extent authorized by law, reasonably adjacent to the Project giving notice of the Project. Such signage shall be no smaller than a roadway sign. The signs shall advise:

a. Future site of the Project;

b. A phone number and website for public information regarding the Project; and

c. Refer the Public to the Docket https://edocket.azcc.gov/Search/Docket-Search.

Such signs shall be inspected at least once annually and, if necessary, be repaired or replaced, and removed at the completion of construction.

The Applicant shall make every reasonable effort to communicate the decision either approving or disapproving the Certificate in digital media. ~~[CEC 196, 198]~~

12. Upon the approval of this Certificate by the Committee, the Applicant shall provide cities and towns within five (5) miles of the Project, the Board of Supervisors for Pima County, and known builders and developers who are building upon or developing land within one (1) mile of the centerline of the Project with a written description, including the approximate height and width measurements of all structure types, of the Project. The written description shall identify the location of the Project and contain a pictorial depiction of the facilities being constructed. The Applicant shall also encourage the developers and builders to include this information in their disclosure statements. Upon approval of this Certificate by the Commission, the Applicant may commence construction of the Project. ~~[CEC 196, 198]~~

13. The Applicant shall use non-specular conductors and non-reflective surfaces for the transmission line structures on the Project. ~~[CEC 196, 198]~~

14. The Applicant shall be responsible for arranging that all field personnel involved in the Project receive training as to proper ingress, egress, and on-site working protocol for environmentally sensitive areas and activities. Contractors employing such field personnel shall maintain records documenting that the personnel have received such training. ~~[CEC 196, 198]~~

15. The Applicant shall follow the most current Western Electricity Coordinating Council ("WECC") and North American Electric Reliability Corporation ("NERC") planning standards, as approved by the Federal Energy Regulatory Commission ("FERC"), National Electrical Safety Code ("NESC") standards and Federal Aviation Administration ("FAA") regulations. ~~[CEC 196, 198]~~

16. The Applicant shall participate in good faith in state and regional transmission study forums to coordinate transmission expansion plans related to the Project and to resolve transmission constraints in a timely manner. ~~[CEC 196, 198]~~

17. When Project facilities are located parallel to and within one hundred (100) feet of any existing natural gas or hazardous liquid pipeline, the Applicant shall:

a. Ensure grounding and cathodic protection studies are performed to show that the Project's location parallel to and within one hundred (100) feet of such pipeline results in no material adverse impacts to the pipeline or to public safety when both the pipeline and the Project are in operation. The Applicant shall take appropriate steps to ensure that any material adverse impacts are mitigated. The Applicant shall provide to Staff of the Commission, and file with Docket Control, a copy of the studies performed and additional mitigation, if any, that was implemented as part of its annual compliance-certification letter; and

b. Ensure that studies are performed simulating an outage of the Project that may be caused by the collocation of the Project parallel to and within one hundred (100) feet of the existing natural gas or hazardous liquid pipeline. The studies should either: (a) show that such simulated outage does not result in customer outages, or (b) include operating plans to minimize any resulting customer outages. The Applicant shall provide a copy of the study results to Staff of the Commission and file them with Docket Control as part of the Applicant's annual compliance certification letter. ~~[CEC 196, 198]~~

18. The Applicant shall submit a compliance certification letter annually, identifying progress made with respect to each condition contained in this Certificate, including which conditions have been met. The letter shall be submitted to

Commission's Docket Control commencing on December 1, 2022. Attached to each certification letter shall be documentation explaining how compliance with each condition was achieved. Copies of each letter, along with the corresponding documentation, shall be submitted to the Arizona Attorney General's Office. With respect to the Project, the requirement for the compliance letter shall expire on the date the Project is placed into operation. Notification of such filing with Docket Control shall be made to the Board of Supervisors for Pima County, all parties to this Docket, and all parties who made a limited appearance in this Docket. ~~[CEC 196, 198]~~

19. The Applicant shall provide a copy of this Certificate to the Board of Supervisors for Pima County and ASLD. ~~[CEC 196, 198]~~

20. Any transfer or assignment of this Certificate shall require the assignee or successor to assume, in writing, all responsibilities of the Applicant listed in this Certificate and its conditions as required by A.R.S. § 40-360.08(A) and R14-3-213(F) of the Arizona Administrative Code. ~~[CEC 196, 198]~~

21. In the event the Applicant, its assignee, or successor, seeks to modify the Certificate terms at the Commission, it shall provide copies of such request to the Board of Supervisors for Pima County, all parties to this Docket, and all parties who made a limited appearance in this Docket. ~~[CEC 196, 198]~~

22. The Certificate Conditions shall be binding on the Applicant, its successors, assignee(s), and transferees and any affiliates, agents, or lessees of the Applicant who have a contractual relationship with the Applicant concerning the construction, operation, maintenance, or reclamation of the Project. The Applicant shall provide in any agreement(s) or lease(s) pertaining to the Project that the contracting parties and/or lessee(s) shall be responsible for compliance with the Conditions set forth herein, and the Applicant's responsibilities with respect to compliance with such Conditions shall not cease or be abated by reason of the fact

that the Applicant is not in control of or responsible for operation and maintenance of the Project facilities. ~~[CEC 196, 198]~~

23. The Applicant shall provide the Commission Staff with copies of the interconnection agreement(s) it ultimately enters into with any transmission provider(s) in Arizona with whom it is interconnecting with thirty (30) days of execution of such agreement(s), with the summary thereof filed at Docket Control, prior to construction of such facilities. ~~[CEC 196]~~

~~[CEC 198]~~

FINDINGS OF FACT AND CONCLUSIONS OF LAW

This Certificate incorporates the following Findings of Fact and Conclusions of Law:

1. The Project aids the state and the southwest region of the United States in meeting the need for an adequate, economical, and reliable supply of electric power.

2. The Project aids the state, preserving a safe and reliable electric transmissions system.

3. During the course of the hearing, the Committee considered evidence on the environmental compatibility of the Project as required by A.R.S. § 40-360 *et seq*.

4. The Project and the conditions placed on the Project in this Certificate effectively minimize the impact of the Project on the environment and ecology of the state.

5. The conditions placed on the Project of this Certificate resolve matters concerning balancing the need for the Project with its impact on the environment and ecology of the state arising during the course of the proceedings, and, as such, serve as finding and conclusions on such matters.

6. The Project is in the public interest because the Project's contribution to meeting the need for an adequate, economical and reliable supply of electric power

outweighs the minimized impact of the Project on the environment and ecology of the state.

DATED this _____ day of June, 2022.

THE ARIZONA POWER PLANT AND
TRANSMISSION LINE SITING COMMITTEE

By: _____
Paul A. Katz, Chairman

Application for a Certificate of Environmental Compatibility

Saguaro to Marana 115/138kV Transmission Line Project

Prepared for:

Arizona Power Plant and Transmission Line Siting Committee

Submitted by:

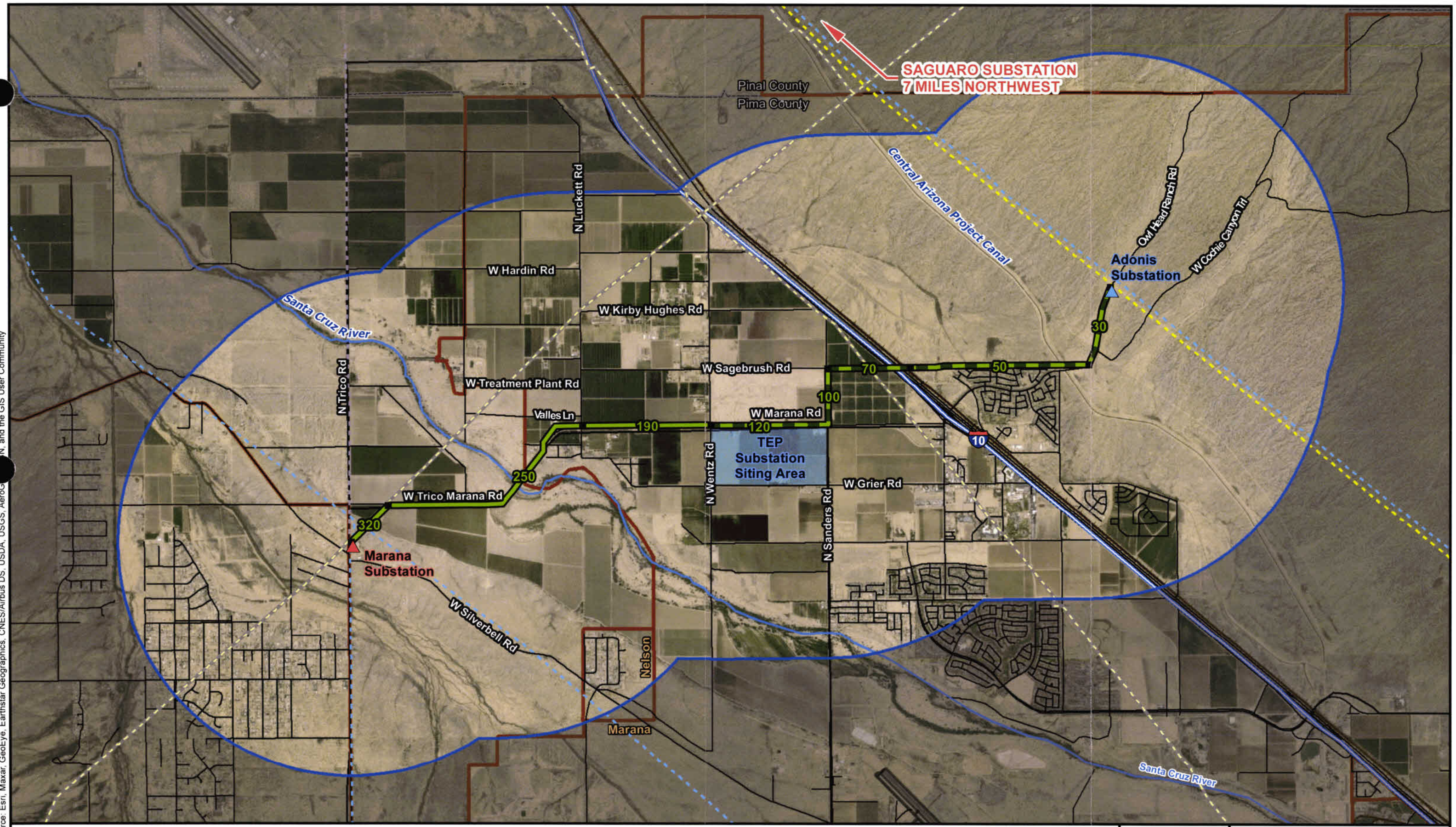
Arizona Electric Power Cooperative, Inc.

EXHIBIT AEPCO-2

MAP OF PROPOSED PROJECT

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibit.



Reference Features
- Study Area
- Interstate
- Major Roads
- Local Road
- Railroad
- County Boundary
- Municipal Boundary

Utilities
- Existing Substation
- Proposed Substation
- Existing Pipeline

Existing Transmission Lines
- Existing 138kV Transmission Line
- Existing 115kV Transmission Line
- Existing 24.9kV Distribution Line

Proposed Route
- Proposed Route Single Circuit 115kV
- Proposed Route Double Circuit 115/138kV
- Route Link Node
- 100 Route Link Number

NORTH

4,000 2,000 0 4,000

Scale in Feet

1 inch = 4,000 feet When Plotted at 11x17 1:48,000

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BURNS McDONNELL

Proposed Route
Saguaro-Marana 115/138kV Transmission Line Project
Arizona G&T Cooperatives

Source: ESRI, Burns & McDonnell

Issued: 4/27/2022

Path: I:\ESP\Projects\KPEC\Saguaro_Marana_115kV\Figures\CEC_Application\FIG_01_00_Preferred_Route_Double_Circuit.mxd sjensley 4/27/2022
Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

EXHIBIT AEPCO-3

TESTIMONY SUMMARY OF KEVIN BARNES

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibit.

Testimony Summary of Kevin Barnes – Panel 1

Kevin Barnes is the Environmental Permitting and Land Services Manager of Arizona Electric Power Cooperative ("AEPCO"). In his current position, Mr. Barnes supports all aspects of AEPCO's siting, permitting and approval processes for both electric transmission line projects and electric substation projects.

Mr. Barnes has over 14 years of experience in the electric utility industry. He has participated in several line siting matters in Arizona and has helped developed and managed several large transmission line projects designed to improve reliability of AEPCO's electrical system. Mr. Barnes holds a B.A. in Wildlife and Fisheries Science from the University of Arizona.

At the hearing, Mr. Barnes will introduce the Project, describing its general characteristics and the proposed site in Pima, Arizona. He will describe the Project's purpose and benefits as well the need for Saguaro to Marana 115/138kV Project. Additionally, he will discuss the Projects origination and development, including the public engagement throughout the process. Mr. Barnes will outline AEPCO's Certificate of Environmental Compatibility ("CEC") Application, including a description of how it was prepared and what it contains. Mr. Barnes will present testimony regarding compliance with the notice requirements. He will present most of his testimony using a power point presentation, which can be found as Exhibit AEPCO-4.

Mr. Barnes, along with Mr. Randall Simpson, will also guide the virtual flyover of the Project. The virtual tour will provide a view of the Project site and the surrounding area.

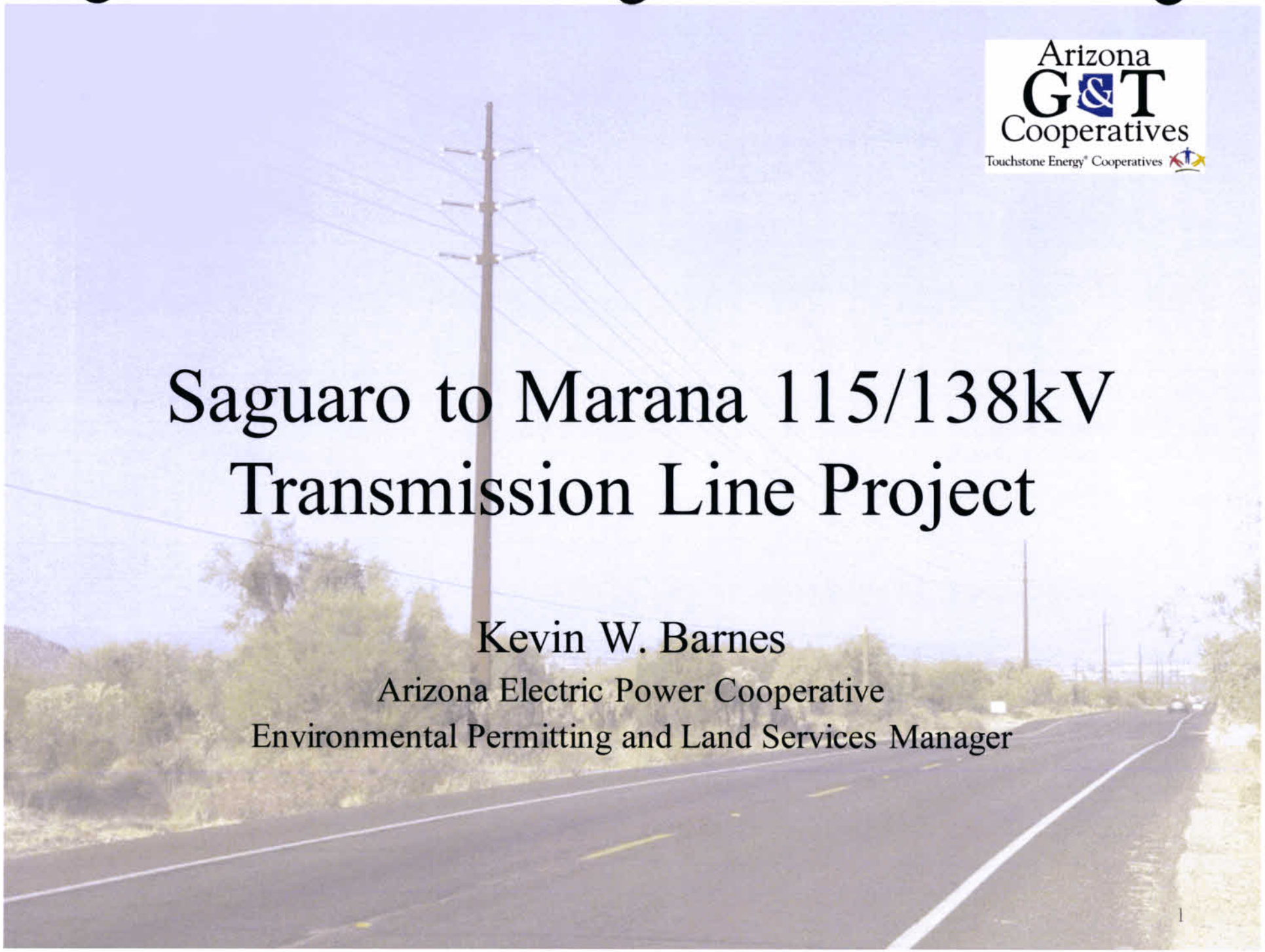
.

EXHIBIT AEPCO-4

WITNESS PRESENTATION OF KEVIN BARNES

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibit.



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Saguaro to Marana 115/138kV Transmission Line Project

Kevin W. Barnes
Arizona Electric Power Cooperative
Environmental Permitting and Land Services Manager

Introduction

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Employment:

- Arizona Electric Power Cooperative, Environmental Permitting and Land Services Manager

Education and Experience:

- B.A. Wildlife and Fisheries Science, University of Arizona
- 14 years' experience in the electric utility industry

Role and Responsibility

- Supervised preparation of CEC Application and supporting exhibits
- Coordinated with engineering staff to confirm technical aspects of the project

Testimony Overview

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- Brief overview of Arizona Electric Power Cooperative (AEPCO)
- Project Description
- Purpose and Need for the Project
- CEC Notice Requirements
- Technical Aspects of the Project
- Cost of the Project

AEPCO

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- AEPCO is a not-for-profit generation and transmission cooperative owned by its member distribution cooperatives.

- AEPCO has five Arizona Class A member nonprofit distribution cooperatives that deliver power at retail to several rural areas of the state.

- AEPCO is a Rural Utilities Service (RUS) borrower, which requires compliance with the National Environmental Policy Act (NEPA).

AEPCO (Continued)

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- **Class A Members**
  - Trico Electric Cooperative, Inc.
  - Sulphur Springs Valley Electric Cooperative, Inc.
  - Duncan Valley Electric Cooperative, Inc.
  - Graham County Electric Cooperative, Inc.
  - Mohave Electric Cooperative, Inc.

- **Total Supporting Infrastructure**
  - Maintain and operate 621 miles of high voltage transmission lines
  - Operate and Maintain 27 substations

Project Description

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- The Project consists of the construction and operation of a new transmission line between the planned Trico Electric Cooperative Inc. (Trico) Adonis Substation and the existing AEPCO Marana Substation near Marana, Arizona.
- The Project consists of two separate transmission line configurations. One portion of the Project is a double-circuit 115/138kV transmission line to be jointly owned by AEPCO and TEP. The other portion of the Project is a single-circuit transmission line owned and operated by AEPCO alone.
- In compliance with A.R.S. § 40-360.02, AEPCO and TEP have filed Ten-Year Plans each year from the inception of the statutory requirement through 2022.

Project Description (Continued)

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- The transmission line originates at Trico's planned Adonis Substation. The location of the planned Adonis Substation enables AEPCO to connect to an existing transmission line, then interconnect to Arizona Public Service Company's ("APS") existing Saguaro Substation located approximately seven miles northwest of the planned Adonis Substation.

Project Description (Continued)

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- The proposed double-circuit 115/138kV transmission line would proceed west approximately four miles crossing Interstate 10, continuing to the intersection of Marana Road and Wentz Road. At the intersection of Marana Road and Wentz Road, the 138kV line will be terminated for future use by TEP once a new substation location has been determined. From the intersection of Marana Road and Wentz Road, the line will proceed another four miles as a single circuit 115kV transmission line to the existing AEPCO Marana Substation.

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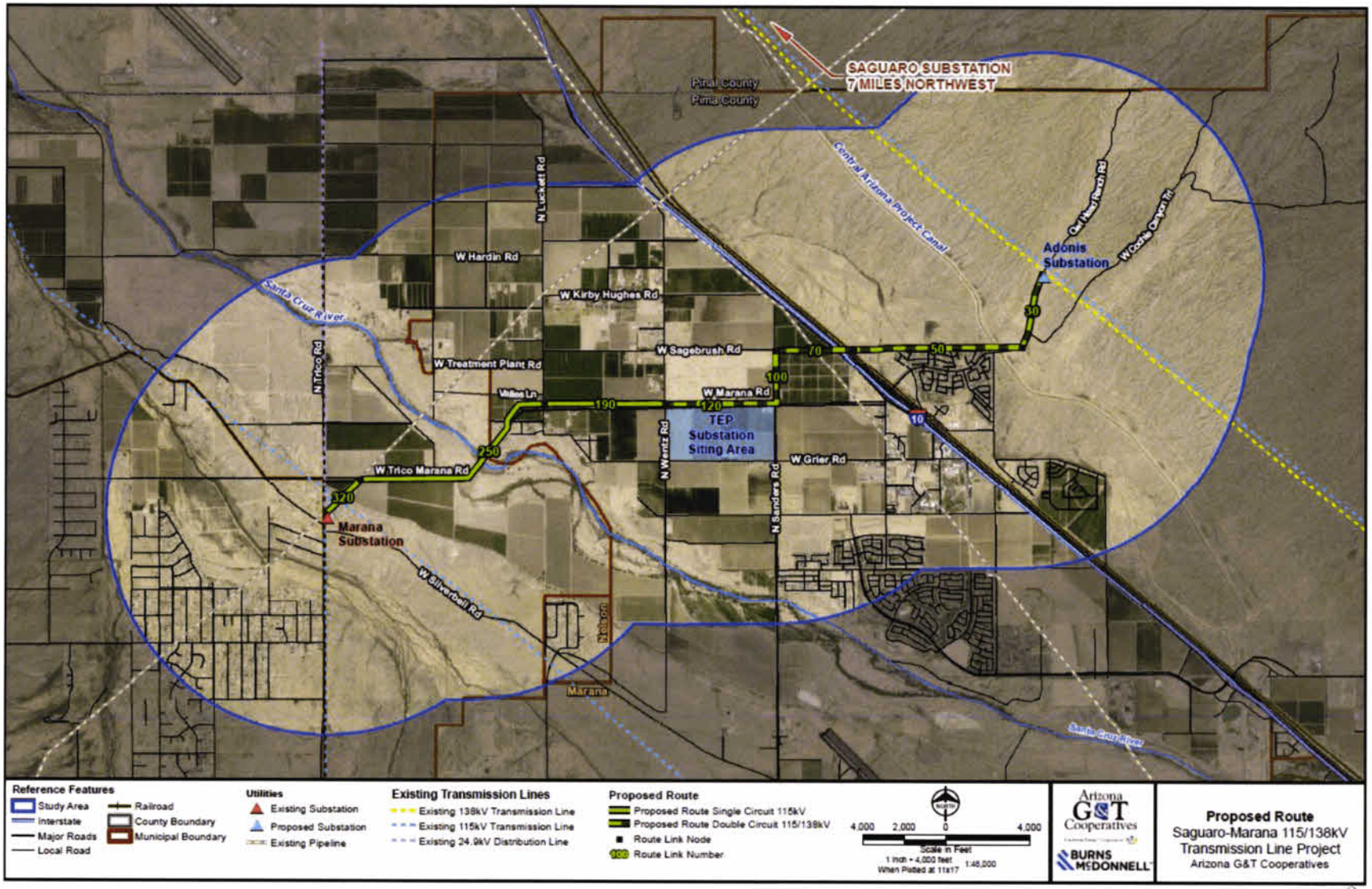

Proposed Route
Saguaro-Marana 115/138kV
Transmission Line Project
Arizona G&T Cooperatives

Project Description (Continued)

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- The Project is anticipated to be constructed primarily with self-weathering steel monopole structures approximately 65' to 120' in height with span lengths between 500' and 600', within right-of-ways up to 120' wide.

- The proposed transmission line crosses multiple landowners including; private, Arizona State Land Department, Town of Marana, Central Arizona Project, and Pima County.

Purpose and Need

Arizona G&T Cooperatives
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- The Project purpose and need is to increase electric reliability and serve customers' growing energy needs in the surrounding AEPCO Project area by connecting the planned Trico Adonis Substation, existing AEPCO Marana Substation, and APS's Saguaro Substation.
  - Trico Electric Cooperative submitted a letter of support for the Project.
- The Project will also add transmission capacity on the AEPCO transmission system to support the development of future energy projects.

Information Regarding Hearing Schedule

Arizona G&T Cooperatives
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- Notice of Hearing:
  - Notice of Hearing was published twice within ten days (5/6/2022 and 5/7/2022) of filing the CEC Application in the AZ Daily Star in compliance with A.A.C. R14-3-208.
  - Posted on Project website: www.azgtsaguaromarana.com
  - Posted on notification signs in the vicinity of the Project site
    - Five (5) signs posted at pre-approved locations

Notification Signs Locations

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Notice of Public Hearing Sign

Arizona G&T Cooperatives
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NOTICE OF PUBLIC HEARING

SAGUARO TO MARANA 115/138 kV TRANSMISSION LINE

Arizona Electric Power Cooperative, Inc. (AEPCO) invites the public to participate at the hearing for the above project before the Arizona Power Plant and Transmission Line Siting Committee.

Date	Start Time	Location
June 6, 2022	1:00 p.m.	Northwest Fire Department Training Facility 5125 W Camino De Fuego Tucson, AZ 85743
June 7-10, 2022 (as needed)	9:00 a.m.	Northwest Fire Department Training Facility 5125 W Camino De Fuego Tucson, AZ 85743
Revision to the hearing or touring schedule and additional hearing days will be noticed on the Arizona Corporation Commission's website, available at: https://www.azcc.gov/arizona-power-plant/meeting-schedule		

Public Comment will be taken at the hearing as follows:
6:00 p.m. on June 6, 2022
at Northwest Fire Department Training Facility
5125 W Camino De Fuego
Tucson, AZ 85743

The Project will involve construction of approximately four miles of new double-circuit 115/138 kV transmission line from the proposed Adonis Substation to Wentz and Marana Road and four miles of new 115 kV transmission line from Wentz and Marana Road to the existing Marana Substation.

For more information, visit the following website:
https://azgtsaguaromarana.com/
Email us at: saguaromarana@azgt.coop
or call (520) 586-5252

Arizona Corporation Commission Docket No. L-00000A-22-0102-002203 (Case No. 203)

Pictures of Installed Notification Signage

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CEC Application Locations

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- AEPCO has posted the CEC application at pre-approved locations:
  - Arizona Corporation Commission Docket Control Center, Phoenix Office, 1200 West Washington Street, Suite 108, Phoenix AZ 85007
  - Pima County Board of Supervisors, 33 N. Stone Ave., 11th Floor, Tucson, AZ 85701
  - Marana Municipal Complex, 11555 W. Civic Center Drive, Marana, AZ 85653
  - Wheeler Taft Abbett Sr. Library, 7800 N. Schisler Drive, Tucson, AZ 85743
  - The Project Website: www.azgtsaguaromarana.com

- Pursuant to A.A.C. R14-3-208, AEPCO provided Notice of Service to Affected Jurisdictions via certified mail to the Town of Marana, Pima County, and the Arizona State Land Department

Technical Aspects

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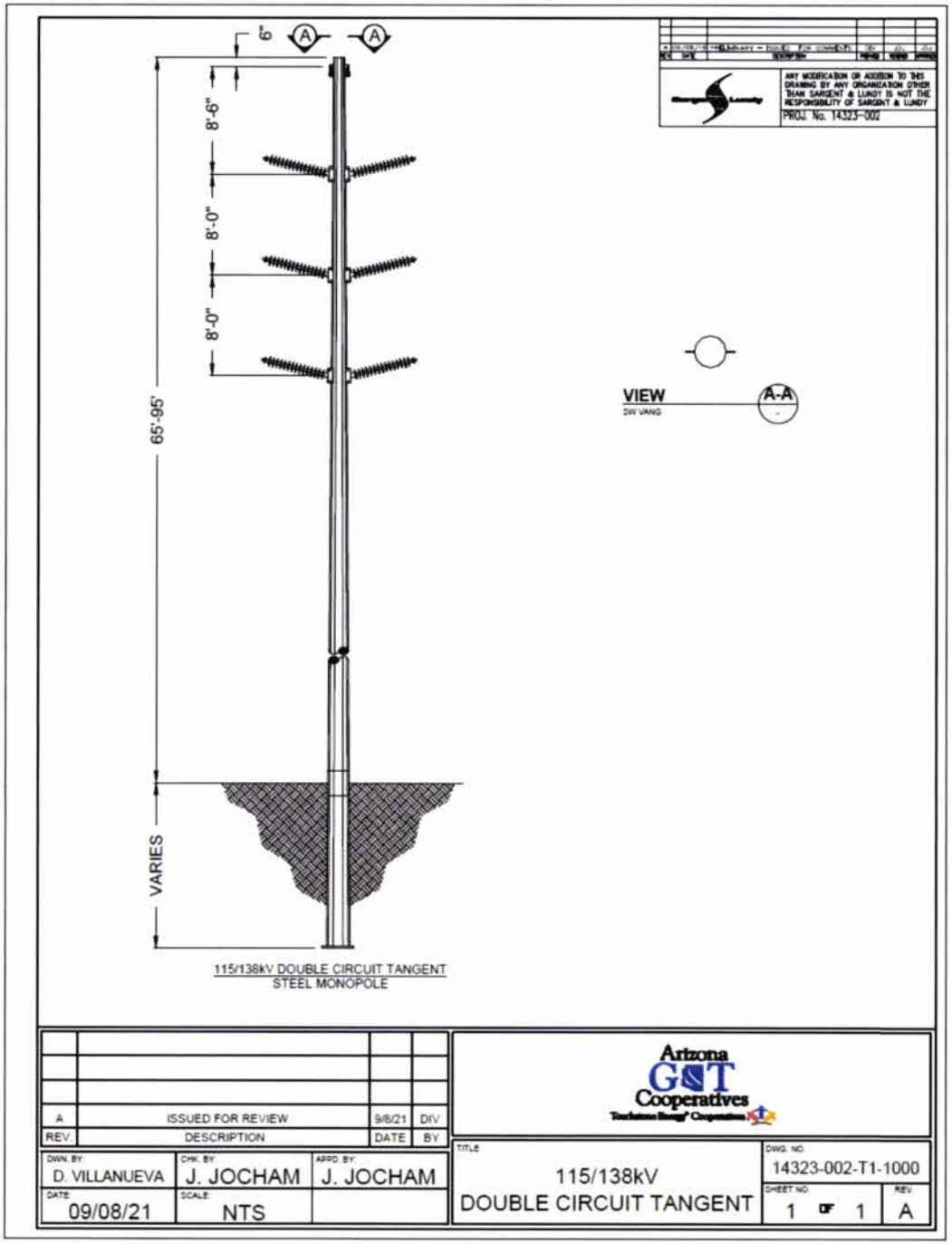
- The line will be approximately 8 miles in length: 4 miles double-circuit 115/138 kV and 4 miles single circuit 115 kV

- Structures will be between 65' and 120' in height

- Average span distance 500' to 600'

- The conductor will be 954 kcmil Cardinal ACSS (Aluminum Conductor Steel Supported)



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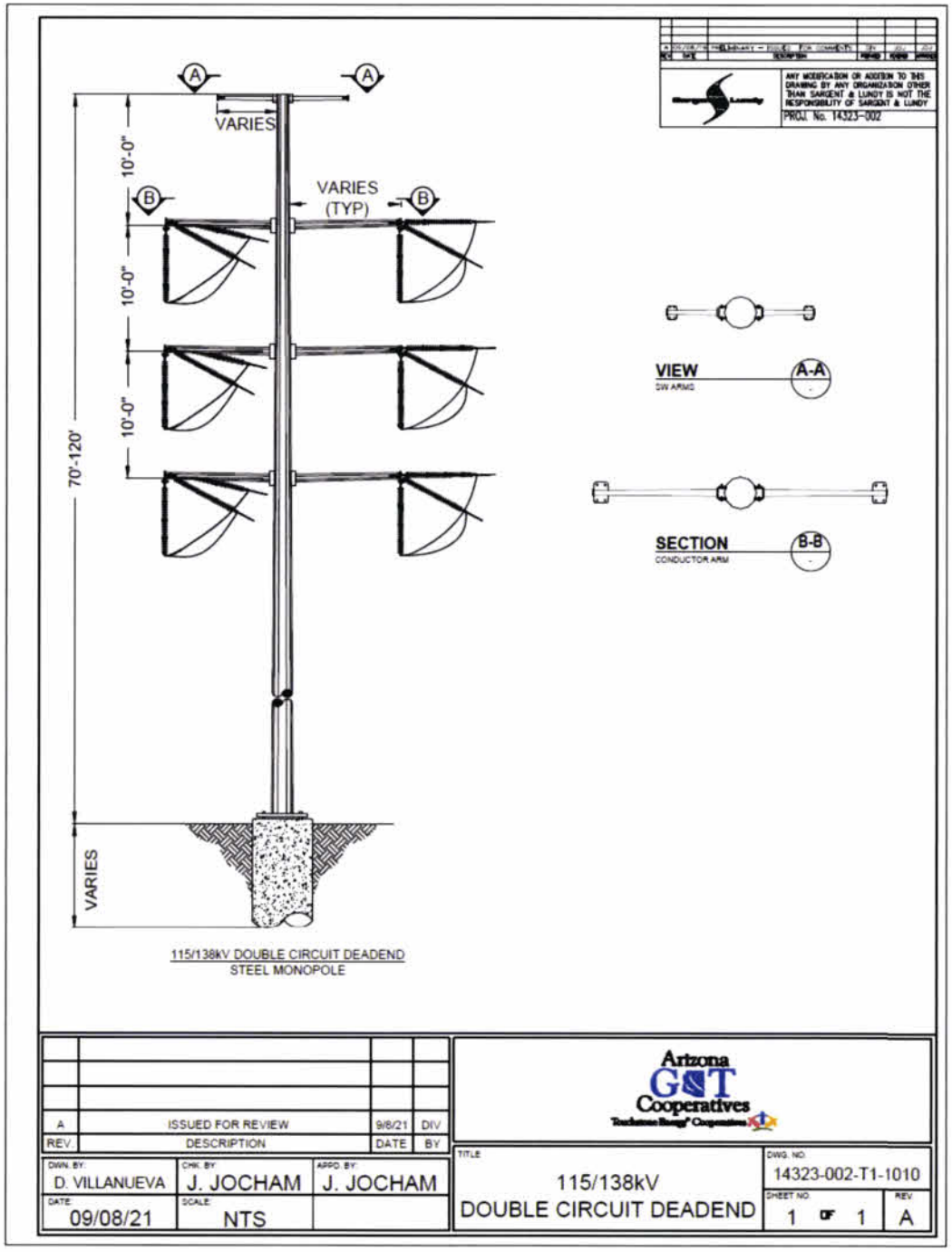

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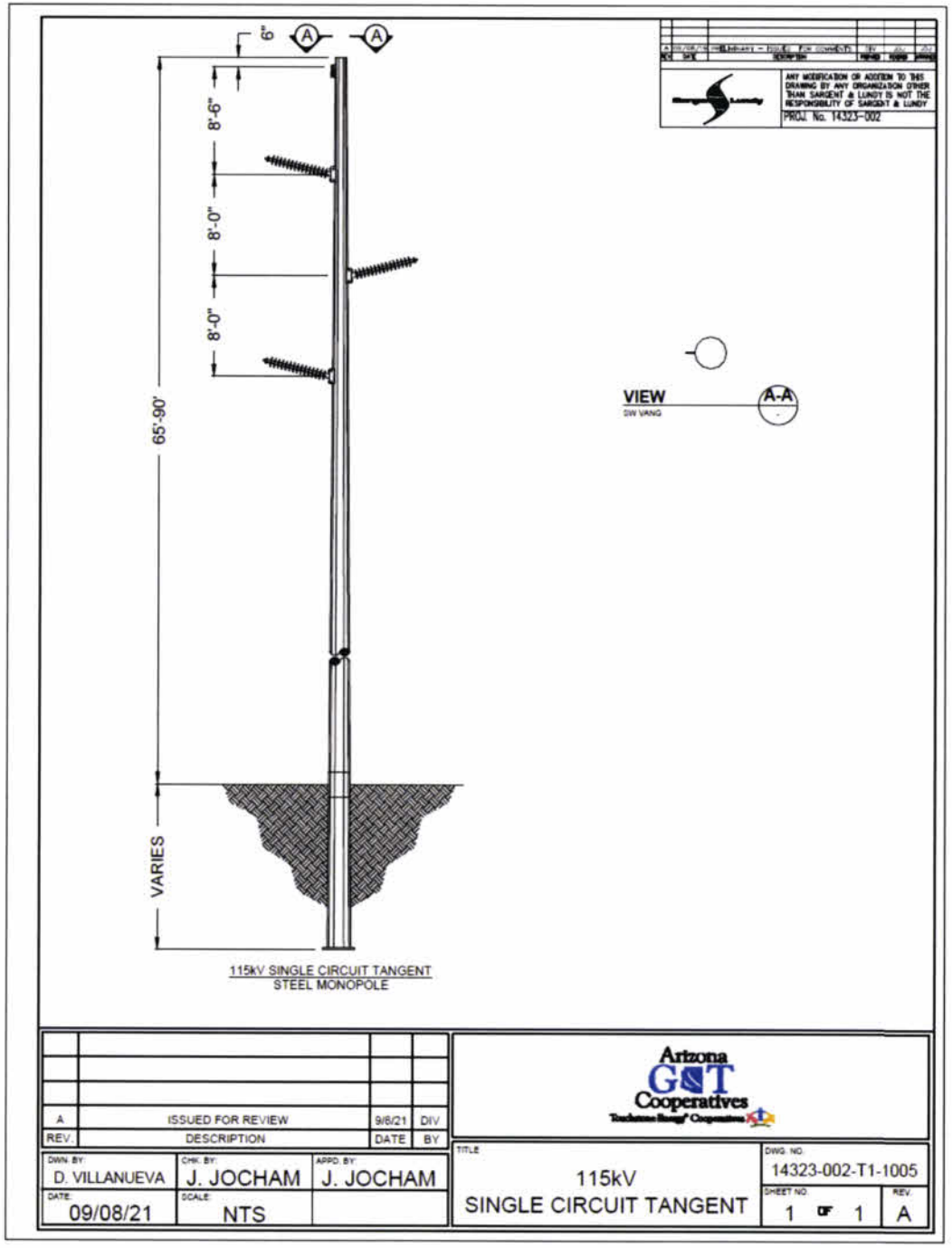

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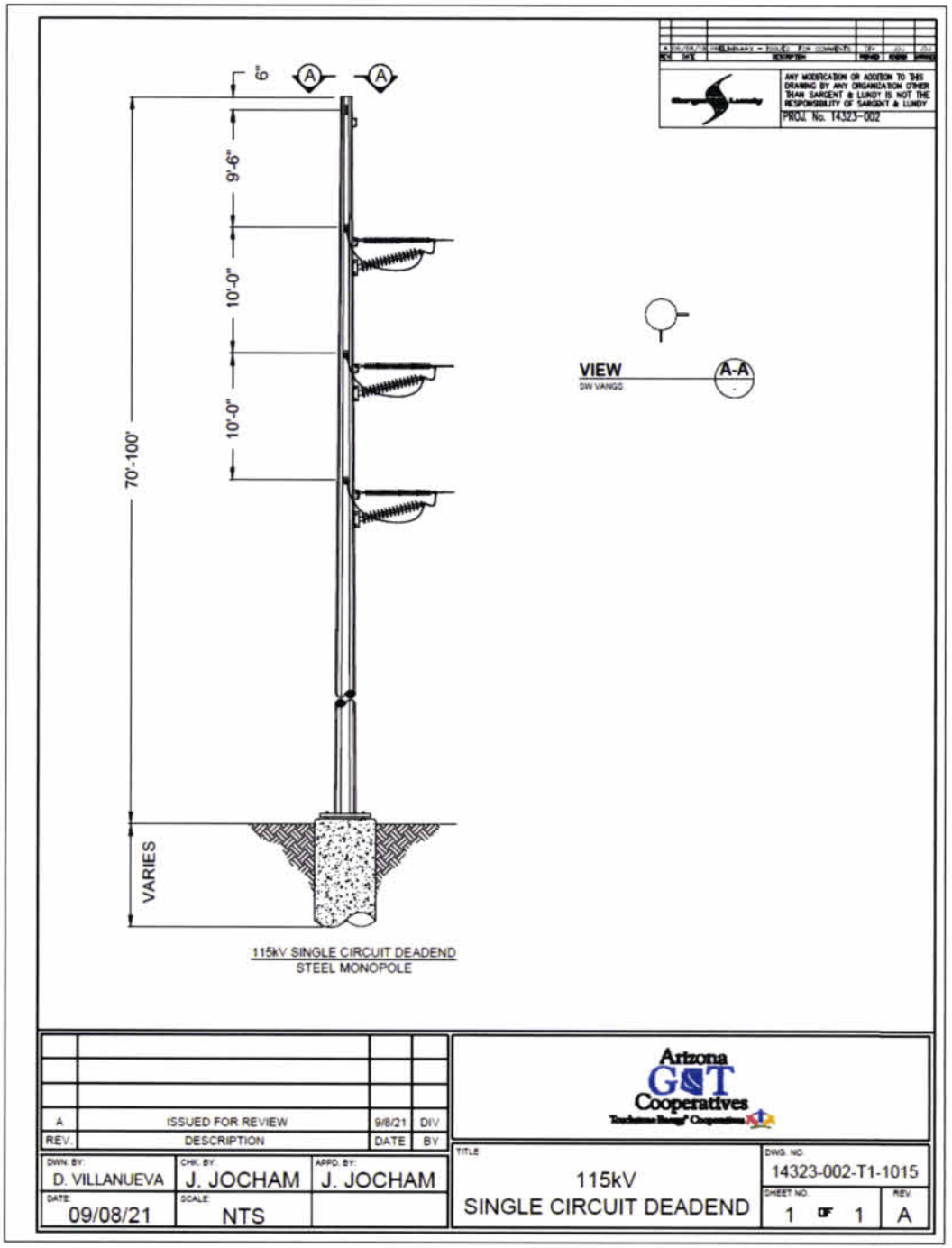

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Estimated Project Cost

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Transmission Line Route	Total Length (miles)	Right-of-Way Costs (USD)	Construction Costs	Total Costs
AEPCO	7.98	$870,480	$5,940,000	$6,810,480
TEP	3.78	$200,707	$1,980,000	$2,180,707
Total	**11.76**	**$1,071,187**	**$7,920,000**	**$8,991,187**

Conclusion

- The co-location of TEP and AEPCO assets will minimize environmental impacts and provide efficiencies in the permitting processes required to build the facilities.

- The project results in increased system reliability for AEPCO, TEP, and Trico.

- To date there has been very little opposition to the project expressed by the public, contacted agencies, or jurisdictions.

- AEPCO respectfully requests that the Committee issue a recommendation to the Commission to approve a CEC for the Project, and that the Commission approve such recommendation pursuant to A.R.S. § 40-360.07(A).

EXHIBIT AEPCO-5

AEPCO TEN-YEAR PLANS

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following AEPCO Ten-Year Plans.

Exhibit AEPCO-5A	AEPCO Ten-Year Plan for 2022 (Jan. 31, 2022)
Exhibit AEPCO-5B	AEPCO Ten-Year Plan for 2021 (Jan. 28, 2021)

EXHIBIT AEPCO-5A

AEPCO TEN-YEAR PLAN FOR 2022 (JAN. 31, 2022)

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibit.

ORIGINAL

E000017667

Arizona G&T Cooperatives

Touchstone Energy® Cooperatives

January 31, 2022

Docket Control
Arizona Corporate Commission
1200 West Washington Street
Phoenix, AZ 85007

RE: NOTICE OF FILING – ARIZONA ELECTRIC POWER COOPERATIVE, INC.'S (AEPCO) 20022 – 2031 TEN-YEAR PLAN AND TECHNICAL STUDY REPORT DOCKET NO E-99999A-21-0009

Pursuant to A.R.S. § 40-360.02, attached is AEPCO's 2022 – 2031 Ten-Year Transmission Plan and Technical Study Report. If you have any questions, please contact me at (520) 586-5203.

Sincerely,

Charles Alves
Senior Attorney

Enc.

Arizona Electric Power Cooperative, Inc. · Sierra Southwest Cooperative Services, Inc.
P.O. Box 670 · 1000 S. Hig[illegible]

Arizona G&T Cooperatives

Touchstone Energy® Cooperatives

TEN-YEAR TRANSMISSION PLAN

2022 – 2031
Docket No. E-99999A-21-0009

January 2022

ARIZONA ELECTRIC POWER COOPERATIVE, INC.

TEN-YEAR TRANSMISSION PLAN

2022 – 2031

Prepared for the

ARIZONA CORPORATION COMMISSION

Docket No. E-99999A-21-0009

Table of Contents

General Information

This Ten-Year Transmission Plan is being submitted to the Arizona Corporation Commission (ACC) to satisfy the requirements of § 40-360.02 of the Arizona Revised Statutes (A.R.S.), relating to power plant and transmission line siting requirements. It outlines the plans of Arizona Electric Power Cooperative, Inc. (AEPCO) to install electric facilities required to reliably meet the system load growth of its Distribution Cooperative Members (Members) and other network customers or reliability requirements applicable to AEPCO's transmission system.

This report contains transmission projects that AEPCO anticipates may be constructed over the next ten-year period. As noted in A.R.S. § 40-360.02.F, the plans contained in this report are tentative information only and are subject to change at any time at the discretion of AEPCO. AEPCO anticipates that any changes to this plan will likely be due to changes in load forecasts, environmental constraints, economic considerations, other utilities' plans, regulatory and legal developments, as well as future regional and federal mandates. All transmission projects are subject to a peer-review by AEPCO's Operating Committee (OC) before submittal to the AEPCO Board of Directors for approval. Meetings of the OC are held quarterly, or as needed, and changes to these projects are reviewed as necessary to meet the Member's needs. The OC reviews the Construction Work Plan (CWP) that is then submitted to the AEPCO Board of Directors for approval. Once the CWP is approved, the projects are considered by AEPCO as "planned" projects. Projects that have not been vetted by the OC for placement into a CWP, may be included in ten-year plan filings but will be listed as "conceptual" projects with tentative or "to-be-determined" (TBD) in-service dates. TBD, as used in this document, means that in addition to the project not being yet vetted by the OC, it can also mean that the project is still in negotiations with other entities.

This specific report is divided into two sections, as outlined in the table of contents. Section I describes planned transmission lines and projects AEPCO may construct over the ten-year plan period. Section II contains AEPCO's internal planning criteria and facility ratings, according to Commission Decision #63876, dated July 25, 2001.

A technical study report to satisfy the requirements of paragraph C.7 of A.R.S. §40-360.02 has been prepared as a stand-alone document and will be filed jointly with this document.

Regional Planning

AEPCO has been an active participant in regional and sub-regional transmission planning efforts within the Western Interconnection for many years. This participation has been through membership in the Western Electricity Coordinating Council (WECC), WestConnect (WC), and Southwest Area Transmission (SWAT). AEPCO is an active participant within the following committees of WECC:

- Reliability Assessment Committee (RAC)
- Operating Committee (OC)
- System Review Subcommittee (SRS)

AEPCO will continue to be involved in regional planning through WC and SWAT and the Western Interconnection with representation in the RAC, OC, SRS, and any other subcommittees and task forces created in conjunction with WECC as necessary.

AEPCO continues its involvement in the regional transmission planning activities of WC as a Coordinating Transmission Owner (TO) in the TO with Load Serving Obligations Sector. WC coordinates its efforts with other regional planning entities and inter-regionally within the Western Interconnection, to comply with the provisions of the Federal Energy Regulatory Commission (FERC) Order No. 1000 "Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities" that was issued July 21, 2011.

The Planning Management Committee (PMC) under the Planning Participation Agreement (PPA) that was filed on November 17, 2014, is responsible for development of a Regional Transmission Study Plan, development of an annual budget for the regional and inter-regional planning processes, activities, functions, development of planning models, identification of regional transmission needs, submittal of projects to meet regional transmission needs, identification of beneficiaries, and cost allocation.

Projects Overview

On October 8, 2020, AEPCO's Board of Directors approved the 2021-2024 CWP. The CWP identified several projects that will be included in this year's Ten-Year Plan as planned projects. Projects with projected in-service dates outside of the current CWP window with a high likelihood of construction will be included as planned projects in this report. Additional projects proposed after the approval of the current CWP will be included in this document. Projects holding a higher degree of uncertainty with no firm in-service dates will be included as "Additional Projects under Consideration."

Completed Projects

No planned projects have been completed as of the publishing of this Assessment.

Planned Projects

Marana Capacitor Project: This projects involves the addition of a 14.4 MVAR capacitor bank at the Marana 115 kV Substation. The driving factor for this project is reliability. The projected in-service date is 2023.

Schieffelin Project: This Cochise County Project includes looping the AEPCO Butterfield to San Rafael 230 kV line into a new substation (Schieffelin) with a 230/69 kV transformation and connection to the existing Sulphur Springs Valley Electric Cooperative, Inc.'s (SSVEC) Tombstone Junction and St. David Substations. Schieffelin Substation will also be connected to APS' Boothill Substation by a 10.4-mile 69 kV line. The driving factor for this project is reliability. The projected in-service date is 2022.

Saguro-Marana Project: This project ultimately involes an interconnection with APS' Saguaro 115 kV substation to the AEPCO's 115 kV Thornydale substation. This project will be completed in several phases starting with Phase I in 2022 involving the 115 kV interconnection between Thornydale and Saguaro. Phase II, projected for 2023, involves the construction of the Adonis 115 kV Substation with the Thornydale-Saguaro interconnection being looped into the new substation.

Finally, Phase III projected for 2024 involves the construcion of a new 115 kV transmission line between Thornydale and Marana. The overall projected in-service date is 2024.

Marana Substation Rebuild: This project is a rebuild of the Marana Substation in order to accept direct connections from the looped-in Western Area Power Administration (WAPA) Electrical District 5 (ED5) – Rattlesnake 115 kV transmission line. Currently, the ED5 – Rattlesnake line is looped in through a tap configuration, this rebuild intends to remove the tap configuration as well as any additional substation work required. The driving factor for this project is reliability. The projected in-service date is 2024.

Additional Projects under Consideration

AEPCO continues to study the feasibility of additional projects for inclusion into future Ten-Year Plans that have been deferred from previous Ten-Year Plans, for various reasons.

A brief description of each of these projects is for informational purposes only. A driving factor is provided for each of these projects per the ACC's Biennial Transmission Assessment recommendations. These projects are under consideration but have not advanced far enough to have a projected in-service date.

AEPCO will continue to hold discussions with potential project participants throughout 2020, and if refined project scopes have been established with agreements from project participants, and with approvals from governing boards, these projects may be reflected in the next Ten-Year Plan.

Ft. Huachuca Interconnection Project – This project will connect AEPCO's 69 kV system to TEP's 138 kV system at Fort Huachuca via a 69 kV line between the two substations. This project is currently on hold. The driving factor for this project is reliability.

Apache/Hayden to San Manuel 115 kV Line: This project has been presented in previous AEPCO Ten-Year Plans, but has been deferred beyond the Ten-Year Plan horizon. It was approved by the ACC on June 26, 2018 (Decision #76765). This project proposes the installation of a 4.5 mile 115 kV line from the existing AEPCO Apache to Hayden 115 kV line to the existing APS San Manuel Substation. Currently, this project is under consideration by a solar developer. This project will require an agreement with APS and additional studies. The driving factor for this project is reliability.

Central Arizona Project (CAP) 115 kV Line Tap to AEPCO Sandario Substation: This project proposes that a new 0.6-mile 115 kV line be tapped off of the existing CAP Sandario to Brawley 115 kV line, to tie into the existing AEPCO Sandario Substation. This line project will require an agreement from CAP and additional studies. The driving factor for this project is reliability.

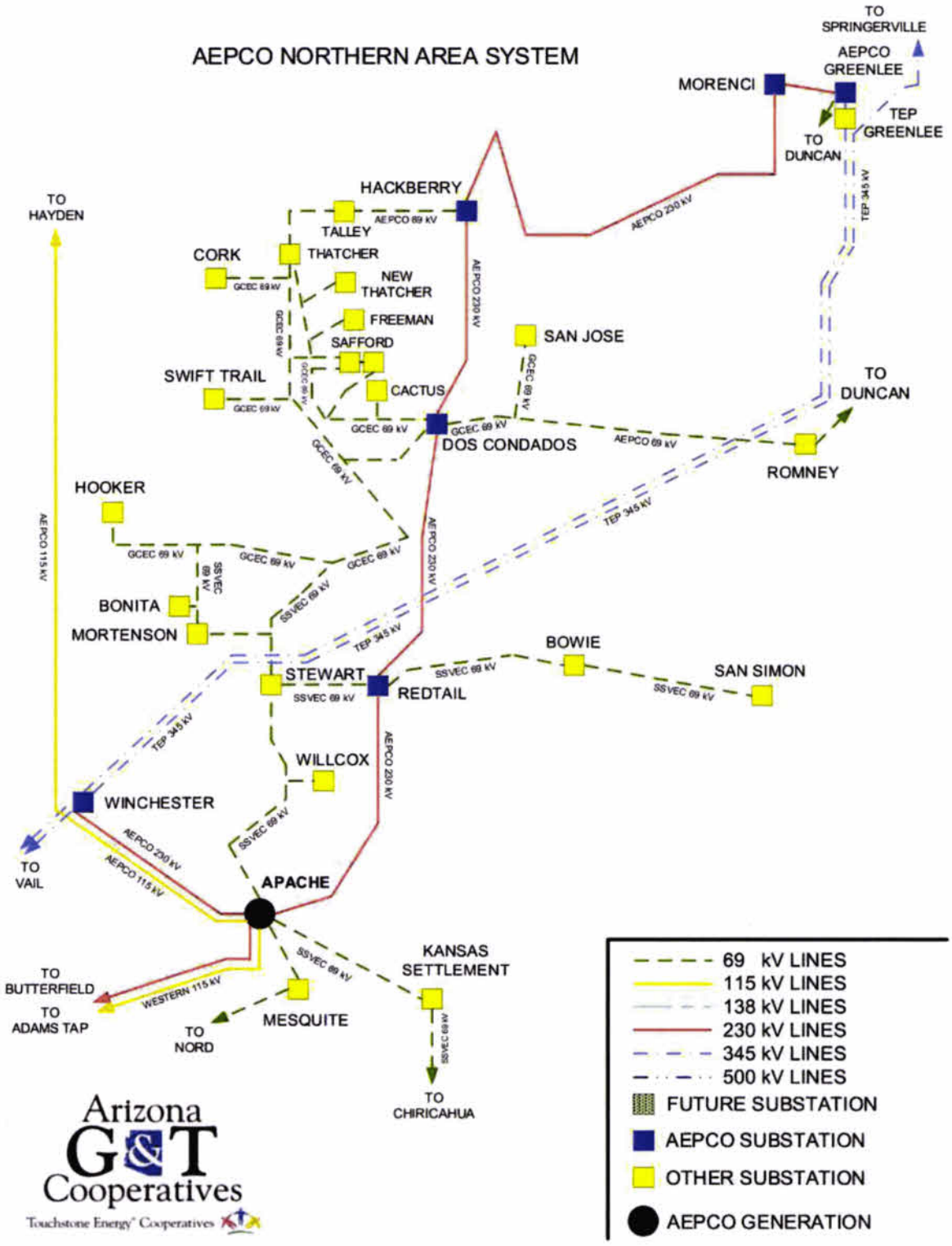
AEPCO Transmission System and Project Maps

The following maps are included to show the location of existing and future transmission projects, and as presented in the earlier Planned Projects section. The planned additions of AEPCO's Members are not included on these maps or reflected in this filing.

The maps included in this report are:

Figure 1 – AEPCO Northern Area
Figure 2 – AEPCO Southern Area
Figure 3 – AEPCO Western Area
Figure 4 – AEPCO California and Northwest Arizona Areas

Figure 1



Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Figure 2

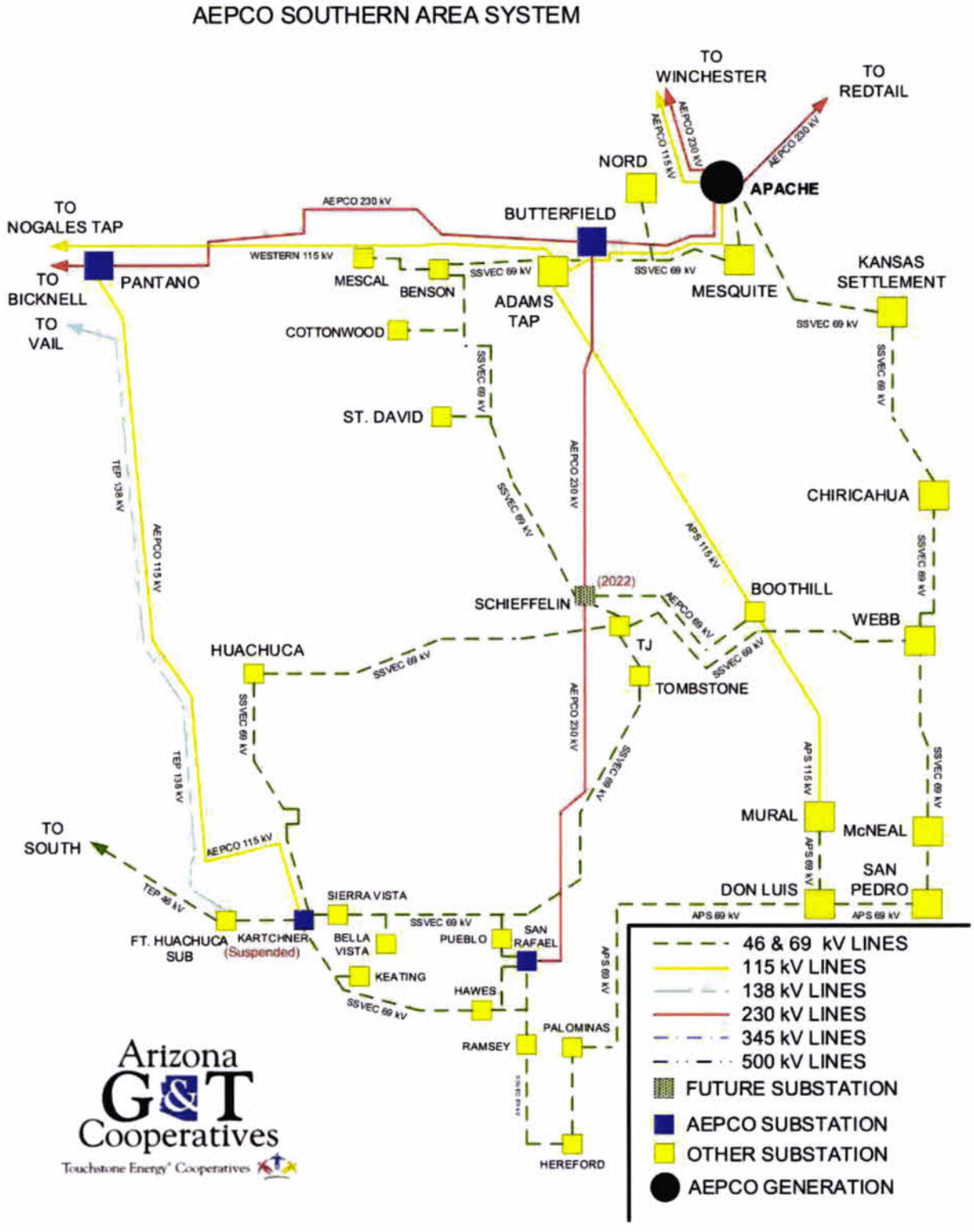

AEPCO SOUTHERN AREA SYSTEM
TO WINCHESTER
TO REDTAIL
NORD
APACHE
AEPCO 230 kV
AEPCO 115 kV
TO NOGALES TAP
BUTTERFIELD
PANTANO
TO BICKNELL
TO VAIL
WESTERN 115 kV
MESCAL
BENSON
SSVEC 69 kV
ADAMS TAP
MESQUITE
KANSAS SETTLEMENT
COTTONWOOD
ST. DAVID
TEP 138 kV
CHIRICAHUA
APS 115 kV
(2022)
SCHIEFFELIN
BOOTHILL
WEBB
AEPCO 69 kV
TJ
HUACHUCA
TOMBSTONE
TO SOUTH
MURAL
McNEAL
SAN PEDRO
DON LUIS
APS 69 kV
SIERRA VISTA
FT. HUACHUCA SUB
KARTCHNER (Suspended)
BELLA VISTA
PUEBLO
SAN RAFAEL
KEATING
HAWES
PALOMINAS
RAMSEY
HEREFORD
Touchstone Energy® Cooperatives
46 & 69 kV LINES
115 kV LINES
138 kV LINES
230 kV LINES
345 kV LINES
500 kV LINES
FUTURE SUBSTATION
AEPCO SUBSTATION
OTHER SUBSTATION
AEPCO GENERATION

Figure 3

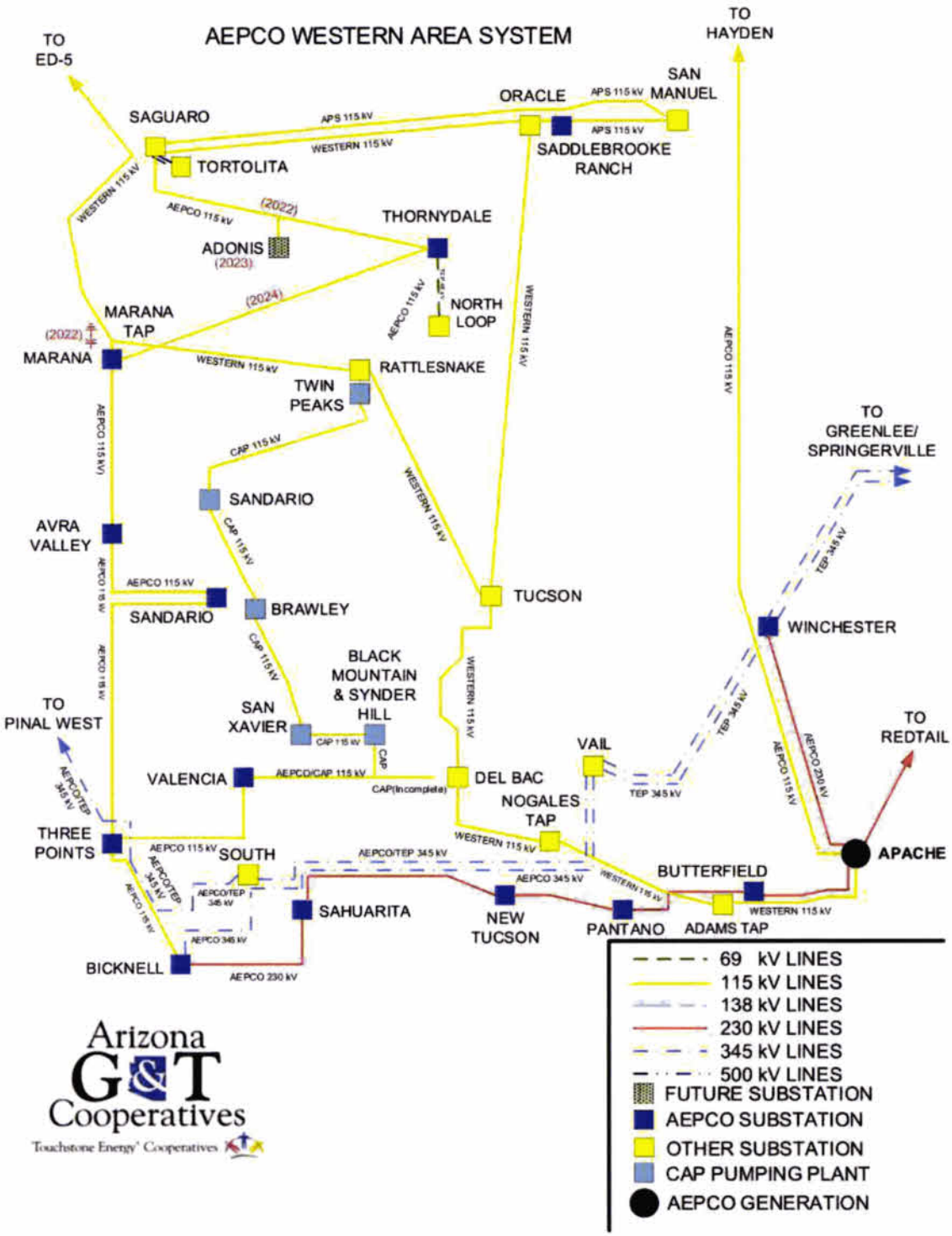


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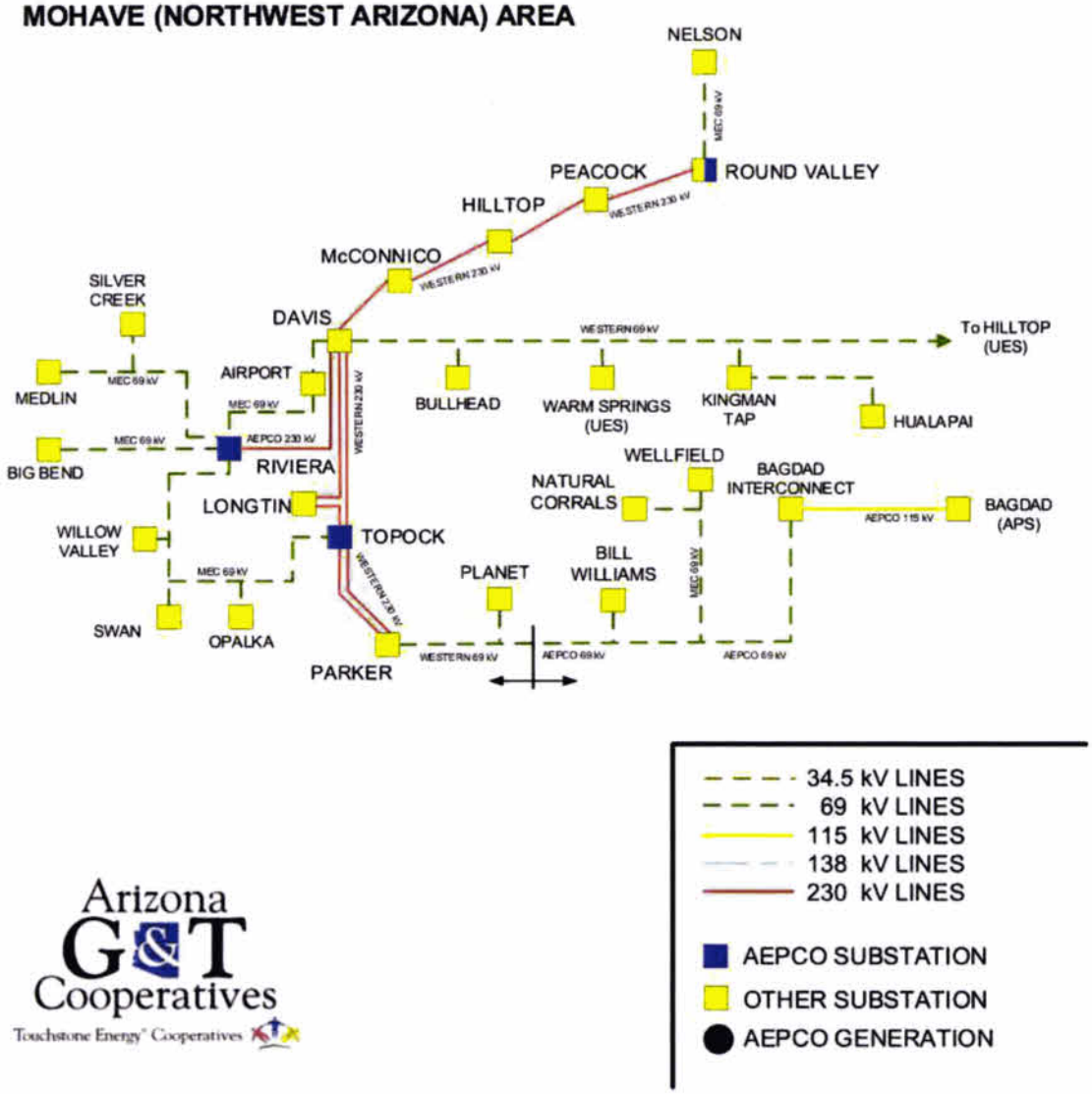
Figure 4

AEPCO CALIFORNIA & NORTHWEST ARIZONA AREA SYSTEMS

ANZA (CALIFORNIA) AREA

MOHAVE (NORTHWEST ARIZONA) AREA



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Touchstone Energy® Cooperatives

Section I – Planned Transmission Projects

Marana Capacitor Bank

Description:

Installation of a new 14.4 MVAr capacitor bank, breaker, and switches at the existing Marana Substation. The driving factor for this project is the reliability of the Bulk Electric System (BES) while supporting forecasted Trico loads.

Project Type: Capacitor Installation

Project Location: Marana Substation, Pima County

Justification: Reliability

AEPCO Estimated Cost: $495,000

In-Service Date: 2023

Schieffelin Project

Description:

This Cochise County Project includes looping the AEPCO Butterfield to San Rafael 230 kV line into a new substation (Schieffelin) with a 230/69 kV transformation and connection to the existing SSVEC Tombstone Junction and St. David Substations. Schieffelin Substation will also be connected to APS Boothill Substation by a 10.4-mile 69 kV line.

Project Type: Multiple Transmission Elements

Project Location: Cochise County

Justification: Reliability

AEPCO Estimated Cost: $8,000,000

In-Service Date: 2022

Saguaro-Marana Project

Description:

This project ultimately involes an interconnection with APS' Saguaro 115 kV substation to the AEPCO's 115 kV Thornydale substation. This project will be completed in several phases starting with Phase I in 2022 involving the 115 kV interconnection between Thornydale and Saguaro. Phase II, projected for 2023, involves the construction of the Adonis 115 kV Substation with the Thornydale-Saguaro interconnection being looped into the new substation. Finally, Phase III projected for 2024 involves the construcion of a new 115 kV transmission line between Thornydale and Marana. Currently, this project is undergoing additional discussions with neighboring utilities.

Project Type: Transmission Line Installation

Project Location: Pima County and Pinal County

Justification: Reliability

AEPCO Estimated Cost: TBD

In-Service Date: 2022-2024

Marana Substation Rebuild

Description:

This project is a rebuild of the Marana Substation in order to accept direct connections from the looped-in WAPA ED5 – Rattlesnake 115 kV transmission line and/or AEPCO's line from Thornydale. Currently, the ED5 – Rattlesnake line is looped in through a tap configuration, this rebuild intends to remove the tap configuration as well any additional substation work required.

Project Type: Substation Rebuild

Project Location: Marana Substation

Justification: Reliability

AEPCO Estimated Cost: TBD

In-Service Date: 2024

Section II – Internal Planning Criteria and Facility Ratings

1 Introduction

In accordance with North American Electric Reliability Corporation (NERC) and Western Electricity Coordinating Council (WECC) standards, this document sets forth the Facility Ratings Methodology (FRM) to cover facilities owned by Arizona Electric Power Cooperative, Inc. (AEPCO). This document provides the consistency and methodology for determining its Facility Ratings in planning and operations of the Bulk Electric System (BES) and determines AEPCO's System Operating Limits (SOLs). AEPCO will modify this methodology to comport with accepted industry practice.

AEPCO, identified as NERC ID# NCR05015 in the NERC Compliance Registry, is registered as a Generator Operator (GOP), Generator Owner (GO), Resource Planner (RP), Transmission Owner (TO), Transmission Operator (TOP), Transmission Planner (TP), and Transmission Service Provider (TSP). Through contracts with other entities, this document may identify applicable TOP functions that AEPCO has been delegated regulatory compliance and reporting responsibility.

For the Metropolitan Water District of Southern California's (MWD) Bulk Electric System (BES) Facilities in the AEPCO Transmission Operator (TOP) footprint, MWD determines its Facility Ratings and provides system changes and updates to AEPCO and the California Independent System Operator (CAISO). The MWD equipment ratings are also located in the CAISO Transmission Registry database in which AEPCO and MWD have access. AEPCO will adhere to CAISO Procedure #3100, Establishing System Operating Limits for the Operations Horizon, for Facilities within the CAISO Balancing Authority Area for which AEPCO has TOP operational responsibility.

2 Statement of Limitations

This document is limited to addressing operating conditions under normal and emergency situations and is not intended to address electrical faults, abnormal operations, failures of covered equipment or establish settings for protective devices. Additionally, the document does not make any assumptions as to the design criteria of legacy equipment and facilities.

2.1 The facilities addressed in this document include generators, transmission conductors, transformers, relay protective devices, terminal equipment, and compensation devices.

2.2 This methodology addresses Normal and Emergency ratings that comprise AEPCO's BES Facilities.

2.3 This methodology considers the ratings provided by equipment manufacturers, the Institute of Electrical and Electronics Engineers (IEEE), and American National Standards Institute (ANSI) standards, ambient conditions for solar input, temperature and wind speed, design criteria, operating limitations, and other assumptions, as applicable.

2.4 The ratings for all of AEPCO BES Facilities, including but not limited to generators, lines, transformers, and shunt compensation devices shall respect the most limiting applicable Equipment Rating of the individual equipment that comprises that Facility. [1]

2.5 In cases where a facility is jointly owned, the operator of the facility determines the rating and shares the rating with the other joint owners. AEPCO is a joint owner in two transmission lines: The Vail to Westwing 345 kV line, which it co-owns with Tucson Electric Power (TEP) (project operator), and the Hassayampa to Pinal West 500 kV line, which it co-owns with Electrical District 2 (ED2), Electrical District 3 (ED3), Electrical District 4 (ED4), Salt River Project (SRP) (project operator) and TEP. AEPCO is also a co-owner with TEP (project operator) in the Pinal West 500/345 kV transformer. Information on co-owned facilities is included in Appendices A and B. [2]

2.6 In cases where a facility is owned in segments (such as a transmission line owned by one party with the breaker being owned by a different party), each owner will determine the rating for their segment and coordinate with the others to determine the most limiting segment. The rating for the most limiting segment will be used for the entire facility.[3]

3 System Performance Criteria (SOL Assessment Methodology)

The annual transmission planning assessments that are used to establish SOLs are based on the NERC Transmission System Planning Standards (P0 through P7 Categories) found in Appendix G, and the WECC System Performance Criteria found in Appendix H. This methodology requires that the BES shall demonstrate transient, dynamic and voltage stability and that all facilities shall be within their thermal, voltage and stability limits. The requirements for the pre-Contingency and post-Contingency states are summarized in Sections 3.1 and 3.2 below, and Appendix G.

In the pre-Contingency and post-Contingency states, all normal and emergency thermal facility ratings are used to identify respective SOLs for the planning horizon. These ratings are reflected in the WECC base case database.

When performing simulations to determine SOLs, AEPCO model's category P1 through P7 contingencies. The contingencies that are selected generally include all possible category P1 contingencies on the AEPCO system, as well as a select set of P1 contingencies on neighboring systems and select Category P2 through P7 contingencies on the AEPCO and neighboring systems, These contingencies pertain only to the interconnected transmission system in southeast Arizona that have been previously studied based on sound

[1] FAC-008-3 R3.3
[2] FAC-008-3 R3
[3] FAC-008-3 R3

engineering judgment as having a potential impact on AEPCO and the neighboring systems. Known specific local area protection schemes (LAPS) will be modeled. Radial, coincidental, system facilities of less than 100 kV are not generally modeled in a level of detail as they have been found not to impact the AEPCO system. However, for specific studies involving AEPCO Member Systems, facilities less than 100 kV have been modeled in accordance with NERC and WECC Criteria.

Unless specified otherwise, AEPCO bus voltage limits for any bus in the pre-Contingency and post-Contingency states shall be as noted in Sections 3.1 and 3.2 below. Demand uncertainty margins will be run at 5% for Category P1 and P2 contingencies and 2.5% for Category P3 through P7 contingencies. Transient stability runs will be simulated for at least 10 seconds.

AEPCO bus voltage limits cannot exceed the limits described in the WECC's TPL-001-WECC-CRT-3.1 standard fully described in the AEPCO's most current Transmission Planning Assessment document.

Contingency cases that do not solve will be analyzed to determine the cause of divergence.

AEPCO does not have any Interconnection Reliability Operating Limits (IROLs) anywhere in AEPCO service area. According to RC methodology[4] IROLs are distinguished from SOLs in a few ways (copied from referenced document):

1. An IROL is a subset of SOLs that is associated with instability, uncontrolled separation, or Cascading. SOLs include a broader set of limitations, including Facility Ratings and System Voltage Limits, and certain non-IROL stability limitations.

2. IROL exceedance is associated with heightened risk to the reliability of the BES. The reliability consequences associated with exceeding an IROL are more severe and adversely impactful than the reliability consequences associated with exceeding an SOL that is not an IROL. This distinction is seen in the following:

    a. IROL exceedance is associated with heightened risk to the reliability of the BES. The reliability consequences associated with exceeding an IROL are more severe and adversely impactful than the reliability consequences associated with exceeding an SOL that is not an IROL. This distinction is seen in the following:

    b. While the NERC Reliability Standards require that any SOL exceedance identified in Operational Planning Analyses must have an associated Operating Plan, the standards require that IROLs have an Operating Plan/Process/Procedure that contains steps up to and including load shedding to prevent exceeding the IROL.

[4] Reliability Coordination, System Operating Limits Methodology for the Operations Horizon, Rev. 8.1, effective April 1, 2017 p.50

3. IROLs should be established such that when an IROL is exceeded, the Interconnection has entered into an N-1 or credible N-2 insecure state, i.e., the most limiting single P1 Contingency or credible MC could result in instability, uncontrolled separation or cascading outages that adversely impact the reliability of the BES.

An IROL is defined in the NERC Glossary of Terms as:
A System Operating Limit that, if violated, could lead to instability, uncontrolled separation, or Cascading outages that adversely impact the reliability of the Bulk Electric System.

As studies are performed and contingencies are analyzed, AEPCO shall identify any SOLs that may qualify as IROLs, according to the above definitions. A goal of the long-term planning process is to assure that any IROLs are identified and not exceeded in pre-Contingency and post-Contingency conditions.

The following sections describe the AEPCO internal planning criteria to aid in the establishment of SOLs in the operating and planning timeframes. Operating system studies and planning system studies can be considered adequate if they follow the criteria listed, but in all cases, it is required that sound engineering and operating judgment be the final rule.

3.1 Normal Operating Conditions (pre-Contingency):

a. Transmission lines should not be loaded greater than 100% of the thermal rating of the conductors.
b. Transformers, circuit breakers, current transformers, and other equipment should not be loaded above their continuous nameplate rating.
c. Transmission system voltages should not fall below 0.95 p.u. of nominal nor rise above 1.05 p.u. of nominal.
d. For long-range planning system studies, an appropriate power factor for the planning period will be used.
e. For operating system studies, an appropriate power factor for the operation-planning period will be used.

An exception may arise in which normal operating limits may vary from those above. AEPCO will adhere to the system operating limits set forth by the Transmission Planner who has jurisdiction over the applicable facilities.

3.2 Emergency Operating Conditions (post-Contingency):

a. Transmission lines should not be loaded greater than the specified emergency ratings.
b. Transformers should not be loaded greater than the specified emergency rating of the transformers.

c. Circuit breakers, current transformers, and other equipment should not be loaded above their continuous nameplate rating, except as permitted under applicable IEEE standards.
d. Transmission system voltages should not fall below 0.90 p.u. of nominal nor rise above 1.10 p.u. of nominal.
e. For long range planning system studies, an appropriate power factor for the planning period will be used.
f. For operating system studies, an appropriate power factor for the operation-planning period will be used.

An exception may arise in which emergency operating limits may vary from those above. AEPCO will adhere to the system operating limits set forth by the Transmission Planner who has jurisdiction over the applicable facilities.

Transformers in the AEPCO system have a normal and emergency rating which is based on the manufacturer's nameplate data. During All Lines In Service (ALIS) operation the loading of the transformer should not exceed its Normal Rating. During system contingencies, the loading of the transformer should not exceed its Emergency Rating. AEPCO follows the recommendations of NERC Standard PRC-023 which limits the ability of automatic protection equipment to de-energize transformers. This allows time to permit operator intervention and helps avoid potential system cascading. In an emergency event, the transformer emergency rating may be exceeded, thus allowing for operator intervention within 30 minutes. Under special circumstances, AEPCO may wish to evaluate other sources in regard to manufacturer's specifications, such as the latest applicable versions of IEEE Standard C57.13-2008, IEEE Std. 57.91-1995 or IEEE Std. C57.119-2001.

Ampacities for the bulk of AEPCO's transmission lines have been developed using the calculations based on IEEE Standard 738 in its analysis of determining the current-temperature relationship of its lines. Calculations were made for each conductor that is used on the AEPCO system, and for standard conductor sizes that could be used on the transmission system as needed for future load growth. The calculations for normal operating conditions use the design criteria of 75° C, and the emergency operating conditions use a conductor design temperature rating of 100° C.

All terminal equipment, such as air disconnect switches, power circuit breakers, power circuit switches and current transformers shall be rated according to the manufacturer's nameplate ampacity at the applied nominal voltage. Normal and Emergency Ratings will be identical.

AEPCO compensation devices consist solely of shunt capacitors; there are no series compensation devices on the AEPCO system. Shunt capacitors will be rated according to the manufacturer's nameplate ampacity at the applied nominal voltage. Normal and Emergency Ratings will be identical.

4 Facility Rating Methodologies (SOL Derivation)[5]

4.1 Facility limits

All facility Rating shall respect the most limiting applicable Equipment Rating of the individual equipment that comprises that Facility.

4.2 Generation Facilities[6]

AEPCO has five solely owned BES generating facilities, one black-start unit, and no jointly owned generator facilities. Each generator is located at Apache Station and each unit Facility Rating is limited by the generator itself, and not by the associated step-up transformer and associated equipment. The associated equipment and step up transformers all have ratings exceeding the generator rating, as provided in the Appendices. These BES units are named ST1, ST2, ST3, GT3, and GT4. GT1 is AEPCOs black-start unit and also a combined cycle unit with ST1.

AEPCO's Equipment Ratings are expressed in megawatts based on the equipment's associated generator nameplate kilovolt-amperes and power factor. For equipment located on the secondary side of current transformer circuits, the Equipment Rating will be based on the primary side current, associated generator nameplate kV, and generator nameplate power factor.

The Normal Rating of any one generator is based on the generator manufacturer's nameplate rating and is equal to the maximum generator nameplate rating as reported on Form EIA-860, Annual Electric Generator Report, and EIA 767. From EIA 767, "…report the maximum generator nameplate rating in megawatts. If the nameplate rating is expressed in kilovolt-amperes, convert to kilowatts by multiplying the power factor by the kilovolt-amperes, then convert kilowatts to megawatts by dividing by 1,000. If more than one rating appears on the nameplate, select the highest rating. Do not indicate the nameplate rating of the turbine."

The Emergency Rating of each of AEPCO's generating facilities is equal to the Facility's Normal Rating.

[5] FAC-008-3 R3, R3.1, R3.2, R3.2.1, R3.2.2, R3.2.3, R3.2.4
[5] FAC-008-3 R1, R2, R4 R1.1, R2.1, R2.2, R2.4.1, R2.4.2, R2.3

4.2.1 Table 1: Generator Facility Rating Summary[6]

Facility	Owner's Normal Rating (MW)	Owner's Emergency Rating (MW)	Most Limiting Element
ST1	81.6	81.6	Generator @ p.f.=0.85
ST2	204.0	204.0	Generator @ p.f.=0.85
ST3	204.0	204.0	Generator @ p.f.=0.85
GT1	11.5	11.5	Generator @ p.f.=0.85
GT3	78.8	78.8	Generator @ p.f.=0.9
GT4	60.5	60.5	Generator @ p.f.=0.85

Generator ratings are determined in accordance with EIA methods based on nameplate MVA and power factor. These ratings are only indicative of the generator and equipment manufacturer's stated electrical capability. They do not reflect the megawatt producing capability of the plant. These limits do however include the assessment of other equipment localized to each generating unit; and the most limiting Rating is the thermal limitations of each respective generator and associated equipment.

4.3 Overhead Conductors

The calculations for normal operating conditions use the design criteria of 75° C, and the emergency operating conditions use a conductor design temperature rating of 100° C. AEPCO incorporates the calculations used in the IEEE Standard 738, IEEE Standard for Calculating the Current-Temperature of Bare Overhead Conductors, in its analysis of determining the current-temperature relationship of its conductors, given the parameters noted in Table 2.

The ratings can be found in Table 2 below. The conductor ratings apply to the entire line, including the last span of the line entering a substation. The limiting factors of each transmission line are discussed in the next Section and a spreadsheet of AEPCO's transmission line ratings can be found in Appendix A, AEPCO Transmission Line Ratings.

The updated conductor ratings have also been done to calculate year-round 15-minute, 30-minute and 4-hour emergency ratings, using an Excel-based program to produce a loading guide for each conductor, based on the IEEE Standard 738. The same parameters noted in Table 2 below were used to calculate these emergency ratings.

The 15-minute and 30-minute emergency ratings will be utilized by System Operations in their Dispatch Center where contingency overloads can be mitigated within 15 to 30 minutes.

[6] FAC-008-3 R1

The values for the 4-hour emergency ratings (often referred as just the Emergency rating) for all conductors below are based on 130% of the normal ratings. The uniform increase of 30% in Emergency rating over normal rating was chosen conservatively as the lowest ratio obtained in normal and emergency rating calculations for different types of conductors. It should be noted that the 15-minute and 30-minute emergency ratings for the smaller conductors, #2 CU to 636 ACSR, are the same as the 4-hour emergency rating. For conductor sizes 795 AAC and up, three emergency rating values may be applicable including 15-minute, 30-minute and 4-hour ratings. The 15-minute ratings are 140% of normal and the 30-minute ratings are 135% of normal.

4.3.1 Table 2: Conductor Thermal Ratings

At 75° C Operating Temperature Based on 4 ft. per second Wind Velocity and 40° C Air Temperature 15-Minute, 30-Minute and 4-Hour Ratings are same for smaller conductors to 636 ACSR 15-Minute, 30-Minute and 4-Hour Ratings listed below for conductors 795 AAC & Up			
ACSR/AAC Conductor		Copper Conductor	
SIZE	AMPS (Normal/Emergency)	SIZE	AMPS (Normal/Emergency)
1/0 – 105.7 ACSR	239/311	#2 – 3 Strand	235/306
2/0 – 133.0 ACSR	274/356	#2 – 7 Strand	228/296
3/0 – 167.7 ACSR	314/408	4/0 – 211.6 MCM	476/619
4/0 – 211.6 ACSR	361/469	350 MCM	653/849
266.8 ACSR	451/586		
336.4 ACSR	522/679		
397.5 ACSR	580/754		
477 AAC	631/820		
477.0 ACSR	652/848		
556.0 ACSR	718/933		
636.0 ACSR	781/1015		
795.0 AAC	870/1218/1175/1131		
795.0 ACSR	899/1259/1214/1169		
954.0 AAC	974/1364/1315/1266		
954.0 ACSR	989/1385/1335/1286		
2 – 954 ACSR	1978/2769/2670/2571		
1033.5 ACSR	1040/1456/1404/1352		
1192.5 ACSR	1135/1589/1532/1476		
1272.0 AAC	1164/1630/1571/1513		
1272.0 ACSR	1182/1655/1596/1537		
1351.5 ACSR	1228/1719/1658/1596		
1590.0 ACSR	1359/1903/1835/1767		
2167.0 ACSR	1624/2274/2192/2111		

The parameters upon which the conductor ratings are based are found in Table 3 below:

4.3.2 Table 3: Conductor Rating Modeling Parameters

Parameters Common to All Locations/Conductors		
Parameter	Continuous Rating	Emergency Rating
Wind Direction	70° to Line	70° to Line
Emissivity	0.7	0.7
Absorptivity	0.8	0.8
Date	July 1	July 1
Time	4 PM	4 PM
Latitude	32.5° North	32.5° North
Elevation	2500 Ft	2500 Ft
Solar Input	Clear	Clear
Allowable Cond. Temp (ACSR)	75° C	100° C or sag limit
Wind Speed	4 ft/s	4 ft/s
Ambient Temperature	40° C	40° C

The following items are pertinent with regard to the current conductor rating method:

a. The thermal ratings from Table 2, used by AEPCO to rate its transmission lines, are considered to be conservative. The emergency ratings are set at 130% of the normal rating based on ratings developed for each transmission line according to IEEE Standard 738. If through internal studies it is determined that a line will become stability limited, (at a value lower than the thermal limit) its rating will be based on its particular stability limit.
b. The weather parameters for development of the existing conductor thermal ratings are based on the values for wind direction, absorptivity, and wind speed as noted in Table 3. The conductor ratings are based on a 75° C operating temperature with a 4 feet per second wind speed and a 40° C air temperature. Emergency ratings, as shown in Appendix A, are based on a 100° C operating temperature with a 4 feet per second wind speed and a 40° C air temperature.

c. Rigid Bus and Strain Bus design are determined by the Rural Utilities Service (RUS) Design Guide for Rural Substations Bulletin 1724E-300 (Bulletin) and National Electric Safety Code (NESC) as a minimum. For new 115 kV substations, AEPCO uses a standard schedule 40 aluminum pipe conductor size of 3-inch and for new 230 kV substations, AEPCO uses an aluminum pipe conductor size of 4-inch. There is currently no case on the AEPCO system where the rigid bus or strain bus is a limiting factor for any of AEPCO's transmission line ratings. The ratings of the Aluminum rigid bus or pipe conductor are based on IEEE Standard 605-1998 IEEE Guide for Design of Substation Rigid-Bus Structures, using an emissivity of 0.5, with Sun, at a 40° C temperature rise above 40° C Ambient for normal operating conditions, and a 60° C temperature rise above 40° C Ambient for emergency operating conditions.

4.4 Transmission Line Ratings

Appendix A contains a summary table for the transmission line ratings that take into account the most limiting applicable equipment rating. The Summary table include the most limiting and second most limiting elements. The Summary table is followed by tables that show the individual rating of components that make up each transmission line. Currently, there are not operating limitations in effect as of the date of this revision. Any such limitations will be posted on the AEPCO OASIS. Specific items that are marked "N/A" mean that the facility in question is a legacy facility for which no specific data exists or the facility belongs to another entity that has not provided the requested information. The summary table allows for the finding of the most limiting factor of a transmission line, as well as the next most limiting factor.

AEPCO ensures that its transmission line ratings are aligned with current design tolerances based on NESC and likewise ensures that actual field conditions do not create a situation that may cause the facilities to be non-compliant with the NESC clearance requirements.

Based on historical, conservative design practices, AEPCO has incorporated additional design margins to compensate for minor variations between design conditions and actual field conditions. In addition, AEPCO verifies its "as-built" conditions by scheduled field visits. Each line segment part of the BES is monitored on an annual basis. AEPCO's current maintenance practices include an annual inspection on concrete and steel structures and a semi-annual inspection on wood structures. Inspections are performed by a journeyman hot stick lineman inspector who has been trained and provided the information to identify problems of a structural nature as well as phase-to-ground clearance issues. The inspector will note changes in field conditions, such as new structures, tree growth, etc. In addition, the inspector has been trained in the use of measuring devices to determine pole integrity and phase-to-ground clearances. The inspection is a visual inspection designed to monitor the integrity, reliability, and compliance with NESC standards checking minimum conductor sag distances at key points throughout the system.
Findings are documented, reported, and addressed as issues arise. In addition to on-ground line inspections, AEPCO also performs regular aerial bucket or climbing inspections in high-risk areas outlined in AEPCO's Transmission Vegetation Management Plan (TVMP).

4.5 Transformers

AEPCO owns the following types of power transformers:

a. Load serving transformers with LTC
   -Conventional
   -Auto
b. Tie Autotransformers

The Normal and Emergency Ratings for terminal equipment are determined as follows:

4.5.1 Table 4: Transformer Ratings

Equipment	Normal Rating	Emergency Rating ½ Hour Maximum Overload
AEPCO Transformers	100% Manufacturer's highest Nameplate Rating @ 55° C or 65° C rise	125% of Manufacturer's Nameplate Rating @ 55° C or 65° C rise

During All Lines In Service (ALIS) operation, the loading of the transformer should not exceed the normal rating. During system contingencies, the loading of the transformer should not exceed its Emergency Rating, which is set at 125% of the normal rating based on ratings developed for each transformer according to IEEE Std. C57.91-1995, Guide for Loading Mineral-Oil-Immersed Transformers. AEPCO can exceed its normal ratings for up to 30 minutes. In addition, AEPCO follows applicable Transmission Relay Loadability criteria listed within NERC Reliability Standard PRC-023-4 which limits the ability of automatic protection equipment to de-energize transformers. This allows time to permit operator intervention and helps avoid potential system cascading. Under special circumstances, AEPCO may wish to evaluate other sources in regard to manufacturer's specifications, such as the latest applicable versions of IEEE Standard C57.15.12.00-2010, IEEE Standard for General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers, and IEEE Std. C57.119-2001, IEEE Recommended Practice for Performing Temperature Rise Tests on Oil-Immersed Power Transformers at Loads Beyond Nameplate Ratings. Appendix B contains a summary table of AEPCO transformer data including the ratings as discussed in this Section.

Some transformers on the AEPCO system are owned by other entities or co-owned by AEPCO and other entities. Appendix B lists these specific transformers and notes the operating agent responsible for the transformer ratings. For all jointly owned Facilities, AEPCO will follow the operating agent's methodology, unless otherwise agreed.

4.6 Relays

No AEPCO BES Facilities have ratings that are limited by protection or monitoring devices. AEPCO's relays will not trip (trip on Zone 3/Zone 4) due to normal or emergency load current (see NERC Reliability Standard PRC-023-4). New facilities and protection schemes are reviewed by AEPCO to ensure that loadability requirements are met.

4.7 Terminal Equipment (Breakers, Switches, etc.)

Power Circuit Breakers will be rated according to the manufacturer's nameplate ampacity at the nominal applied voltage. Normal and Emergency Ratings will be identical. This is in accordance with IEEE C37.010-1999 (R2005), IEEE Application Guide for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis, and IEEE C37.06, IEEE Standard for Switchgear – AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis – Preferred Ratings and Related Required Capabilities.

Power Circuit Switchers will be rated according to the manufacturer's nameplate ampacity at the nominal applied voltage. Normal and Emergency Ratings will be identical.

Air Disconnect Switches will be rated according to the manufacturer's nameplate ampacity at the nominal applied voltage. Normal and Emergency Ratings will be identical. This is in accordance with IEEE C37.30, IEEE Standard Requirements for High-Voltage Switches, and IEEE C37.37a-1996, IEEE Standard Loading Guide for AC High-Voltage Air Switches Under Emergency Conditions.

Current Transformers as installed on the AEPCO system are primarily Bushing Current Transformers that are supplied with power transformers and circuit breakers. These will be rated according to the corresponding unit's nameplate in accordance with IEEE C57.13-2008, IEEE Standard Requirements for Instrument Transformers. A thermal rating factor will be applied to the normal and emergency ratings as provided by the manufacturer or developed based on industry practice. Normal and Emergency Ratings will be identical. Under certain circumstances, AEPCO may wish to evaluate other sources in regard to manufacturer specifications, such as increasing a thermal rating factor for a legacy bushing current transformer.

For the purposes of AEPCO's line limits evaluation, CT settings are not considered. The nominal nameplate primary ratings all exceed the current line limits. According to IEEE C37.110, for C class CTs, the secondary voltage that the CT will deliver when it is connected to a standard secondary burden, at 20 times the rated secondary current, without exceeding a 10% ratio error. This margin gives the necessary accuracy to allow all protective devices to function appropriately on AEPCO's system without going into significant saturation.

There are very few freestanding current transformers on the AEPCO system, but they are also rated according to the corresponding unit's nameplate in according with IEEE C57.13-2008.

The Normal and Emergency Ratings for terminal equipment are determined as follows:

4.7.1 Table 5: Terminal Equipment Ratings (Breakers, Switches, etc.)

Equipment	Normal Rating	Emergency Rating
Power Circuit breakers	100% of Manufacturer's Nameplate Rating	100% of Manufacturer's Nameplate Rating
Power Circuit switchers	100% of Manufacturer's Nameplate Rating	100% of Manufacturer's Nameplate Rating
Air Disconnect switches	100% of Manufacturer's Nameplate Rating	100% of Manufacturer's Nameplate Rating
Current transformers	100% of Manufacturer's Nameplate Rating	100% of Manufacturer's Nameplate Rating

Additional applicable IEEE standards will be consulted as deemed necessary regarding the rating of its terminal equipment. Appendix C, AEPCO Power Circuit Breaker & Circuit Switcher Ratings, and Appendix D, Substation Switch Ratings, contain the summary tables for AEPCO terminal equipment ratings.

4.8 Compensation Devices

a. Shunt compensations

Shunt capacitors will be rated according to the manufacturer's nameplate ampacity and in accordance with IEEE 18-2012, IEEE Standard for Shunt Power Capacitors. Appendix E, Shunt Capacitor Ratings, contains a summary table for AEPCO shunt capacitor ratings. The normal and emergency ratings for shunt compensation devices will be identical as follows:

Equipment	Normal Rating	Emergency Rating
Shunt Capacitors	100% of Manufacturer's Nameplate Rating	100% of Manufacturer's Nameplate Rating

b. Series compensation

AEPCO has no series compensation devices on its system.

5 Establishment and Communication of Facility Ratings

AEPCO establishes BES Facility ratings in accordance with this document. AEPCO submits its most up-to-date ratings as part of the WECC base case preparation process on a periodic basis as required by WECC. GE PSLF Power flow Model, includes tables of the AEPCO power flow modeling data with corresponding normal and emergency equipment ratings.

Within 21 calendar days of receipt of a request for documentation for determining its Facility Ratings and its Facility Ratings methodology for inspection and technical review by the RC, WAPA-DSW and other Transmission Operators and Transmission Planners that work within the same Transmission Planning Area.[7]

Within 45 calendar days of receipt of documented comments on its technical review of the AEPCO's Facility Ratings methodology or documentation for determining its Facility Ratings from the above RC, WAPA-DSW, Transmission Operator and Transmission Planner AEPCO will provide a response to that commenting entity.[8]

Within 30 calendar days (or a later date if specified by a requestor) for any requested Facility with a Thermal Rating that limits the use of Facilities under a requestor's authority by causing any of the following: 1) An Interconnection Reliability Operating Limit, 2) A limitation of Total Transfer Capability, 3) An impediment to generator deliverability, or 4) An impediment to service to a major load center, AEPCO shall identify the existing next most limiting equipment of the Facility and the Thermal Rating for that most limiting equipment.[9]

When AEPCO has determined that updated ratings are applicable, it will communicate those ratings as part of the WECC base case preparation process as appropriate and also communicate those new or modified facilities ratings to its associated Reliability Coordinator(s), Planning Coordinator(s), Transmission Planner(s), Transmission Owner(s) and Transmission Operator(s) as scheduled by such requesting entities as appropriate. AEPCO will keep all superseded portions of its Facility Ratings Methodology, and any modifications to this document that were in force since its last compliance audit. AEPCO will keep all other related documentation determining that its Facility Ratings are consistent with this methodology and associated responses to requested information from applicable entities for the audit period: [10]

[7] FAC-008-3 R4
[8] FAC-008-3 R5
[9] FAC-008-3 R1.2, R8.2
[10] FAC-008-3 R6, R7, R8.1

a. AEPCO shall establish SOLs as directed by the RC for its portion of the RC Area (excluding MWD BES Facilities) that are consistent with the RC's SOL Methodology for the Operations Horizon.[11]

b. AEPCO shall establish SOLs for its Transmission Planning Area that are consistent with the Western Area Power Administration (WAPA) SOL Methodology for the Planning Horizon.[12]

c. AEPCO will utilize SOLs established by the CAISO for MWD's BES Facilities in the CAISO Transmission Planning Area that are consistent with the CAISO SOL Methodology for the Operating and Planning Horizon. [13]

d. SOL studies performed shall use WECC-approved base cases reflecting anticipated system conditions.

e. SOLs shall be derived from computer simulations/models, technical limitations, contract rights on jointly owned and third party systems, and Facility Ratings.

f. The facilities addressed in this document include, but are not limited to, transmission conductors, transformers, relay protective devices, terminal equipment, and series and shunt compensation devices.

g. The methodology criteria addressed Normal and Emergency ratings for the facilities that comprise AEPCO's BES.

h. In the pre-Contingency and post-Contingency states (system normal and emergency conditions), the BES must demonstrate transient, dynamic and voltage stability.

[11] FAC-014-2 R2
[12] FAC-014-2 R4
[13] FAC-014-2 R4

AEPCO shall communicate its SOL Methodology, and any changes to the Methodology, to the RC, WAPA-DSW, other TOPs, and Transmission Service Providers that work within its Transmission Planning Area, and share its information with adjacent TPs. The Transmission Operator shall provide any SOLs it developed to its Reliability Coordinator and to the Transmission Service Providers that share its portion of the Reliability Coordinator Area.[14]

For the MWD 230 kV facilities for which AEPCO acts as the TOP, CAISO conducts operational studies in accordance with the applicable NERC/WECC Reliability requirements, CAISO Tariff and Business Practice Manual provisions applicable to the TOP function including the establishment and communication of SOLs.[15] The results of these studies are communicated to AEPCO for inclusion in the Seasonal, Day-Ahead and Current Day operational plans.

CAISO will communicate the SOLs for the MWD BES Facilities to the RC.

[14] FAC-014-2 R5, R5.2, R5.4

[15] Operating Agreement between The Metropolitan Water District of Southern California and the California Independent System Operator Corporation dated July 3, 2017.

APPENDIX A
Transmission Line Ratings

AEPCO Transmission Line Limits

Sub From	Sub To	Volt	Normal Limit	Emergency Limit	Normal Limit	Emergency Limit	Limit Element	Next Element Norm/Emrg	Next Limit Norm/Emrg
		KV	AMP	AMP	MVA	MVA			AMP
HASSAYAMPA	PINAL WEST	500	3896	4480	3374	3880	Conductor	Cond/Breaker	4551/5000
PINAL WEST	HASSAYAMPA	500	3896	4480	3374	3880	Conductor	Cond/Breaker	4551/5000
GREEN-SW	GREENLEE	345	1978	2000	1182	1195	Conductor	Switch	2000
GREENLEE	GREEN-SW	345	1978	2000	1182	1195	Conductor	Switch	2000
BICKNELL	VAIL	345	1600	1600	956	956	Switch	Conductor	1978/2571
VAIL	BICKNELL	345	1600	1600	956	956	Switch	Conductor	1978/2571
PINAL WEST	VAIL	345	2000	2000	1195	1195	Term. Eq.	Breaker	2380
VAIL	PINAL WEST	345	2000	2000	1195	1195	Term. Eq.	Breaker	2380
PINAL WEST	WESTWING	345	2000	2000	1195	1195	Term. Eq.	Breaker	2000
WESTWING	PINAL WEST	345	2000	2000	1195	1195	Term. Eq.	Breaker	2000
DOSCONDO	HACKBERRY	230	1164	1200	464	478	Conductor	Cond/TermEq	1182/1200
HACKBERRY	MORENCI	230	1164	1513	464	603	Conductor	Conductor	1182/1537
GREEN-SW	MORENCI	230	1182	1537	471	612	Conductor	Switch	1600
MORENCI	PD-MORNC	230	989	1286	394	512	Conductor	Conductor	1182/1537
APACHE	BUTERFLD	230	899	1169	358	466	Conductor	Conductor	989/1286
BUTERFLD	APACHE	230	899	1169	358	466	Conductor	Conductor	989/1286
APACHE	RED TAIL	230	1182	1200	471	478	Conductor	Switch	1200
RED TAIL	APACHE	230	1182	1200	471	478	Conductor	Switch	1200
APACHE	WINCHESTER	230	1182	1537	471	612	Conductor	Switch	1600
WINCHESTER	APACHE	230	1182	1537	471	612	Conductor	Switch	1600
BUTERFLD	PANTANO	230	899	1169	358	466	Conductor	Switch	1200
PANTANO	BUTERFLD	230	899	1169	358	466	Conductor	Switch	1200
BUTERFLD	SAN RAF	230	989	1200	394	478	Conductor	Switch	1200
PANTANO	NEWTUCSN	230	899	1169	358	466	Conductor	Switch	1600
NEWTUCSN	PANTANO	230	899	1169	358	466	Conductor	Switch	1600
NEWTUCSN	SAHUARITA	230	899	1169	358	466	Conductor	Cond/R.Bus	1182/1217
SAHUARITA	NEWTUCSN	230	899	1169	358	466	Conductor	Cond/R.Bus	1182/1217
SAHUARITA	BICKNELL	230	899	1169	358	466	Conductor	R.Bus	1217
BICKNELL	SAHUARITA	230	899	1169	358	466	Conductor	R.Bus	1217
RED TAIL	DOSCONDO	230	1182	1200	471	478	Conductor	Switch	1200
DOSCONDO	RED TAIL	230	1182	1200	471	478	Conductor	Switch	1200
DAVIS	RIVIERA	230	1182	1200	471	478	Conductor	Switch	1200
APACHE	HAYDENAZ	115	631	820	126	163	Conductor	Conductor	652/847
HAYDENAZ	APACHE	115	631	820	126	163	Conductor	Conductor	652/847
MARANA	MARANATP	115	718	800	143	159	Conductor	Switch	800
MARANATP	MARANA	115	718	800	143	159	Conductor	Switch	800
MARANA	AVRA	115	870	1131	173	225	Conductor	Cond/Switch	1182/1200
AVRA	MARANA	115	870	1131	173	225	Conductor	Cond/Switch	1182/1200
AVRA	SANDARIO	115	870	1131	173	225	Conductor	Conductor	899/1169
SANDARIO	AVRA	115	870	1131	173	225	Conductor	Conductor	899/1169
SANDARIO	THREEPNT	115	361	469	72	93	Conductor	Conductor	899/1169
THREEPNT	SANDARIO	115	361	469	72	93	Conductor	Conductor	899/1169
BICKNELL	THREEPNT	115	652	848	130	169	Conductor	Conductor	899/1169
THREEPNT	BICKNELL	115	652	848	130	169	Conductor	Conductor	899/1169
THREEPNT	VALENCIA	115	652	848	130	169	Conductor	Conductor	899/1169
PANTANO	KARTCHNR	115	652	848	130	169	Conductor	Conductor	899/1169
VALENCIA	CAWCD	115	1200	1200	239	239	Switch	R.Bus	1623

1) SRP is the operating agent for the Hassayampa to Pinal West 500 kV line and has determined its line ratings. SWTC owns 7.305% of this line.
2) TEP is the operating agent for Pinal West to Vail and Pinal West to Westwing 345 kV lines and have determined their line ratings. SWTC owns 24% of these lines.
3) Dos Condados to Hackberry to Morenci 230 kV Lines limited by 1272 AAC conductor.
4) Davis to Riviera 230 kV line limited by 1272 ACSR Conductor Normal Conditions and limited by 1200A disconnect switch Emergency Conditions.
5) Apache to Hayden 115 kV Line limited by 477 AAC conductor at Apache (SWTC Rating) and Hayden (SRP Rating).
6) Marana to Avra and Avra to Sandario 115 kV Lines limited by 795 AAC conductor at Avra.
7) AEPCO is the TO for the Valencia to Spreader Tie line with 50% ownership with CAP and 65% capacity. Conductor is 954 ACSS.
8) CTs are not considered as limiting elements since they will continue to operate with over 90% ratio accuracy up to 20 times rated secondary current

Arizona G&T Cooperatives

Touchstone Energy® Cooperatives

TECHNICAL STUDY REPORT

2022 – 2031
Docket No. E-99999A-21-0009

January 2022

ARIZONA ELECTRIC POWER COOPERATIVE, INC.

TEN-YEAR TRANSMISSION PLAN

2022 – 2031

Prepared for the

ARIZONA CORPORATION COMMISSION

Docket No. E-99999A-21-0009

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ARIZONA ELECTRIC POWER COOPERATIVE, INC.

TEN-YEAR PLAN

2022 – 2031

TECHNICAL STUDY REPORT

Introduction

This technical report is being submitted to the Arizona Corporation Commission (ACC) pursuant to the Arizona Revised Statutes (A.R.S.) §40-360.02.C.7, and Decision No. 63876, dated July 25, 2001, regarding the Biennial Transmission Assessment prepared by Commission Utilities Division Staff.

Each year, Arizona Electric Power Cooperative, Inc. (AEPCO) performs an annual assessment of its interconnected transmission system in accordance with the North American Reliability Corporation (NERC) Transmission Planning Standards (TPL). Power flow analyses used for this report were performed in accordance with the NERC criteria for Planning Standard TPL-001-4, WECC-CRT-3.2, and AEPCO criteria consistent with the AEPCO 2020 Transmission Planning Assessment Report that details study results for the years 2021 through 2030. As required by the Standards, AEPCO's transmission system was analyzed within the near-term planning horizon (2022-2026) and the long-term planning horizon (2027-2031). Peak loading conditions were studied with a complete Power flow analysis for all years of the 2022- 2031 planning horizon. Additionally, for the years 2023 and 2031, a transient stability analysis was performed as well as a short circuit analysis, for the year 2022. The results of these analyses will be located in the appendices of this report.

The Ten-Year Transmission Plan document defines the projects included in this Technical Study Report as presented below. The following projects in-service dates were redefined in this analysis as required to meet the reliability criteria. Newly projected in-service dates determined in this analysis are identified below:

2022 – Schieffelin/Boothill Project
2022 – Thornydale to Saguaro 115 kV Interconnection
2023 – Thornydale to Saguaro 115 kV Loop-in to Adonis Substation
2024 – Thornydale to Marana115 kV Interconnection
2024 – Marana Substation Rebuild

Additional studies may be used to refine the newly projected in-service dates used in this plan, and/or suggest the need for reactive support to the AEPCO system. Any adjustments that have been determined a requirement will be reported in the following years ten-year plan filing.

The analyses performed for this study have been completed using the latest 2020 AEPCO load forecast, in line with the AEPCO Annual Transmission System Assessment analysis performed prior.

The results of this analysis show that under a variety of outage conditions, and with the inclusion of planned projects, AEPCO's system will perform sufficiently with no violations of the NERC reliability criteria.

Study Assumptions

Power flow studies were performed using General Electric's (GE) Positive Sequence Load Flow (PSLF) program. The power flow study cases were created for each year in the 2022-2031 study period, using the latest Arizona coordinated cases that were developed from Western Electricity Coordinating Council (WECC) approved base cases.

Case Development and Modeling

The study cases for this 2022 ACC Ten-Year Plan were developed from coordination with Arizona utilities (AZCC). Case development descriptions are as follows:

- 2022 – Developed from 2023 AZCC Heavy Summer Case
- 2023 – 2023 AZCC Heavy Summer Case
- 2024 – Developed from 2026 AZCC Heavy Summer Case
- 2025 – Developed from 2026 AZCC Heavy Summer Case
- 2026 – 2026 AZCC Heavy Summer Case
- 2027 – Developed from 2026 AZCC Heavy Summer Case
- 2028 – Developed from 2026 AZCC Heavy Summer Case
- 2029 – Developed from 2031 AZCC Heavy Summer Case
- 2030 – Developed from 2031 AZCC Heavy Summer Case
- 2031 – 2031 AZCC Heavy Summer Case

These base cases include AEPCO loading levels based on the 2020 AEPCO load forecast, consistent with this year's Annual Transmission Planning Assessment analysis. Each of the individual study cases were assembled to match the forecasted peak loads corresponding to each case year.

It should be noted that the Anza Electric Cooperative, Inc. (Anza) load is not located in the southeastern Arizona area and is represented as a transfer with Western Area Lower Colorado (WALC) – Area 19.

The cases prepared for these studies include a conservative power factor for AEPCO's Distribution Cooperative Member systems of approximately 0.98 per unit.

Included Projects

Specific study scenarios were conducted with the addition of the planned projects as described in the Ten-Year Plan in order to meet the AEPCO system reliability criteria. The same or similar projects were included in the latest AEPCO 2021-2024 Construction Work Plan (CWP), and have a high likelihood of being advanced for approval and construction in a subsequent CWP. The inclusion of the modeled planned projects are as follows:

Project Descriptions:

- **Marana Capacitor Bank:** Installation of a 14.4 MVAR capacitor bank at the Marana 115 kV Substation **(2022)**
- **Schieffelin Project:** Schieffelin Substation with a 230/69 kV transformation to the Sulphur Springs Valley Electric Cooperative, Inc.'s (SSVEC) distribution system, along with an interconnection to Arizona Public Service's (APS) Boothill Substation. **(2022)**
- **Thornydale - Adonis - Saguaro Interconnection:** 115 kV line between AEPCO's Thornydale Substation and to APS' Saguaro Substation **(2022).** Followed by the construction of AEPCO's Adonis Substation, with loop-in from the Thornydale – Saguaro 115 kV line. **(2023)**
- **Thornydale – Marana Connection:** 115 kV line between AEPCO's Thornydale Substation and Marana Substation **(2024)**
- **Marana Substation Rebuild:** Rebuild of AEPCO's Marana Substation to ring bus configuration with looped-in connection from WAPA's Electrical District 5 (ED5) – Rattlesnake 115 kV line. **(2024)**

Study Results

The results of this analysis are presented in the form of system plots and advanced result tables. This is due to an extremely large number of scenarios in consideration.

This analysis did not find any criteria violations, or scenarios in which voltage collapse or cascading would occur. The addition of planned projects are found to satisfy the study criteria in question. In some instances, additional operating procedures (i.e. curtailment of load) is required to satisfy stable conditions.

Appendix A contains simple one-line diagrams of AEPCO's transmission system.

The rationale behind the contingencies studied in the steady state analysis are included in **Appendix B**. As part of AEPCO's TPL Assessment, all P1, P2, and P6 outages of the AEPCO's High Voltage (HV) and Extra-High Voltage (EHV) outages were included in the contingency list. Contingency simulations for radial transmission lines have been excluded from this listing.

A steady state analysis was evaluated with the use of the GE PSLF program. The results of this analysis can be found in **Appendix C** of this report. These results include solution convergence reports, system voltage violation reports, and thermal loading violation reports.

A short circuit analysis was performed using ASPEN's One Liner model of the regional electric system, found in **Appendix D**. A short circuit current was calculated for each bus in AEPCO's system. When the modeled fault current is compared with the breakers manufacturer's specifications for interrupting capacity, it can be shown that the breakers in AEPCO's system are fully capable of interrupting the expected fault current likely to occur. This short circuit analysis was performed for the year 2022.

A transient stability analysis was performed with the use of the GE PSLF Stability program. The transient stability analysis is described in **Appendix E** and full plot results are available upon request.

ARIZONA ELECTRIC POWER COOPERATIVE, INC.

TEN-YEAR PLAN

2022 – 2031

Technical Study Report Appendices

Appendix A – System Diagrams

Figure 1

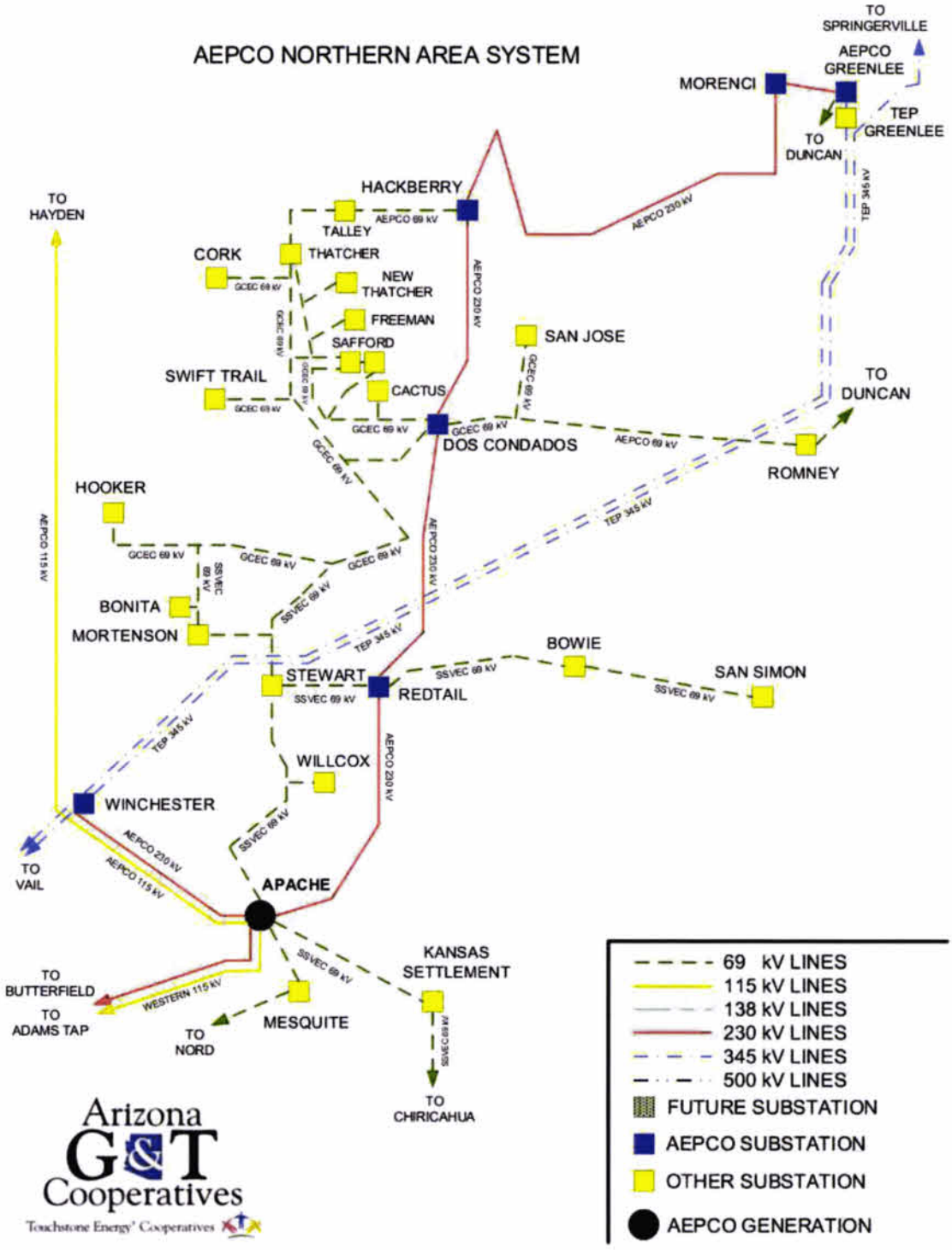

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Figure 2

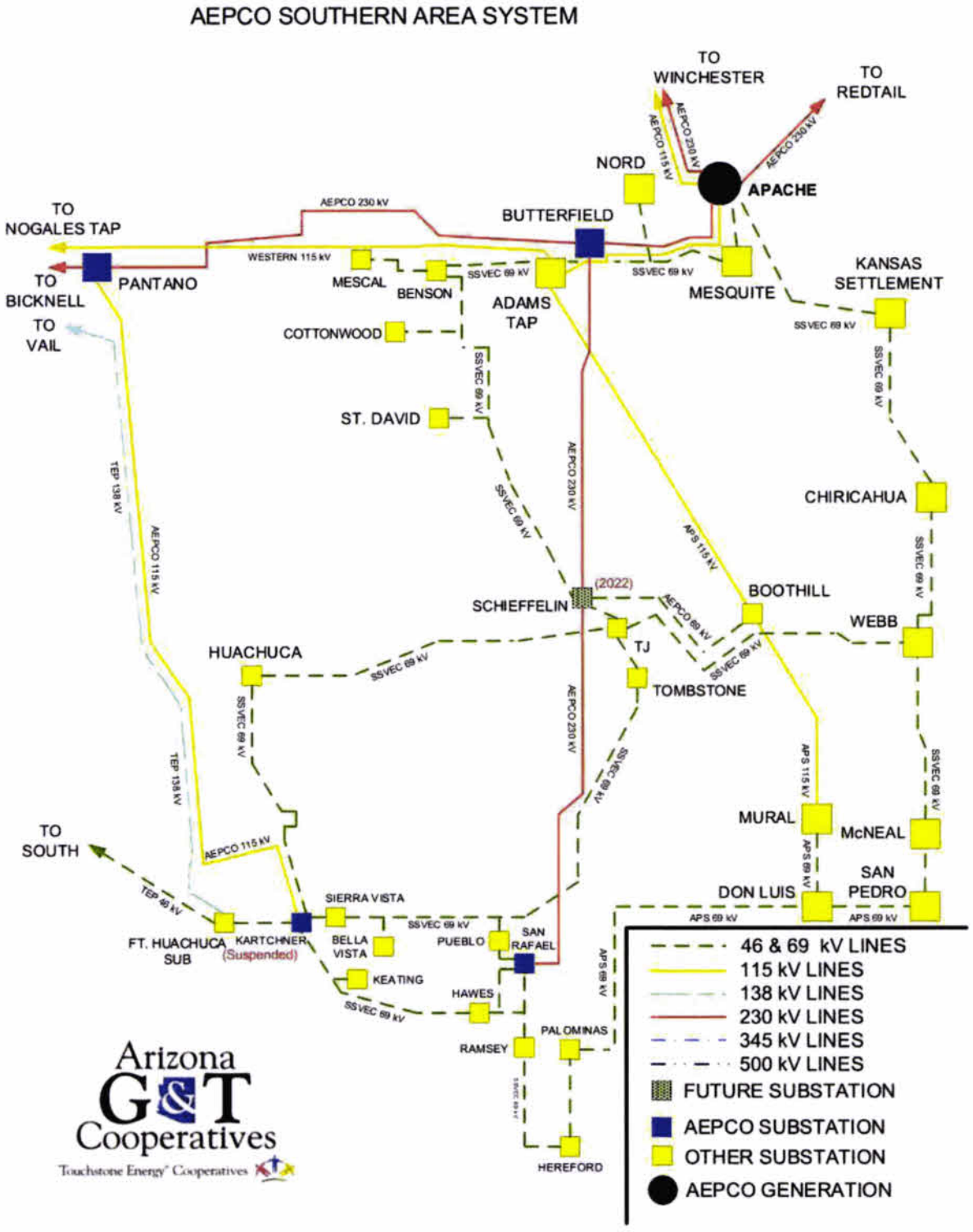

AEPCO SOUTHERN AREA SYSTEM
TO WINCHESTER
TO REDTAIL
NORD
APACHE
AEPCO 230 kV
AEPCO 115 kV
TO NOGALES TAP
TO BICKNELL
TO VAIL
PANTANO
BUTTERFIELD
WESTERN 115 kV
MESCAL
BENSON
SSVEC 69 kV
ADAMS TAP
MESQUITE
KANSAS SETTLEMENT
COTTONWOOD
ST. DAVID
CHIRICAHUA
TEP 138 kV
APS 115 kV
(2022)
SCHIEFFELIN
BOOTHILL
WEBB
TJ
TOMBSTONE
HUACHUCA
MURAL
McNEAL
SAN PEDRO
DON LUIS
APS 69 kV
TO SOUTH
TEP 46 kV
SIERRA VISTA
FT. HUACHUCA SUB
KARTCHNER (Suspended)
BELLA VISTA
PUEBLO
SAN RAFAEL
KEATING
HAWES
PALOMINAS
RAMSEY
HEREFORD
Touchstone Energy® Cooperatives
46 & 69 kV LINES
115 kV LINES
138 kV LINES
230 kV LINES
345 kV LINES
500 kV LINES
FUTURE SUBSTATION
AEPCO SUBSTATION
OTHER SUBSTATION
AEPCO GENERATION

Figure 3

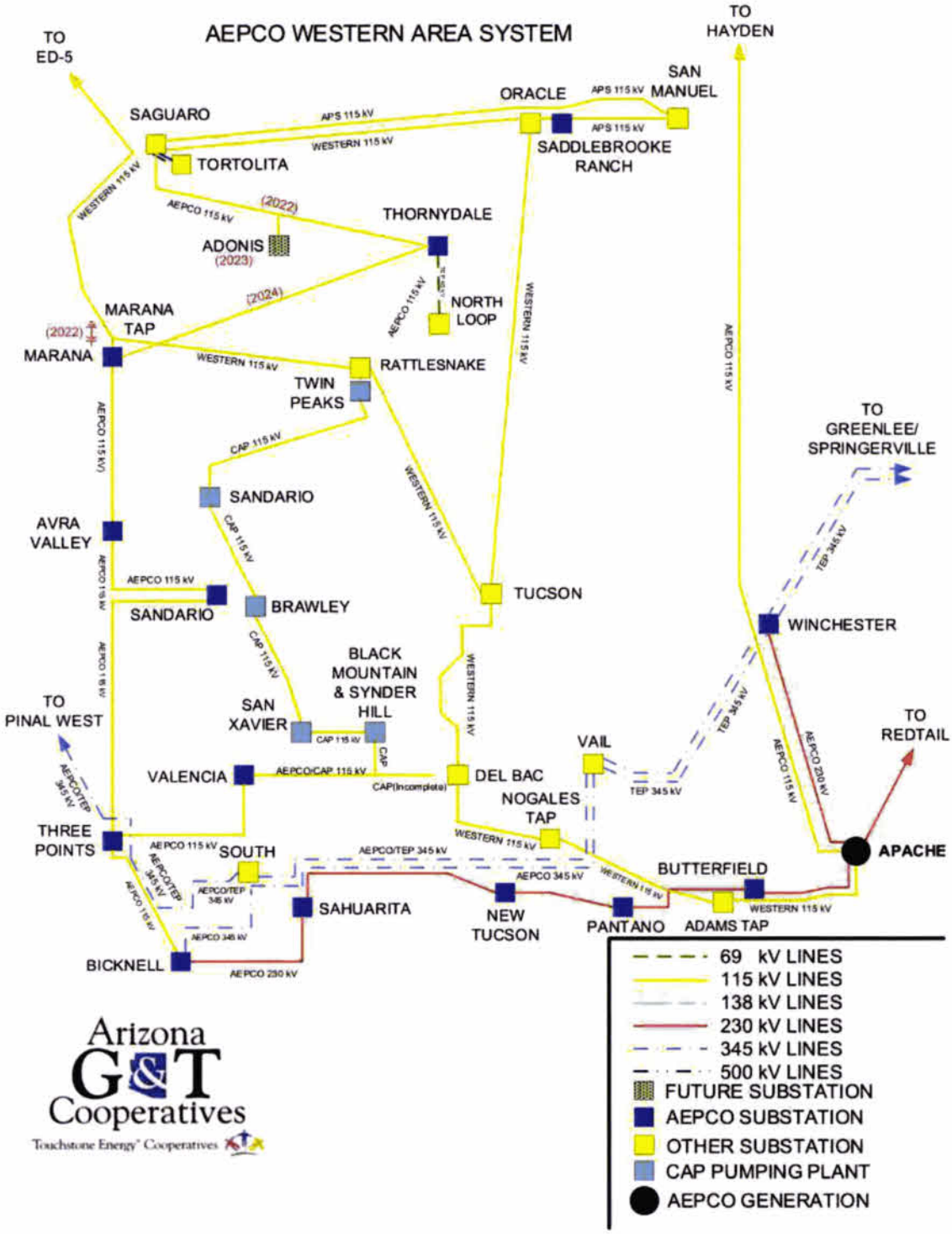
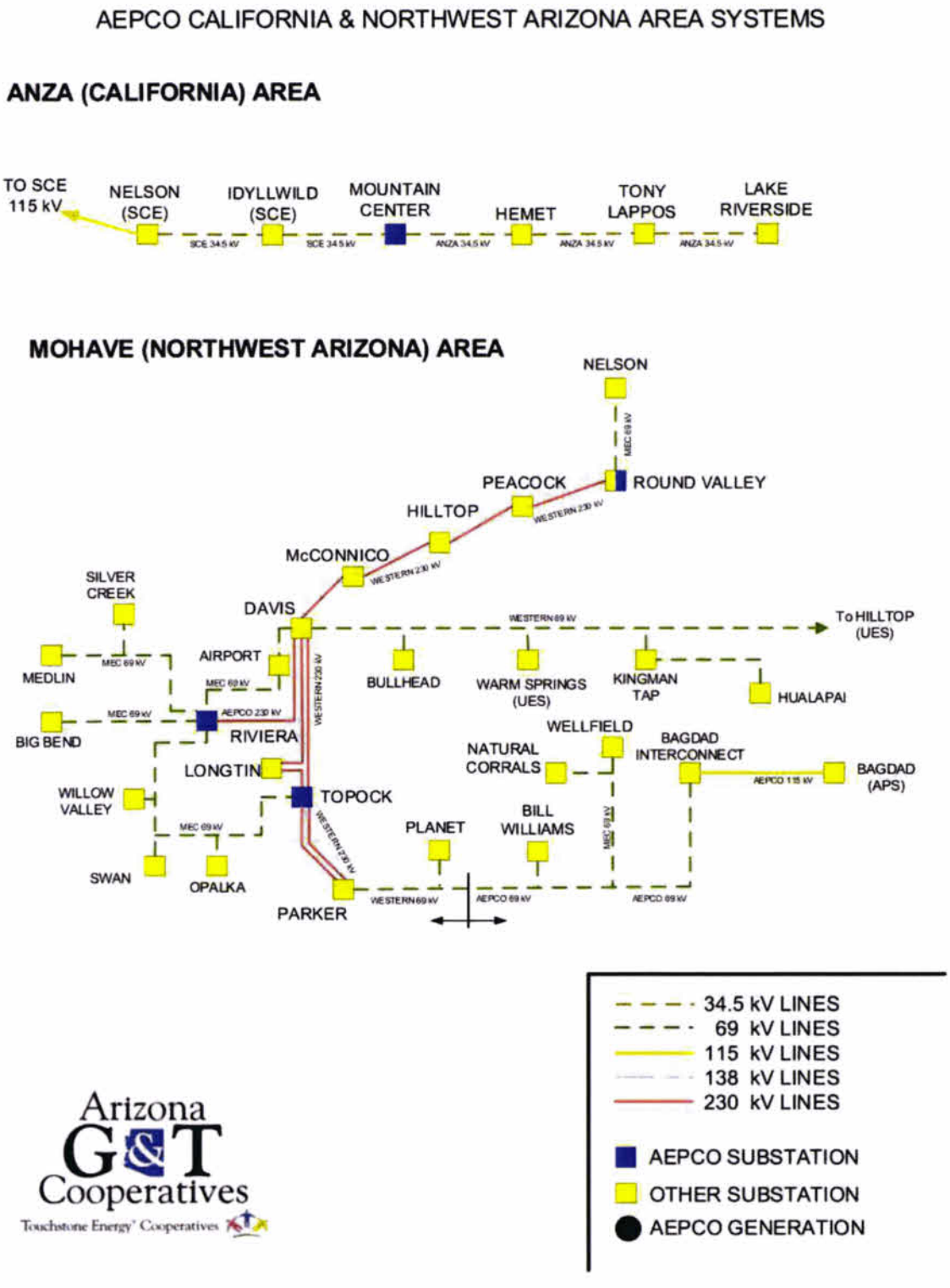

AEPCO WESTERN AREA SYSTEM
TO ED-5
TO HAYDEN
SAGUARO
TORTOLITA
ORACLE
SAN MANUEL
SADDLEBROOKE RANCH
APS 115 kV
WESTERN 115 kV
AEPCO 115 kV
(2022)
(2023)
(2024)
ADONIS
THORNYDALE
NORTH LOOP
MARANA TAP
MARANA
RATTLESNAKE
TWIN PEAKS
SANDARIO
BRAWLEY
AVRA VALLEY
TUCSON
TO GREENLEE/ SPRINGERVILLE
TEP 345 kV
WINCHESTER
TO REDTAIL
AEPCO 230 kV
BLACK MOUNTAIN & SYNDER HILL
SAN XAVIER
CAP 115 kV
CAP
TO PINAL WEST
AEPCO/TEP 345 kV
VALENCIA
AEPCO/CAP 115 kV
CAP(Incomplete)
DEL BAC
VAIL
NOGALES TAP
THREE POINTS
SOUTH
AEPCO/TEP 345 kV
AEPCO 345 kV
BUTTERFIELD
APACHE
SAHUARITA
NEW TUCSON
PANTANO
ADAMS TAP
BICKNELL
AEPCO 230 kV
69 kV LINES
115 kV LINES
138 kV LINES
230 kV LINES
345 kV LINES
500 kV LINES
FUTURE SUBSTATION
AEPCO SUBSTATION
OTHER SUBSTATION
CAP PUMPING PLANT
AEPCO GENERATION
Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Figure 4

AEPCO CALIFORNIA & NORTHWEST ARIZONA AREA SYSTEMS



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Appendix B – Steady State Contingency Events and Rationale

The contingency events simulated for each study year for the steady state analysis contains EHV (EHV – greater than 300 kV) Facilities and HV (300 kV and lower voltage systems) Facilities, in accordance with the NERC Bulk Electric System (BES) definition. The classification of system contingencies were performed according to the NERC TPL-001-4 Table 1 – *Steady State and Stability Performance Planning Events*.

Additionally, AEPCO coordinated with adjacent Transmission Planners to ensure that contingencies on adjacent systems which may impact AEPCO are included on the contingency list. Simulation events that belong to the adjacent systems, pertain only to the interconnected system in southeast Arizona and do not include remote systems or buses of the neighboring entities that have no connection to AEPCO and the surrounding interconnected transmission system.

It should be noted that AEPCO does not simulate the removal of additional elements as the result of protection systems and other automatic controls following a contingency. This omission is made because the events to which automatic transmission element tripping occurs is only with elements that feed load areas, thus cascading would not occur.

P0 – No Contingency (Steady State, All Lines In Service [ALIS] Scenario):

AEPCO studies its system with ALIS as its base case scenario.

P1 – Single Contingency (Loss of one of the following – Generator, Transmission Circuit, or Transformer):

As a matter of course, AEPCO considers all Category P1 contingencies on its transmission system, with the exception of radial transmission lines serving a single substation or load. This has been done to determine if the forecasted demands will impact any element on the AEPCO transmission system in the future.

Additionally, AEPCO considers certain Category P1 contingencies events of its interconnected neighboring utilities.

P2 – Single Contingency (Opening of a line section without a Fault, Bus Section Fault, or Internal Breaker Fault):

For Category P2 outages, AEPCO looks at its most critical internal breaker faults and bus section faults, which could result in the loss of critical transmission paths on AEPCO's transmission system.

P3 – Multiple Contingency (Loss of a Generator followed by another system element):

Due to the analysis of sensitivity scenarios in the TPL analysis, no Category P3 contingencies were evaluated. This decision was made as to avoid redundancy in the results. The sensitivity studies simulate outages in conjunction with adjustments to AEPCO's generation, placing generation output at both minimum and maximum levels. Thus, the loss of a generating unit followed by a system element was simulated within the scenarios where generation output was dispatched at minimum levels.

P4 – Multiple Contingency (Loss of multiple elements caused by a stuck breaker):

AEPCO simulated stuck breaker events using the same contingency list as used to simulate bus section faults and internal breaker failures (Category P2 contingencies). AEPCO determined that the loss of multiple elements due to a stuck breaker would be substantially identical to the contingency events studied for P2 events.

P5 – Multiple Contingency (Delayed Fault Clearing due to the failure of non-redundant relay):

AEPCO has endeavored to create a robust and stable system, as a result, all non-radial lines are covered by redundant relays, and thus no Category P5 outages are studied in AEPCO's analysis.

P6 – Multiple Contingency (Two overlapping singles):

AEPCO simulated double contingency outages on its system, taking into account all possible transmission line and transformer outage combinations (with the exception of radial transmission lines and transformers). Additionally, AEPCO has considered all impactful double contingency outages of its interconnected neighboring utilities.

P7 – Multiple Contingency (Common Structure):

AEPCO has only one P7 contingency in consideration (Loss of APACHE-WINCHESTER [230] | APACHE-HAYDENAZ [115] which is included in the P6 contingency list), thus simulating the only instance where the loss of two adjacent circuits on a common structure could occur within AEPCO's system.

Appendix C – Steady State Results

Solution Convergence Reports

Solution Report Summary				
Event	**Case Year(s)**	**Contingency**	**Result**	**Mitigation Plan**
P6	2022-2023	MARANA_Group [115] | THREEPNT-VALEN-AE[115], P6_1_1	Case Divergence	Resolved by Marana rebuild/ Saguaro-Marana project
P6	2022-2023	MARANA_Group [115] | CAP_Group [115], P6_1_1	Case Divergence	Resolved by Marana rebuild/ Saguaro-Marana project
P6	All	APACHE-BUTERFLD[230] | SAHUARIT-BICKNELL[230], P6_1_1	Case Divergence	System Restoration/Load Curtailment
P6	All	APACHE-BUTERFLD[230] | BICKNELL-BICKNELL[345/230], P6_1_2	Case Divergence	System Restoration/Load Curtailment
P6	All	APACHE-BUTERFLD[230] | BICKNELL-VAIL[345], P6_1_1	Case Divergence	System Restoration/Load Curtailment
P6	All	APACHE-BUTERFLD[230] | NEWTUCSN-SAHUARIT[230], P6_1_1	Case Divergence	System Restoration/Load Curtailment
P6	All	APACHE-BUTERFLD[230] | PANTANO-NEWTUCSN[230], P6_1_1	Case Divergence	System Restoration/Load Curtailment
P6	All	ADAMS_Group [115] | BUTERFLD-SCHIEFFELIN[230], P6_1_1	Case Divergence	System Restoration/Load Curtailment

Voltage Reports

- **No Voltage Violations O**

Thermal Loading Reports

Thermal Loading Report Summary				
Event	**Case Year(s)**	**Contingency**	**Result**	**Mitigation Plan**
P1	2023, 2029-2031	APACHE-BUTERFLD[230], P1_2	Overload of ADAMS-ADAMSTAP 115 kV Line (WALC)	Owner notified
P1	2022-2023, 2028-2031	APACHE-BUTERFLD[230], P1_2	Overload of BOOTHILL-ADAMS 115 kV Line (APS)	Owner notified
P1	All	BUTERFLD-SCHIEFFELIN[230], P1_2	Overload of ADAMS-ADAMSTAP 115 kV Line (WALC)	Owner notified
P1	All	BUTERFLD-SCHIEFFELIN[230], P1_2	Overload of BOOTHILL-ADAMS 115 kV Line (APS)	Owner notified

Appendix D – Short Circuit Analysis

The short circuit analysis portion of this assessment was performed for the year 2021. The results indicate AEPCO's circuit breakers are capable of interrupting expected fault currents from all fault types and do not exceed their equipment ratings. The table below indicates the maximum fault current at each bus following either a 3LG, 2LG, 1LG, or L-L fault.

Substation	kV	Maximum Fault Current (Amps)	Breaker Interrupt Rating (Amps)	%
APACHE	230	14159.6	40000	**35%**
APACHE	115	15358.5	40000	**38%**
APACHE	69	9948.2	19000	**52%**
AVRA	115	4493.8	40000	**11%**
BICKNELL	345	7555.9	40000	**19%**
BICKNELL	230	6006.9	40000	**15%**
BICKNELL	115	7994.7	20000	**40%**
BICKNELL	69	1465.4	19000	**8%**
BUTTERFIELD	230	7452.7	40000	**19%**
DOS CONDODOS	230	4713	40000	**12%**
DOS CONDODOS	69	8147.1	21000	**39%**
GREENLEE	230	5638.7	40000	**14%**
GREENLEE	345	10197.9	50000	**20%**
HACKBERRY	230	4820.7	40000	**12%**
HACKBERRY	69	9761.4	31500	**31%**
KARTCHNR	115	2443.9	40000	**6%**
KARTCHNR	69	4081.1	19000	**21%**
LONGTIN	69	6133.7	40000	**15%**
MARANA	115	5656.3	20000	**28%**
MORENCI	230	5249.1	40000	**13%**
NEW TUCSON	230	4764.2	40000	**12%**
PANTANO	230	4764.2	40000	**12%**
PANTANO	115	4461.8	20000	**22%**
REDTAIL	230	5877.2	40000	**15%**
REDTAIL	69	4755.9	21000	**23%**

Substation	kV	Maximum Fault Current (Amps)	Breaker Interrupt Rating (Amps)	%
RIVIERA	230	8695.6	20000	**43%**
RIVIERA	69	10586.3	19000	**56%**
SAHUARITA	230	5047.3	40000	**13%**
SAN RAFAEL	230	3094	40000	**8%**
SAN RAFAEL	69	6265.6	40000	**16%**
SANDARIO	115	4000.8	40000	**10%**
SCHIEFFELIN	230	4663	40000	**12%**
SCHIEFFELIN	69	9095.9	40000	**23%**
THREE POINTS	115	4820.3	40000	**12%**
TOPOCK	230	14628.1	40000	**37%**
TOPOCK	69	10459.4	40000	**26%**
VALENCIA	115	4027.4	40000	**10%**
WINCHESTER	230	9965.1	40000	**25%**

* Full Short Circuit result tables are available upon request.

Appendix E – Transient Stability Analysis

For the transient stability portion of this assessment, AEPCO performed studies simulating the Near-Term and Long-Term planning horizons (2023 Peak and 2031 Peak). The results of this analysis (Full plot results available upon request) found AEPCO's BES to meet performance requirements.

Contingency Events and Rationale

AEPCO created an additional contingency list for its transient stability analysis. The classification of these system contingencies were performed according to the NERC TPL-001-4 Table 1 – "*Steady State and Stability Performance Planning Events.*" The list contains contingencies which were identified to produce the most severe system impacts on AEPCO's portion of the BES.

The contingencies selected for this analysis are based around the major "nodes" relevant to AEPCO's portion of the BES. These "nodes" include locations such as interconnection points with adjacent entities and impactful locations near AEPCO's generation facilities. The list indicates the bus location of the simulated three-phase fault, as well as the subsequent contingency following a four-cycle clearing time. The complete list of contingencies simulated can be found on the following page.

1. **"Apache-Butterfield [230] P1_2"**
   Fault "APACHE 230"
   Line "APACHE 230" "BUTERFLD 230" "1"
2. **"Apache-Redtail [230] P1_2"**
   Fault "APACHE 230"
   Line "APACHE 230" "REDTAIL 230" "1"
3. **"Apache-Winchester [230] P1_2"**
   Fault "APACHE 230"
   Line "APACHE 230" "WINCHESTER 230" "1"
4. **"Marana Group [115] P1_2"**
   Fault "MARANA 115"
   Line "MARANATAP 115" "MARANA 115" "1"
   Line "MARANATAP 115" "ED-5 115" "1"
   Line "MARANATAP 115" "RATTLSNK 115" "1"
5. **"Bicknell [345/230], P1_3"**
   Fault "BICKNELL 345"
   Xfmr "BICKNELL 345" "BICKNELL 230" "1"
6. **"Greenlee [345/230], P1_3"**
   Fault "GREEN-AE 345"
   Xfmr "GREEN-AE 345" "GREEN-AE 230" "1"
7. **"Apache [69/115] P1_3"**
   Fault "APACHE 69"
   Xfmr "APACHE-AE 69" "APACHE 115" "1"
8. **" MainBusFault-Apache [115] P2_2"**
   Fault "APACHE 115"
   Xfmr "APACHE 230" "APACHE 115" "1"
   Xfmr "APACHE 230" "APACHE 115" "2"
   Xfmr "APACHE 115" "APACH-ST-1 13.8" "1"
   Gen "APACH-ST-1 13.8" "1"
   Xfmr "APACHE 115" "APACH-CT-3 13.8" "1"
   Gen"APACH-CT-3 13.8" "1"
   Xfmr "APACHE-AE 69" "APACHE 115" " "
   Line "APACHE 115" "HAYDENAZ 115" "1"
   Line "ADAMSTAP 115" "APACHE 115" "1"
   Line "ADAMSTAP 115" "NOGALES 115" "1"
   Line "ADAMS 115" "ADAMSTAP 115" "1

EXHIBIT AEPCO-5B

AEPCO TEN-YEAR PLAN FOR 2021 (JAN. 28, 2021)

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibit.

ORIGINAL

Cooperatives

Touchstone Energy® Cooperatives

January 21, 2021

Arizona Corporation Commission
DOCKETED

JAN 28 2021

DOCKETED BY

Docket Control
Arizona Corporate Commission
1200 West Washington Street
Phoenix, AZ 85007

RE: DOCKET NO ~~E-00000D-19-0007~~ E-99999A-21-0009

Pursuant to §40-360.02 of the Arizona Revised Statutes (ARS), please find an enclosed original and fourteen copies of Arizona Electric Power Cooperatives, Inc.'s (AEPCO) 2021-2030 Ten-Year-Plan.

Enclosed is an additional copy of the filing that the Company requests you date-stamp and return in the self-addressed stamped envelope for our files.

Sincerely,

Boris Tumarin
Transmission Planning Manager

c:Zachary Branum, ACC
Compliance, ACC
Shane Sanders, AEPCO

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AZ CORP COMMISSION
DOCKET CONTROL
2021 JAN 28 A 11:41

Arizona G&T Cooperatives

Touchstone Energy® Cooperatives

TECHNICAL STUDY REPORT

2021 – 2030

Docket No. E~~00000D-19-0007~~

99999A-21-0009

January 2021

ARIZONA ELECTRIC POWER COOPERATIVE, INC.

TEN-YEAR TRANSMISSION PLAN

2021 – 2030

Prepared for the

ARIZONA CORPORATION COMMISSION

Docket No. E-00000D-19-0007

TABLE OF CONTENTS

ARIZONA ELECTRIC POWER COOPERATIVE, INC.

TEN-YEAR PLAN

2021 – 2030

TECHNICAL STUDY REPORT

Introduction

This technical report is being submitted to the Arizona Corporation Commission (ACC) pursuant to the Arizona Revised Statutes (A.R.S.) §40-360.02.C.7, and Decision No. 63876, dated July 25, 2001, regarding the Biennial Transmission Assessment prepared by Commission Utilities Division Staff.

Each year, Arizona Electric Power Cooperative, Inc. (AEPCO) performs an annual assessment of its interconnected transmission system in accordance with the North American Reliability Corporation (NERC) Transmission Planning Standards (TPL). Power flow analyses used for this report were performed in accordance with the NERC criteria for Planning Standard TPL-001-4, WECC-CRT-3.2, and AEPCO criteria consistent with the AEPCO 2020 Transmission Planning Assessment Report that details study results for the years 2021 through 2030. As required by the Standards, AEPCO's transmission system was analyzed within the near-term planning horizon (2021-2025) and the long-term planning horizon (2026-2030). Peak loading conditions were studied with a complete Power flow analysis for all years of the 2021- 2030 planning horizon. Additionally, for the years 2022 and 2030, a transient stability analysis was performed as well as a short circuit analysis, for the year 2021. The results of these analyses will be located in the appendices of this report.

The Ten-Year Transmission Plan document defines the projects included in this Technical Study Report as presented below. The following projects in-service dates were redefined in this analysis as required to meet the reliability criteria. Newly projected in-service dates determined in this analysis are identified below:

2022 – Kartchner – Ft. Huachuca Interconnection
2022 – Schieffelin/Boothill Project
2022 – Thornydale to Saguaro 115 kV Interconnection
2023 – Thornydale to Saguaro 115 kV Loop-in to Adonis Substation
2024 – Thornydale to Rattlesnake 115 kV Interconnection
2024 – Marana Substation Rebuild

Additional studies may be used to refine the newly projected in-service dates used in this plan, and/or suggest the need for reactive support to the AEPCO system. Any adjustments that have been determined a requirement will be reported in the following years ten-year plan filing.

The analyses performed for this study have been completed using the latest 2019 AEPCO load forecast, in line with the AEPCO Annual Transmission System Assessment analysis performed prior.

The results of this analysis show that under a variety of outage conditions, and with the inclusion of planned projects, AEPCO's system will perform sufficiently with no violations of the NERC reliability criteria.

Study Assumptions

Power flow studies were performed using General Electric's (GE) Positive Sequence Load Flow (PSLF) program. The power flow study cases were created for each year in the 2021-2030 study period, using the latest Arizona coordinated cases that were developed from Western Electricity Coordinating Council (WECC) approved base cases.

Case Development and Modeling

The study cases for this 2021 ACC Ten-Year Plan were developed from coordination with Arizona utilities (AZCC). Case development descriptions are as follows:

- 2021 – Developed from 2022 AZCC Heavy Summer Case
- 2022 – 2022 AZCC Heavy Summer Case
- 2023 – Developed from 2025 AZCC Heavy Summer Case
- 2024 – Developed from 2025 AZCC Heavy Summer Case
- 2025 – 2025 AZCC Heavy Summer Case
- 2026 – Developed from 2025 AZCC Heavy Summer Case
- 2027 – Developed from 2025 AZCC Heavy Summer Case
- 2028 – Developed from 2030 AZCC Heavy Summer Case
- 2039 – Developed from 2030 AZCC Heavy Summer Case
- 2030 – 2030 AZCC Heavy Summer Case

These base cases include AEPCO loading levels based on the 2019 AEPCO load forecast, consistent with this year's Annual Transmission Planning Assessment analysis. Each of the individual study cases were assembled to match the forecasted peak loads corresponding to each case year. Generation dispatch levels are placed at a medium level, around 300 Megawatts (MW) with area transfers to compensate for the remaining demand.

It should be noted that the Anza Electric Cooperative, Inc. (Anza) load is not located in the southeastern Arizona area and is represented as a transfer with Western Area Lower Colorado (WALC) – Area 19.

The cases prepared for these studies include a conservative power factor for AEPCO's Distribution Cooperative Member systems of approximately 0.98 per unit.

Included Projects

Specific study scenarios were conducted with the addition of the planned projects as described in the Ten-Year Plan in order to meet the AEPCO system reliability criteria. The same or similar projects were included in the latest AEPCO 2021-2024 Construction Work Plan (CWP), and have a high likelihood of being advanced for approval and construction in a subsequent CWP. The inclusion of the modeled planned projects are as follows:

Project	Year									
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Fort. Huachuca Project	-	-	X	X	X	X	X	X	X	X
Schieffelin Project	-	-	X	X	X	X	X	X	X	X
Thornydale - Adonis - Saguaro Interconnection	-	-	X	X	X	X	X	X	X	X
Thornydale - Rattlesnake Interconnection	-	-	-	X	X	X	X	X	X	X
Marana Substation Rebuild	-	-	-	X	X	X	X	X	X	X

Project Descriptions:

- **Fort Huachuca Project:** 69 kV interconnection between AEPCO's Kartchner Substation and Tucson Electric Power's (TEP) Fort Huachuca Substation. **(2022)***
- **Schieffelin Project:** Schieffelin Substation with a 230/69 kV transformation to the Sulphur Springs Valley Electric Cooperative, Inc.'s (SSVEC) distribution system, along with an interconnection to Arizona Public Service's (APS) Boothill Substation. **(2022)***
- **Thornydale - Adonis - Saguaro Interconnection:** 115 kV line between AEPCO's Thornydale Substation and to APS' Saguaro Substation **(2022).** Followed by the construction of AEPCO's Adonis Substation, with loop-in from the Thornydale – Saguaro 115 kV line. **(2023)**
- **Thornydale - Rattlesnake Interconnection:** 115 kV line between AEPCO's Thornydale Substation and Western Area Power Administration's (WAPA) Rattlesnake Substation. **(2024)**
- **Marana Substation Rebuild:** Rebuild of AEPCO's Marana Substation to ring bus configuration with looped-in connection from WAPA's Electrical District 5 (ED5) – Rattlesnake 115 kV line. **(2024)**

*Note: Although the projected in service date is 2022, these projects have a high probability of being completed after the summer, therefore they are not modeled in the 2022 Heavy Summer Case and are included in the following year.

Study Results

The results of this analysis are presented in the form of system plots and advanced result tables. This is due to an extremely large number of scenarios in consideration.

This analysis did not find any criteria violations, or scenarios in which voltage collapse or cascading would occur. The addition of planned projects are found to satisfy the study criteria in question. In some instances, additional operating procedures (i.e. curtailment of load) is required to satisfy stable conditions.

Appendix A contains simple one-line diagrams of AEPCO's transmission system.

The rationale behind the contingencies studied in the steady state analysis are included in **Appendix B**. As part of AEPCO's TPL Assessment, all P1, P2, and P6 outages of the AEPCO's High Voltage (HV) and Extra-High Voltage (EHV) outages were included in the contingency list. Contingency simulations for radial transmission lines have been excluded from this listing.

A steady state analysis was evaluated with the use of the GE PSLF program. The results of this analysis can be found in **Appendix C** of this report. These results include solution convergence reports, system voltage violation reports, and thermal loading violation reports.

A short circuit analysis was performed using ASPEN's One Liner model of the regional electric system, found in **Appendix D**. A short circuit current was calculated for each bus in AEPCO's system. When the modeled fault current is compared with the breakers manufacturer's specifications for interrupting capacity, it can be shown that the breakers in AEPCO's system are fully capable of interrupting the expected fault current likely to occur. This short circuit analysis was performed for the year 2021.

A transient stability analysis was performed with the use of the GE PSLF Stability program. The transient stability analysis is described in **Appendix E** and full plot results are available upon request.

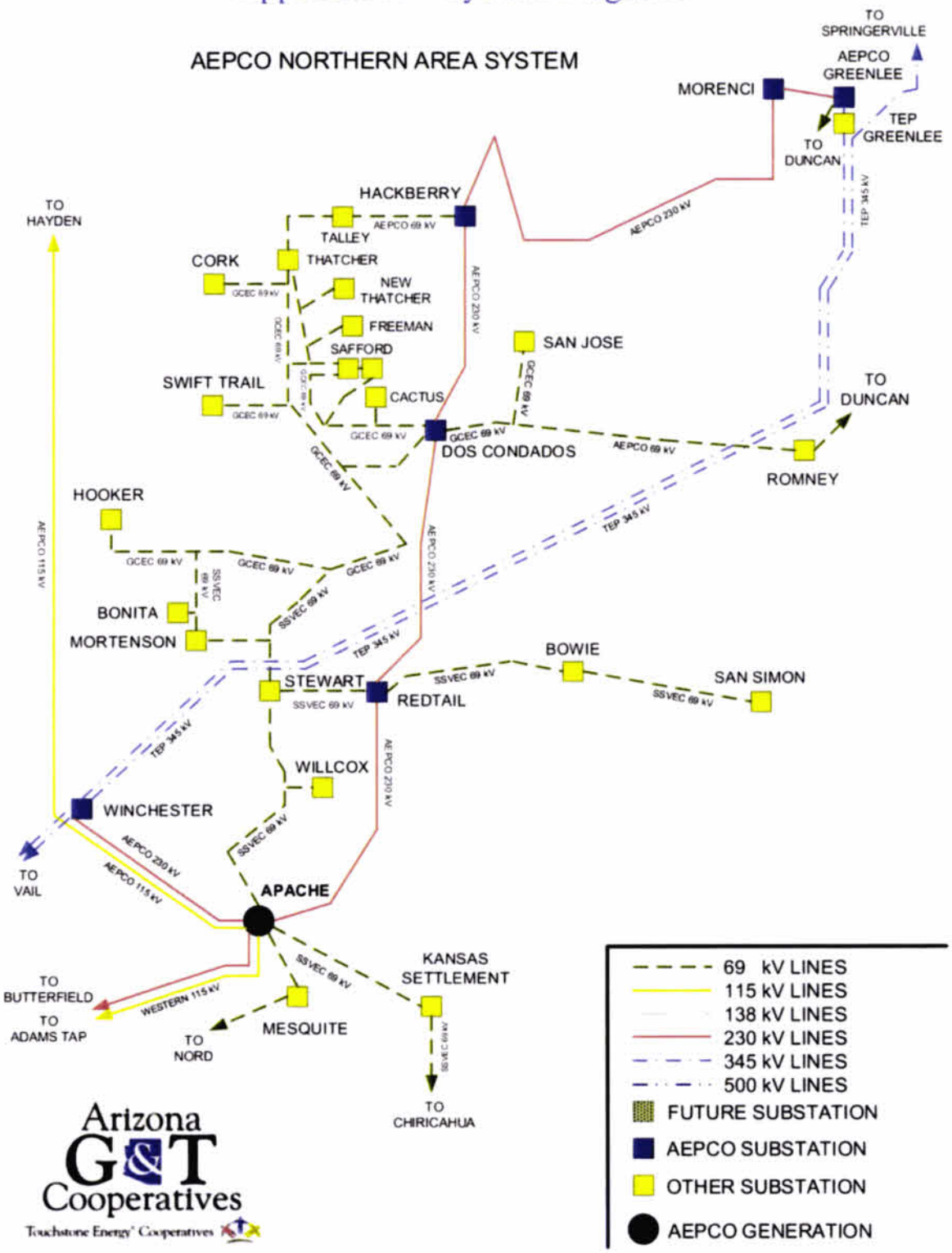
ARIZONA ELECTRIC POWER COOPERATIVE, INC.

TEN-YEAR PLAN

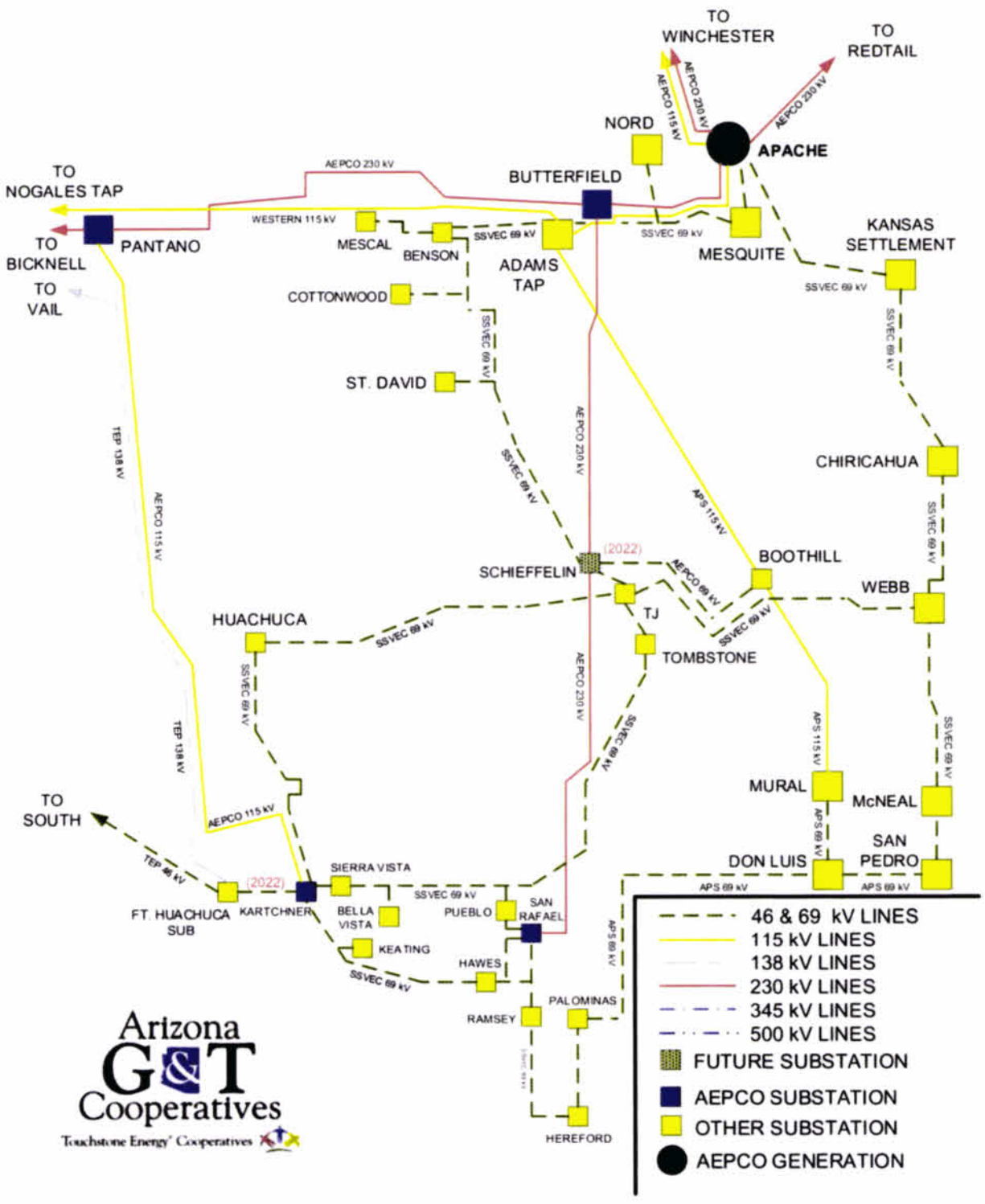
2021 – 2030

Technical Study Report Appendices

Appendix A – System Diagrams



AEPCO SOUTHERN AREA SYSTEM



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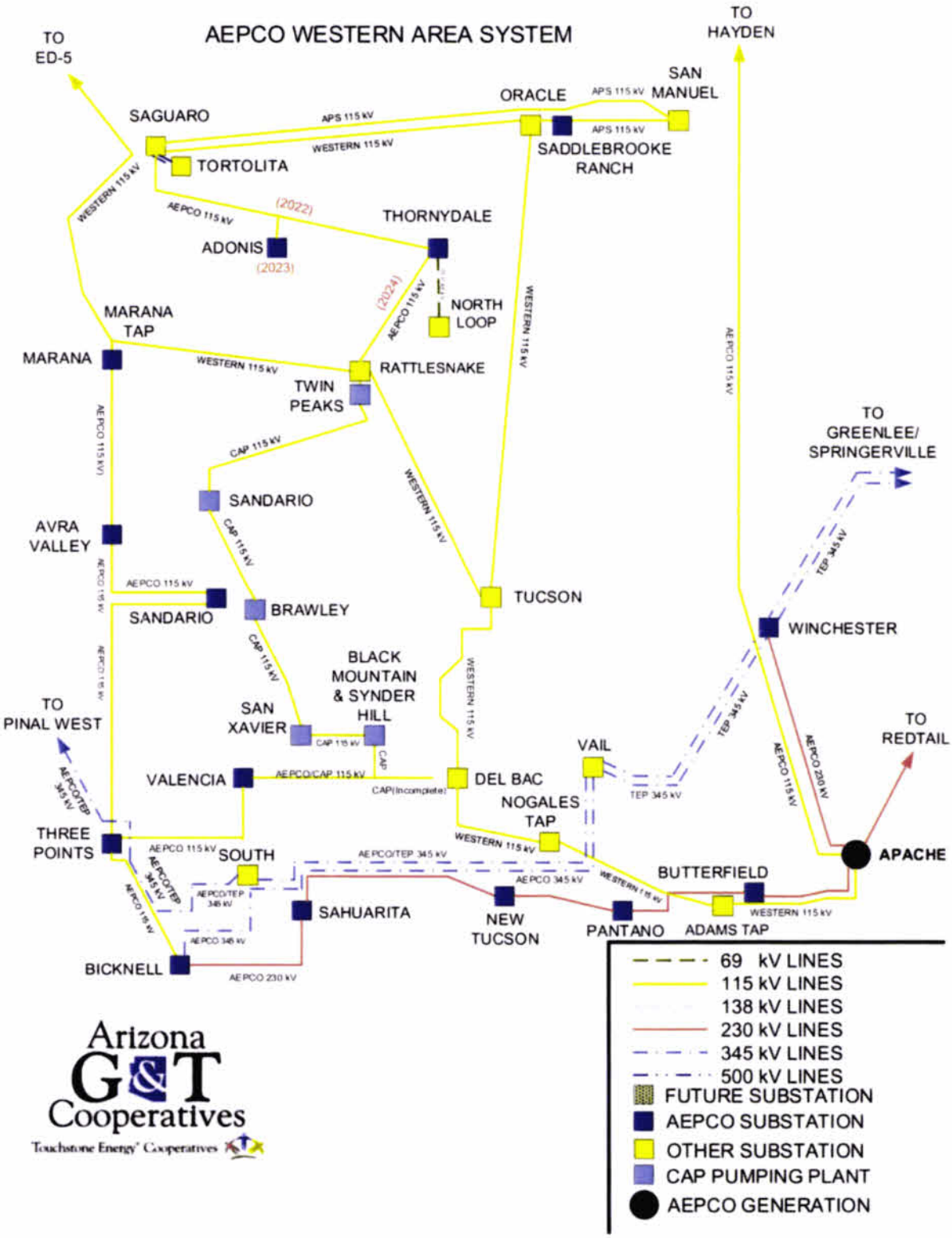

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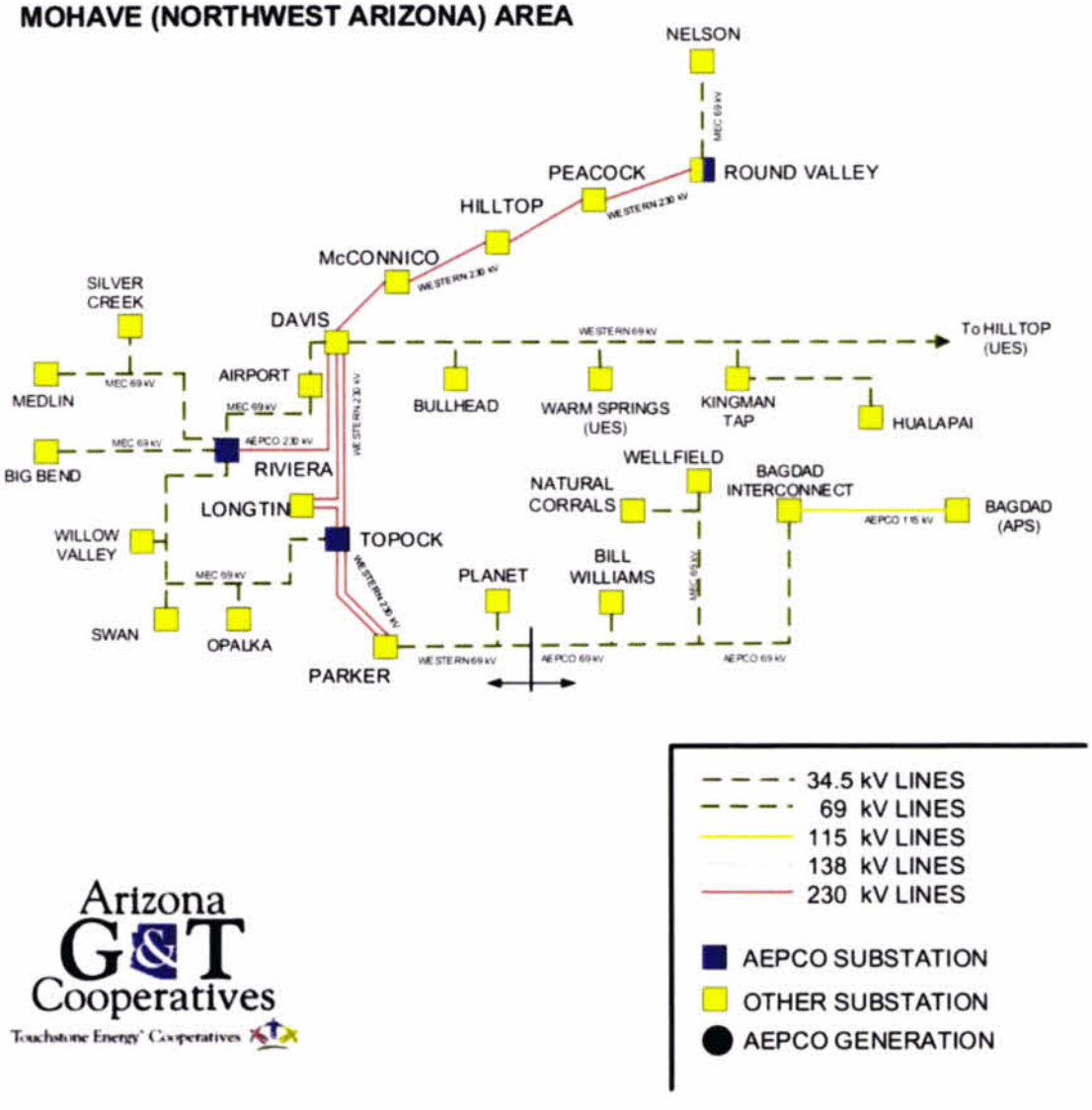
AEPCO CALIFORNIA & NORTHWEST ARIZONA AREA SYSTEMS

ANZA (CALIFORNIA) AREA

MOHAVE (NORTHWEST ARIZONA) AREA



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Appendix B – Steady State Contingency Events and Rationale

The contingency events simulated for each study year for the steady state analysis contains EHV (EHV – greater than 300 kV) Facilities and HV (300 kV and lower voltage systems) Facilities, in accordance with the NERC Bulk Electric System (BES) definition. The classification of system contingencies were performed according to the NERC TPL-001-4 Table 1 – *Steady State and Stability Performance Planning Events*.

Additionally, AEPCO coordinated with adjacent Transmission Planners to ensure that contingencies on adjacent systems which may impact AEPCO are included on the contingency list. Simulation events that belong to the adjacent systems, pertain only to the interconnected system in southeast Arizona and do not include remote systems or buses of the neighboring entities that have no connection to AEPCO and the surrounding interconnected transmission system.

It should be noted that AEPCO does not simulate the removal of additional elements as the result of protection systems and other automatic controls following a contingency. This omission is made because the events to which automatic transmission element tripping occurs is only with elements that feed load areas, thus cascading would not occur.

P0 – No Contingency (Steady State, All Lines In Service [ALIS] Scenario):

AEPCO studies its system with ALIS as its base case scenario.

P1 – Single Contingency (Loss of one of the following – Generator, Transmission Circuit, or Transformer):

As a matter of course, AEPCO considers all Category P1 contingencies on its transmission system, with the exception of radial transmission lines serving a single substation or load. This has been done to determine if the forecasted demands will impact any element on the AEPCO transmission system in the future.

Additionally, AEPCO considers certain Category P1 contingencies events of its interconnected neighboring utilities.

P2 – Single Contingency (Opening of a line section without a Fault, Bus Section Fault, or Internal Breaker Fault):

For Category P2 outages, AEPCO looks at its most critical internal breaker faults and bus section faults, which could result in the loss of critical transmission paths on AEPCO's transmission system.

P3 – Multiple Contingency (Loss of a Generator followed by another system element):

Due to the analysis of sensitivity scenarios in the TPL analysis, no Category P3 contingencies were evaluated. This decision was made as to avoid redundancy in the results. The sensitivity studies simulate outages in conjunction with adjustments to AEPCO's generation, placing generation output at both minimum and maximum levels. Thus, the loss of a generating unit followed by a system element was simulated within the scenarios where generation output was dispatched at minimum levels.

P4 – Multiple Contingency (Loss of multiple elements caused by a stuck breaker):

AEPCO simulated stuck breaker events using the same contingency list as used to simulate bus section faults and internal breaker failures (Category P2 contingencies). AEPCO determined that the loss of multiple elements due to a stuck breaker would be substantially identical to the contingency events studied for P2 events.

P5 – Multiple Contingency (Delayed Fault Clearing due to the failure of non-redundant relay):

AEPCO has endeavored to create a robust and stable system, as a result, all non-radial lines are covered by redundant relays, and thus no Category P5 outages are studied in AEPCO's analysis.

P6 – Multiple Contingency (Two overlapping singles):

AEPCO simulated double contingency outages on its system, taking into account all possible transmission line and transformer outage combinations (with the exception of radial transmission lines and transformers). Additionally, AEPCO has considered all impactful double contingency outages of its interconnected neighboring utilities.

P7 – Multiple Contingency (Common Structure):

AEPCO has only one P7 contingency in consideration (Loss of APACHE-WINCHESTER [230] | APACHE-HAYDENAZ [115] which is included in the P6 contingency list), thus simulating the only instance where the loss of two adjacent circuits on a common structure could occur within AEPCO's system.

Appendix C – Steady State Results

Solution Convergence Reports

Years 1 – 5 (2021-2025):

Contingency Description	2021HS	2022HS	2023HS	2024HS	2025HS
Base Case	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SAN_RAF[230], P1_2	SOLVED	SOLVED	N/A	N/A	N/A
BUTERFLD-SCHIEFFELIN[230], P1_2	N/A	N/A	SOLVED	SOLVED	SOLVED
SAN_RAF-SCHIEFFELIN[230], P1_2	N/A	N/A	SOLVED	SOLVED	SOLVED
PANTANO-NEWTUCSN[230], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
REDTAIL-DOSCONDO[230], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
DOSCONDO-HACKBERY[230], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
HACKBERY-MORENCI[230], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MORENCI-GREEN-AE[230], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] (AEPCO-SRP), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
VALEN-AE-BLACKMTN[115] (AEPCO-CAP), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
RATTLSNK-TWINPEAK[115] (WALC-CAP), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANATAP-MARANA[115] (AEPCO-WALC), P1_2	SOLVED	SOLVED	SOLVED	N/A	N/A
MARANATAP-RATTLSNK[115] (WALC), P1_2	SOLVED	SOLVED	SOLVED	N/A	N/A
MARANATAP-ED-5[115] (WALC), P1_2	SOLVED	SOLVED	SOLVED	N/A	N/A
MARANA-ED-5[115] (AEPCO-WALC), P1_2	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-RATTLSNK[115] (AEPCO-WALC), P1_2	N/A	N/A	N/A	SOLVED	SOLVED
SAG.WEST-ED-5[115] (WALC-APS), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

SAG.EAST-SAG.WEST[115] (APS), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAG.EAST-ORACLE[115] (WALC-APS), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAG.EAST-ADONIS[115] (AEPCO-APS), P1_2	N/A	N/A	SOLVED	SOLVED	SOLVED
THRNYDLE-ADONIS[115], P1_2	N/A	N/A	SOLVED	SOLVED	SOLVED
THRNYDLE-RATTLSNK[115] (AEPCO-WALC), P1_2	N/A	N/A	N/A	SOLVED	SOLVED
VALLEYFARMS-ORACLE[115] (WALC), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
TUCSON-ORACLE[115] (WALC), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ORACLE-S.BRKRCH[115] (AEPCO-WALC), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
S.BRKRCH-SNMANUEL[115] (AEPCO-APS), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREEN-AE-GREENLEE[345] (AEPCO-TEP), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
HIDALGO-GREENLEE[345] (TEP), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREENLEE-COPPER_VERDE[345] (TEP), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SPRINGRVILLE-VAIL[345] (TEP), P1_2	SOLVED	SOLVED	N/A	N/A	N/A
VAIL-SOUTH[345] (TEP), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREENLEE-VAIL[345] (TEP), P1_2	N/A	N/A	SOLVED	SOLVED	SOLVED
GREENLEE-WINCHESTER[345] (TEP), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CW_POI#1-GREENLEE[345] (TEP), P1_2	SOLVED	SOLVED	N/A	N/A	N/A
CW_POI#1A-GREENLEE[345] (TEP), P1_2	N/A	N/A	SOLVED	SOLVED	SOLVED
SPRINGRVILLE-CW_POI[345] (TEP), P1_2	SOLVED	SOLVED	N/A	N/A	N/A
BICKNELL-VAIL[345] (AEPCO-TEP), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA_Group [115] (AEPCO-WALC), P1_2	SOLVED	SOLVED	SOLVED	N/A	N/A
CAP_Group [115] (AEPCO-CAP-WALC)), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] (AEPCO-WALC-APS), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-AE-APACHE[69/115], P1_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115], P1_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115], P1_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230], P1_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREEN-AE-GREEN-AE[345/230], P1_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] (AEPCO-TEP), P1_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
VAIL-VAIL3WP[345/138] (TEP), P1_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
VAIL-VAIL[345/138] (TEP), P1_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
VAIL-VAIL2[345/138] (TEP), P1_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
Breaker_Fault-APACHE(201) [230], P2_3	DIV	DIV	SOLVED	SOLVED	SOLVED
Breaker_Fault-APACHE(202) [230], P2_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
Breaker_Fault-APACHE(204) [230], P2_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

Breaker_Fault-APACHE(205) [230], P2_3	SOLVED	DIV	SOLVED	SOLVED	SOLVED
Breaker_Fault-APACHE(207) [230], P2_3	DIV	DIV	SOLVED	SOLVED	SOLVED
Breaker_Fault-APACHE(210) [230], P2_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
Breaker_Fault-APACHE(211) [230], P2_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
Breaker_Fault-BICKNELL(202) [230], P2_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
Breaker_Fault-BICKNELL(204) [230], P2_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
Breaker_Fault-BICKNELL(205) [230], P2_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MainBusFault-APACHE [115], P2_4	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MainBusFault-BICKNELL [115], P2_4	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | APACHE-APACHE[230/115], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | APACHE-BUTERFLD[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | APACHE-REDTAIL[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | APACHE-WINCHESTER[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | BUTERFLD-PANTANO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | BUTERFLD-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | WINCHESTER-WINCHESTER[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | AVRA-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | MARANA-AVRA[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | SAHUARIT-BICKNELL[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | BICKNELL-BICKNELL[230/115], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | BICKNELL-BICKNELL[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | BICKNELL-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | BICKNELL-THREEPNT[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | MARANA-ED-5[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | MARANA-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | THRNYDLE-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED

APACHE-HAYDENAZ[115] | THRNYDLE-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | SAG.EAST-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | GREENLEE-VAIL[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | BUTERFLD-SAN_RAF[230], P6_1_1	SOLVED	SOLVED	N/A	N/A	N/A
APACHE-APACHE[230/115] | APACHE-BUTERFLD[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | APACHE-REDTAIL[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | APACHE-WINCHESTER[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | BUTERFLD-PANTANO[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | BUTERFLD-SCHIEFFELIN[230], P6_2_1	N/A	N/A	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | WINCHESTER-WINCHESTER[345/230], P6_2_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | AVRA-SNDARIO[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | MARANA-AVRA[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | SAHUARIT-BICKNELL[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | BICKNELL-BICKNELL[230/115], P6_2_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | BICKNELL-BICKNELL[345/230], P6_2_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | BICKNELL-VAIL[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | BICKNELL-THREEPNT[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | MARANA-ED-5[115], P6_2_1	N/A	N/A	N/A	SOLVED	SOLVED
APACHE-APACHE[230/115] | MARANA-RATTLSNK[115], P6_2_1	N/A	N/A	N/A	SOLVED	SOLVED
APACHE-APACHE[230/115] | THREEPNT-VALEN-AE[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

APACHE-APACHE[230/115]	THREEPNT-SNDARIO[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115]	NEWTUCSN-SAHUARIT[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115]	PANTANO-NEWTUCSN[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115]	THRNYDLE-ADONIS[115], P6_2_1	N/A	N/A	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115]	THRNYDLE-RATTLSNK[115], P6_2_1	N/A	N/A	N/A	SOLVED	SOLVED
APACHE-APACHE[230/115]	SAG.EAST-ADONIS[115], P6_2_1	N/A	N/A	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115]	REDTAIL-DOSCONDO[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115]	SAN_RAF-SCHIEFFELIN[230], P6_2_1	N/A	N/A	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115]	GREENLEE-WINCHESTER[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115]	GREEN-AE-GREENLEE[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115]	GREENLEE-VAIL[345], P6_2_1	N/A	N/A	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115]	GREEN-AE-GREEN-AE[345/230], P6_2_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115]	MORENCI-GREEN-AE[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115]	HACKBERY-MORENCI[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115]	DOSCONDO-HACKBERY[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115]	BUTERFLD-SAN_RAF[230], P6_2_1	SOLVED	SOLVED	N/A	N/A	N/A
APACHE-APACHE[230/115]	APACHE-APACHE[230/115], P6_2_2	DIV	DIV	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	APACHE-REDTAIL[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	APACHE-WINCHESTER[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	BUTERFLD-PANTANO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	BUTERFLD-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	WINCHESTER-WINCHESTER[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	AVRA-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	MARANA-AVRA[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	SAHUARIT-BICKNELL[230], P6_1_1	SOLVED	SOLVED	DIV	DIV	DIV
APACHE-BUTERFLD[230]	BICKNELL-BICKNELL[230/115], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	BICKNELL-BICKNELL[345/230], P6_1_2	DIV	DIV	DIV	DIV	DIV
APACHE-BUTERFLD[230]	BICKNELL-VAIL[345], P6_1_1	DIV	DIV	DIV	DIV	DIV

APACHE-BUTERFLD[230] | BICKNELL-THREEPNT[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230] | MARANA-ED-5[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
APACHE-BUTERFLD[230] | MARANA-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
APACHE-BUTERFLD[230] | THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230] | THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230] | THRNYDLE-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230] | THRNYDLE-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
APACHE-BUTERFLD[230] | SAG.EAST-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230] | GREENLEE-VAIL[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230] | BUTERFLD-SAN_RAF[230], P6_1_1	SOLVED	SOLVED	N/A	N/A	N/A
APACHE-REDTAIL[230] | APACHE-WINCHESTER[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | BUTERFLD-PANTANO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | BUTERFLD-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | WINCHESTER-WINCHESTER[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | AVRA-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | MARANA-AVRA[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | SAHUARIT-BICKNELL[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | BICKNELL-BICKNELL[230/115], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

APACHE-REDTAIL[230] | BICKNELL-BICKNELL[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | BICKNELL-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | BICKNELL-THREEPNT[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | MARANA-ED-5[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
APACHE-REDTAIL[230] | MARANA-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
APACHE-REDTAIL[230] | THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | THRNYDLE-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | THRNYDLE-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
APACHE-REDTAIL[230] | SAG.EAST-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | GREENLEE-VAIL[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | BUTERFLD-SAN_RAF[230], P6_1_1	SOLVED	SOLVED	N/A	N/A	N/A
APACHE-WINCHESTER[230] | BUTERFLD-PANTANO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | BUTERFLD-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | WINCHESTER-WINCHESTER[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | AVRA-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | MARANA-AVRA[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | SAHUARIT-BICKNELL[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

APACHE-WINCHESTER[230] | BICKNELL-BICKNELL[230/115], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | BICKNELL-BICKNELL[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | BICKNELL-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | BICKNELL-THREEPNT[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | MARANA-ED-5[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
APACHE-WINCHESTER[230] | MARANA-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
APACHE-WINCHESTER[230] | THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | THRNYDLE-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | THRNYDLE-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
APACHE-WINCHESTER[230] | SAG.EAST-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | GREENLEE-VAIL[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | BUTERFLD-SAN_RAF[230], P6_1_1	SOLVED	SOLVED	N/A	N/A	N/A
BUTERFLD-PANTANO[230] | BUTERFLD-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | WINCHESTER-WINCHESTER[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | AVRA-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | MARANA-AVRA[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | SAHUARIT-BICKNELL[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

BUTERFLD-PANTANO[230] | BICKNELL-BICKNELL[230/115], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | BICKNELL-BICKNELL[345/230], P6_1_2	DIV	DIV	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | BICKNELL-VAIL[345], P6_1_1	DIV	DIV	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | BICKNELL-THREEPNT[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | MARANA-ED-5[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | MARANA-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | THRNYDLE-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | THRNYDLE-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | SAG.EAST-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | GREENLEE-VAIL[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | BUTERFLD-SAN_RAF[230], P6_1_1	SOLVED	SOLVED	N/A	N/A	N/A
BUTERFLD-SCHIEFFELIN[230] | WINCHESTER-WINCHESTER[345/230], P6_1_2	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | AVRA-SNDARIO[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | MARANA-AVRA[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | SAHUARIT-BICKNELL[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | BICKNELL-BICKNELL[230/115], P6_1_2	N/A	N/A	SOLVED	SOLVED	SOLVED

BUTERFLD-SCHIEFFELIN[230] | BICKNELL-BICKNELL[345/230], P6_1_2	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | BICKNELL-VAIL[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | BICKNELL-THREEPNT[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | MARANA-ED-5[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | MARANA-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | THREEPNT-VALEN-AE[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | THREEPNT-SNDARIO[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | NEWTUCSN-SAHUARIT[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | PANTANO-NEWTUCSN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | THRNYDLE-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | THRNYDLE-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | SAG.EAST-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | REDTAIL-DOSCONDO[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | GREENLEE-WINCHESTER[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | GREEN-AE-GREENLEE[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | GREENLEE-VAIL[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | GREEN-AE-GREEN-AE[345/230], P6_1_2	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | MORENCI-GREEN-AE[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | HACKBERY-MORENCI[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | DOSCONDO-HACKBERY[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | AVRA-SNDARIO[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | MARANA-AVRA[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | SAHUARIT-BICKNELL[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | BICKNELL-BICKNELL[230/115], P6_2_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | BICKNELL-BICKNELL[345/230], P6_2_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | BICKNELL-VAIL[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | BICKNELL-THREEPNT[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

WINCHESTER-WINCHESTER[345/230] | MARANA-ED-5[115], P6_2_1	N/A	N/A	N/A	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | MARANA-RATTLSNK[115], P6_2_1	N/A	N/A	N/A	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | THREEPNT-VALEN-AE[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | THREEPNT-SNDARIO[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | NEWTUCSN-SAHUARIT[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | PANTANO-NEWTUCSN[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | THRNYDLE-ADONIS[115], P6_2_1	N/A	N/A	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | THRNYDLE-RATTLSNK[115], P6_2_1	N/A	N/A	N/A	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | SAG.EAST-ADONIS[115], P6_2_1	N/A	N/A	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | REDTAIL-DOSCONDO[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | SAN_RAF-SCHIEFFELIN[230], P6_2_1	N/A	N/A	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | GREENLEE-WINCHESTER[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | GREEN-AE-GREENLEE[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | GREENLEE-VAIL[345], P6_2_1	N/A	N/A	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | GREEN-AE-GREEN-AE[345/230], P6_2_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | MORENCI-GREEN-AE[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | HACKBERY-MORENCI[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | DOSCONDO-HACKBERY[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | BUTERFLD-SAN_RAF[230], P6_2_1	SOLVED	SOLVED	N/A	N/A	N/A
AVRA-SNDARIO[115] | MARANA-AVRA[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | SAHUARIT-BICKNELL[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | BICKNELL-BICKNELL[230/115], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | BICKNELL-BICKNELL[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | BICKNELL-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | BICKNELL-THREEPNT[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | MARANA-ED-5[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
AVRA-SNDARIO[115] | MARANA-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
AVRA-SNDARIO[115] | THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

AVRA-SNDARIO[115] | THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | THRNYDLE-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | THRNYDLE-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
AVRA-SNDARIO[115] | SAG.EAST-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | GREENLEE-VAIL[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | BUTERFLD-SAN_RAF[230], P6_1_1	SOLVED	SOLVED	N/A	N/A	N/A
MARANA-AVRA[115] | SAHUARIT-BICKNELL[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | BICKNELL-BICKNELL[230/115], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | BICKNELL-BICKNELL[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | BICKNELL-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | BICKNELL-THREEPNT[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | MARANA-ED-5[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-AVRA[115] | MARANA-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-AVRA[115] | THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | THRNYDLE-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED

MARANA-AVRA[115] | THRNYDLE-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-AVRA[115] | SAG.EAST-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | GREENLEE-VAIL[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | BUTERFLD-SAN_RAF[230], P6_1_1	SOLVED	SOLVED	N/A	N/A	N/A
SAHUARIT-BICKNELL[230] | BICKNELL-BICKNELL[230/115], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | BICKNELL-BICKNELL[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | BICKNELL-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | BICKNELL-THREEPNT[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | MARANA-ED-5[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | MARANA-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | THRNYDLE-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | THRNYDLE-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | SAG.EAST-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

SAHUARIT-BICKNELL[230] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | GREENLEE-VAIL[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | BUTERFLD-SAN_RAF[230], P6_1_1	SOLVED	SOLVED	N/A	N/A	N/A
BICKNELL-BICKNELL[230/115] | BICKNELL-BICKNELL[345/230], P6_2_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | BICKNELL-VAIL[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | BICKNELL-THREEPNT[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | MARANA-ED-5[115], P6_2_1	N/A	N/A	N/A	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | MARANA-RATTLSNK[115], P6_2_1	N/A	N/A	N/A	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | THREEPNT-VALEN-AE[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | THREEPNT-SNDARIO[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | NEWTUCSN-SAHUARIT[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | PANTANO-NEWTUCSN[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | THRNYDLE-ADONIS[115], P6_2_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | THRNYDLE-RATTLSNK[115], P6_2_1	N/A	N/A	N/A	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | SAG.EAST-ADONIS[115], P6_2_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | REDTAIL-DOSCONDO[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | SAN_RAF-SCHIEFFELIN[230], P6_2_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | GREENLEE-WINCHESTER[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | GREEN-AE-GREENLEE[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | GREENLEE-VAIL[345], P6_2_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | GREEN-AE-GREEN-AE[345/230], P6_2_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | MORENCI-GREEN-AE[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | HACKBERY-MORENCI[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | DOSCONDO-HACKBERY[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

BICKNELL-BICKNELL[230/115] | BUTERFLD-SAN_RAF[230], P6_2_1	SOLVED	SOLVED	N/A	N/A	N/A
BICKNELL-BICKNELL[230/115] | BICKNELL-BICKNELL[230/115], P6_2_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230] | BICKNELL-VAIL[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230] | BICKNELL-THREEPNT[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230] | MARANA-ED-5[115], P6_2_1	N/A	N/A	N/A	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230] | MARANA-RATTLSNK[115], P6_2_1	N/A	N/A	N/A	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230] | THREEPNT-VALEN-AE[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230] | THREEPNT-SNDARIO[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230] | NEWTUCSN-SAHUARIT[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230] | PANTANO-NEWTUCSN[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230] | THRNYDLE-ADONIS[115], P6_2_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230] | THRNYDLE-RATTLSNK[115], P6_2_1	N/A	N/A	N/A	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230] | SAG.EAST-ADONIS[115], P6_2_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230] | REDTAIL-DOSCONDO[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230] | SAN_RAF-SCHIEFFELIN[230], P6_2_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230] | GREENLEE-WINCHESTER[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230] | GREEN-AE-GREENLEE[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230] | GREENLEE-VAIL[345], P6_2_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230] | GREEN-AE-GREEN-AE[345/230], P6_2_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230] | MORENCI-GREEN-AE[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230] | HACKBERY-MORENCI[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230] | DOSCONDO-HACKBERY[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230] | BUTERFLD-SAN_RAF[230], P6_2_1	SOLVED	SOLVED	N/A	N/A	N/A
BICKNELL-VAIL[345] | BICKNELL-THREEPNT[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345] | MARANA-ED-5[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
BICKNELL-VAIL[345] | MARANA-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
BICKNELL-VAIL[345] | THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345] | THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

BICKNELL-VAIL[345] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345] | THRNYDLE-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345] | THRNYDLE-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
BICKNELL-VAIL[345] | SAG.EAST-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345] | GREENLEE-VAIL[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345] | BUTERFLD-SAN_RAF[230], P6_1_1	SOLVED	SOLVED	N/A	N/A	N/A
BICKNELL-THREEPNT[115] | MARANA-ED-5[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | MARANA-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | THRNYDLE-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | THRNYDLE-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | SAG.EAST-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

BICKNELL-THREEPNT[115] | GREENLEE-VAIL[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | BUTERFLD-SAN_RAF[230], P6_1_1	SOLVED	SOLVED	N/A	N/A	N/A
MARANA-ED-5[115] | MARANA-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-ED-5[115] | THREEPNT-VALEN-AE[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-ED-5[115] | THREEPNT-SNDARIO[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-ED-5[115] | NEWTUCSN-SAHUARIT[230], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-ED-5[115] | PANTANO-NEWTUCSN[230], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-ED-5[115] | THRNYDLE-ADONIS[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-ED-5[115] | THRNYDLE-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-ED-5[115] | SAG.EAST-ADONIS[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-ED-5[115] | REDTAIL-DOSCONDO[230], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-ED-5[115] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-ED-5[115] | GREENLEE-WINCHESTER[345], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-ED-5[115] | GREEN-AE-GREENLEE[345], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-ED-5[115] | GREENLEE-VAIL[345], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-ED-5[115] | GREEN-AE-GREEN-AE[345/230], P6_1_2	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-ED-5[115] | MORENCI-GREEN-AE[230], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-ED-5[115] | HACKBERY-MORENCI[230], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-ED-5[115] | DOSCONDO-HACKBERY[230], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-RATTLSNK[115] | THREEPNT-VALEN-AE[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-RATTLSNK[115] | THREEPNT-SNDARIO[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-RATTLSNK[115] | NEWTUCSN-SAHUARIT[230], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-RATTLSNK[115] | PANTANO-NEWTUCSN[230], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-RATTLSNK[115] | THRNYDLE-ADONIS[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED

MARANA-RATTLSNK[115] | THRNYDLE-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-RATTLSNK[115] | SAG.EAST-ADONIS[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-RATTLSNK[115] | REDTAIL-DOSCONDO[230], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-RATTLSNK[115] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-RATTLSNK[115] | GREENLEE-WINCHESTER[345], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-RATTLSNK[115] | GREEN-AE-GREENLEE[345], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-RATTLSNK[115] | GREENLEE-VAIL[345], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-RATTLSNK[115] | GREEN-AE-GREEN-AE[345/230], P6_1_2	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-RATTLSNK[115] | MORENCI-GREEN-AE[230], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-RATTLSNK[115] | HACKBERY-MORENCI[230], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-RATTLSNK[115] | DOSCONDO-HACKBERY[230], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
MARANA-RATTLSNK[115] | BUTERFLD-SAN_RAF[230], P6_1_1	N/A	N/A	N/A	N/A	N/A
THREEPNT-VALEN-AE[115] | THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115] | THRNYDLE-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115] | THRNYDLE-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
THREEPNT-VALEN-AE[115] | SAG.EAST-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115] | GREENLEE-VAIL[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115] | BUTERFLD-SAN_RAF[230], P6_1_1	SOLVED	SOLVED	N/A	N/A	N/A

THREEPNT-SNDARIO[115] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | THRNYDLE-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | THRNYDLE-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | SAG.EAST-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | GREENLEE-VAIL[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | BUTERFLD-SAN_RAF[230], P6_1_1	SOLVED	SOLVED	N/A	N/A	N/A
NEWTUCSN-SAHUARIT[230] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230] | THRNYDLE-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230] | THRNYDLE-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230] | SAG.EAST-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230] | GREENLEE-VAIL[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

NEWTUCSN-SAHUARIT[230] | BUTERFLD-SAN_RAF[230], P6_1_1	SOLVED	SOLVED	N/A	N/A	N/A
PANTANO-NEWTUCSN[230] | THRNYDLE-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
PANTANO-NEWTUCSN[230] | THRNYDLE-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
PANTANO-NEWTUCSN[230] | SAG.EAST-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
PANTANO-NEWTUCSN[230] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
PANTANO-NEWTUCSN[230] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
PANTANO-NEWTUCSN[230] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
PANTANO-NEWTUCSN[230] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
PANTANO-NEWTUCSN[230] | GREENLEE-VAIL[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
PANTANO-NEWTUCSN[230] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
PANTANO-NEWTUCSN[230] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
PANTANO-NEWTUCSN[230] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
PANTANO-NEWTUCSN[230] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
PANTANO-NEWTUCSN[230] | BUTERFLD-SAN_RAF[230], P6_1_1	SOLVED	SOLVED	N/A	N/A	N/A
THRNYDLE-ADONIS[115] | THRNYDLE-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
THRNYDLE-ADONIS[115] | SAG.EAST-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
THRNYDLE-ADONIS[115] | REDTAIL-DOSCONDO[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
THRNYDLE-ADONIS[115] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
THRNYDLE-ADONIS[115] | GREENLEE-WINCHESTER[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
THRNYDLE-ADONIS[115] | GREEN-AE-GREENLEE[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
THRNYDLE-ADONIS[115] | GREENLEE-VAIL[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
THRNYDLE-ADONIS[115] | GREEN-AE-GREEN-AE[345/230], P6_1_2	N/A	N/A	SOLVED	SOLVED	SOLVED
THRNYDLE-ADONIS[115] | MORENCI-GREEN-AE[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
THRNYDLE-ADONIS[115] | HACKBERY-MORENCI[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
THRNYDLE-ADONIS[115] | DOSCONDO-HACKBERY[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
THRNYDLE-RATTLSNK[115] | SAG.EAST-ADONIS[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
THRNYDLE-RATTLSNK[115] | REDTAIL-DOSCONDO[230], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
THRNYDLE-RATTLSNK[115] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED

THRNYDLE-RATTLSNK[115]	GREENLEE-WINCHESTER[345], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
THRNYDLE-RATTLSNK[115]	GREEN-AE-GREENLEE[345], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
THRNYDLE-RATTLSNK[115]	GREENLEE-VAIL[345], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
THRNYDLE-RATTLSNK[115]	GREEN-AE-GREEN-AE[345/230], P6_1_2	N/A	N/A	N/A	SOLVED	SOLVED
THRNYDLE-RATTLSNK[115]	MORENCI-GREEN-AE[230], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
THRNYDLE-RATTLSNK[115]	HACKBERY-MORENCI[230], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
THRNYDLE-RATTLSNK[115]	DOSCONDO-HACKBERY[230], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
SAG.EAST-ADONIS[115]	REDTAIL-DOSCONDO[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
SAG.EAST-ADONIS[115]	SAN_RAF-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
SAG.EAST-ADONIS[115]	GREENLEE-WINCHESTER[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
SAG.EAST-ADONIS[115]	GREEN-AE-GREENLEE[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
SAG.EAST-ADONIS[115]	GREENLEE-VAIL[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
SAG.EAST-ADONIS[115]	GREEN-AE-GREEN-AE[345/230], P6_1_2	N/A	N/A	SOLVED	SOLVED	SOLVED
SAG.EAST-ADONIS[115]	MORENCI-GREEN-AE[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
SAG.EAST-ADONIS[115]	HACKBERY-MORENCI[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
SAG.EAST-ADONIS[115]	DOSCONDO-HACKBERY[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
REDTAIL-DOSCONDO[230]	SAN_RAF-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
REDTAIL-DOSCONDO[230]	GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
REDTAIL-DOSCONDO[230]	GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
REDTAIL-DOSCONDO[230]	GREENLEE-VAIL[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
REDTAIL-DOSCONDO[230]	GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
REDTAIL-DOSCONDO[230]	MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
REDTAIL-DOSCONDO[230]	HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
REDTAIL-DOSCONDO[230]	DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
REDTAIL-DOSCONDO[230]	BUTERFLD-SAN_RAF[230], P6_1_1	SOLVED	SOLVED	N/A	N/A	N/A
SAN_RAF-SCHIEFFELIN[230]	GREENLEE-WINCHESTER[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
SAN_RAF-SCHIEFFELIN[230]	GREEN-AE-GREENLEE[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
SAN_RAF-SCHIEFFELIN[230]	GREENLEE-VAIL[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED

SAN_RAF-SCHIEFFELIN[230] | GREEN-AE-GREEN-AE[345/230], P6_1_2	N/A	N/A	SOLVED	SOLVED	SOLVED
SAN_RAF-SCHIEFFELIN[230] | MORENCI-GREEN-AE[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
SAN_RAF-SCHIEFFELIN[230] | HACKBERY-MORENCI[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
SAN_RAF-SCHIEFFELIN[230] | DOSCONDO-HACKBERY[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
GREENLEE-WINCHESTER[345] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREENLEE-WINCHESTER[345] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREENLEE-WINCHESTER[345] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREENLEE-WINCHESTER[345] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREENLEE-WINCHESTER[345] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREENLEE-WINCHESTER[345] | BUTERFLD-SAN_RAF[230], P6_1_1	SOLVED	SOLVED	N/A	N/A	N/A
WINCHESTER-VAIL[345] | BUTERFLD-SAN_RAF[230], P6_1_1	SOLVED	SOLVED	N/A	N/A	N/A
GREEN-AE-GREENLEE[345] | GREENLEE-VAIL[345], P6_1_1	N/A	N/A	DIV	SOLVED	SOLVED
GREEN-AE-GREENLEE[345] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREEN-AE-GREENLEE[345] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREEN-AE-GREENLEE[345] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREEN-AE-GREENLEE[345] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREEN-AE-GREENLEE[345] | BUTERFLD-SAN_RAF[230], P6_1_1	SOLVED	SOLVED	N/A	N/A	N/A
GREENLEE-VAIL[345] | GREEN-AE-GREEN-AE[345/230], P6_1_2	N/A	N/A	DIV	SOLVED	SOLVED
GREENLEE-VAIL[345] | MORENCI-GREEN-AE[230], P6_1_1	N/A	N/A	DIV	SOLVED	SOLVED
GREENLEE-VAIL[345] | HACKBERY-MORENCI[230], P6_1_1	N/A	N/A	DIV	SOLVED	SOLVED
GREENLEE-VAIL[345] | DOSCONDO-HACKBERY[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
GREENLEE-VAIL[345] | BUTERFLD-SAN_RAF[230], P6_1_1	N/A	N/A	N/A	N/A	N/A
GREEN-AE-GREEN-AE[345/230] | MORENCI-GREEN-AE[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREEN-AE-GREEN-AE[345/230] | HACKBERY-MORENCI[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREEN-AE-GREEN-AE[345/230] | DOSCONDO-HACKBERY[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREEN-AE-GREEN-AE[345/230] | BUTERFLD-SAN_RAF[230], P6_2_1	SOLVED	SOLVED	N/A	N/A	N/A
MORENCI-GREEN-AE[230] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MORENCI-GREEN-AE[230] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

MORENCI-GREEN-AE[230] | BUTERFLD-SAN_RAF[230], P6_1_1	SOLVED	SOLVED	N/A	N/A	N/A
HACKBERY-MORENCI[230] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
HACKBERY-MORENCI[230] | BUTERFLD-SAN_RAF[230], P6_1_1	SOLVED	SOLVED	N/A	N/A	N/A
DOSCONDO-HACKBERY[230] | BUTERFLD-SAN_RAF[230], P6_1_1	SOLVED	SOLVED	N/A	N/A	N/A
APACHE-HAYDENAZ[115] | ADAMS_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | APACHE-APACHE[230/115], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | APACHE-BUTERFLD[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | APACHE-REDTAIL[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | APACHE-WINCHESTER[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | BUTERFLD-PANTANO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | BUTERFLD-SCHIEFFELIN[230], P6_1_1	N/A	N/A	DIV	DIV	DIV
ADAMS_Group [115] | WINCHESTER-WINCHESTER[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | AVRA-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | MARANA-AVRA[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | SAHUARIT-BICKNELL[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | BICKNELL-BICKNELL[230/115], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | BICKNELL-BICKNELL[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | BICKNELL-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | BICKNELL-THREEPNT[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | MARANA-ED-5[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
ADAMS_Group [115] | MARANA-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
ADAMS_Group [115] | THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | THRNYDLE-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | THRNYDLE-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
ADAMS_Group [115] | SAG.EAST-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED

ADAMS_Group [115] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | GREENLEE-VAIL[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | BUTERFLD-SAN_RAF[230], P6_1_1	SOLVED	SOLVED	N/A	N/A	N/A
ADAMS_Group [115] | MARANA_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	N/A	N/A
APACHE-APACHE[230/115] | MARANA_Group [115], P6_2_1	SOLVED	SOLVED	SOLVED	N/A	N/A
APACHE-HAYDENAZ[115] | MARANA_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	N/A	N/A
WINCHESTER-WINCHESTER[345/230] | MARANA_Group [115], P6_2_1	SOLVED	SOLVED	SOLVED	N/A	N/A
AVRA-SNDARIO[115] | MARANA_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	N/A	N/A
MARANA-AVRA[115] | MARANA_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	N/A	N/A
SAHUARIT-BICKNELL[230] | MARANA_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	N/A	N/A
BICKNELL-BICKNELL[230/115] | MARANA_Group [115], P6_2_1	SOLVED	SOLVED	SOLVED	N/A	N/A
BICKNELL-BICKNELL[345/230] | MARANA_Group [115], P6_2_1	DIV	DIV	DIV	N/A	N/A
BICKNELL-VAIL[345] | MARANA_Group [115], P6_1_1	DIV	DIV	DIV	N/A	N/A
BICKNELL-THREEPNT[115] | MARANA_Group [115], P6_1_1	DIV	DIV	DIV	N/A	N/A
APACHE-BUTERFLD[230] | MARANA_Group [115], P6_1_1	SOLVED	DIV	SOLVED	N/A	N/A
APACHE-REDTAIL[230] | MARANA_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	N/A	N/A
APACHE-WINCHESTER[230] | MARANA_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	N/A	N/A
BUTERFLD-PANTANO[230] | MARANA_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	N/A	N/A
BUTERFLD-SCHIEFFELIN[230] | MARANA_Group [115], P6_1_1	N/A	N/A	SOLVED	N/A	N/A
MARANA_Group [115] | THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	N/A	N/A
MARANA_Group [115] | THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	N/A	N/A

MARANA_Group [115] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	N/A	N/A
MARANA_Group [115] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	N/A	N/A
MARANA_Group [115] | THRNYDLE-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	N/A	N/A
MARANA_Group [115] | THRNYDLE-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	N/A	N/A
MARANA_Group [115] | SAG.EAST-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	N/A	N/A
MARANA_Group [115] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	N/A	N/A
MARANA_Group [115] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	N/A	N/A
MARANA_Group [115] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	N/A	N/A
MARANA_Group [115] | WINCHESTER-VAIL[345], P6_1_1	SOLVED	SOLVED	DIV	N/A	N/A
MARANA_Group [115] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	N/A	N/A
MARANA_Group [115] | GREENLEE-VAIL[345], P6_1_1	N/A	N/A	DIV	N/A	N/A
MARANA_Group [115] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	N/A	N/A
MARANA_Group [115] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	N/A	N/A
MARANA_Group [115] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	N/A	N/A
MARANA_Group [115] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	N/A	N/A
MARANA_Group [115] | BUTERFLD-SAN_RAF[230], P6_1_1	SOLVED	SOLVED	N/A	N/A	N/A
ADAMS_Group [115] | CAP_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA_Group [115] | CAP_Group [115], P6_1_1	DIV	DIV	DIV	N/A	N/A
APACHE-APACHE[230/115] | CAP_Group [115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | CAP_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | CAP_Group [115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | CAP_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | CAP_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | CAP_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | CAP_Group [115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230] | CAP_Group [115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345] | CAP_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | CAP_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230] | CAP_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

APACHE-REDTAIL[230] | CAP_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | CAP_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | CAP_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | CAP_Group [115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
CAP_Group [115] | THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | THRNYDLE-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
CAP_Group [115] | THRNYDLE-RATTLSNK[115], P6_1_1	N/A	N/A	N/A	SOLVED	SOLVED
CAP_Group [115] | SAG.EAST-ADONIS[115], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
CAP_Group [115] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
CAP_Group [115] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | GREENLEE-VAIL[345], P6_1_1	N/A	N/A	SOLVED	SOLVED	SOLVED
CAP_Group [115] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | BUTERFLD-SAN_RAF[230], P6_1_1	SOLVED	SOLVED	N/A	N/A	N/A

Years 6 – 10 (2026-2030):

Contingency Description	2026HS	2027HS	2028HS	2029HS	2030HS
Base Case	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAN_RAF-SCHIEFFELIN[230], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
PANTANO-NEWTUCSN[230], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
REDTAIL-DOSCONDO[230], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
DOSCONDO-HACKBERY[230], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
HACKBERY-MORENCI[230], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MORENCI-GREEN-AE[230], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] (AEPCO-SRP), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
VALEN-AE-BLACKMTN[115] (AEPCO-CAP), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
RATTLSNK-TWINPEAK[115] (WALC-CAP), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-ED-5[115] (AEPCO-WALC), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-RATTLSNK[115] (AEPCO-WALC), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAG.WEST-ED-5[115] (WALC-APS), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAG.EAST-SAG.WEST[115] (APS), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAG.EAST-ORACLE[115] (WALC-APS), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAG.EAST-ADONIS[115] (AEPCO-APS), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THRNYDLE-ADONIS[115], P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THRNYDLE-RATTLSNK[115] (AEPCO-WALC), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
VALLEYFARMS-ORACLE[115] (WALC), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
TUCSON-ORACLE[115] (WALC), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ORACLE-S.BRKRCH[115] (AEPCO-WALC), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

S.BRKRCH-SNMANUEL[115] (AEPCO-APS), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREEN-AE-GREENLEE[345] (AEPCO-TEP), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
HIDALGO-GREENLEE[345] (TEP), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREENLEE-COPPER_VERDE[345] (TEP), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
VAIL-SOUTH[345] (TEP), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREENLEE-VAIL[345] (TEP), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREENLEE-WINCHESTER[345] (TEP), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CW_POI#1A-GREENLEE[345] (TEP), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345] (AEPCO-TEP), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] (AEPCO-CAP-WALC)), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] (AEPCO-WALC-APS), P1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-AE-APACHE[69/115], P1_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115], P1_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115], P1_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230], P1_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREEN-AE-GREEN-AE[345/230], P1_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] (AEPCO-TEP), P1_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
VAIL-VAIL3WP[345/138] (TEP), P1_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
VAIL-VAIL[345/138] (TEP), P1_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
VAIL-VAIL2[345/138] (TEP), P1_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
Breaker_Fault-APACHE(201) [230], P2_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
Breaker_Fault-APACHE(202) [230], P2_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
Breaker_Fault-APACHE(204) [230], P2_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
Breaker_Fault-APACHE(205) [230], P2_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
Breaker_Fault-APACHE(207) [230], P2_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
Breaker_Fault-APACHE(210) [230], P2_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
Breaker_Fault-APACHE(211) [230], P2_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
Breaker_Fault-BICKNELL(202) [230], P2_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
Breaker_Fault-BICKNELL(204) [230], P2_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
Breaker_Fault-BICKNELL(205) [230], P2_3	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MainBusFault-APACHE [115], P2_4	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MainBusFault-BICKNELL [115], P2_4	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | APACHE-APACHE[230/115], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | APACHE-BUTERFLD[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | APACHE-REDTAIL[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

APACHE-HAYDENAZ[115] | APACHE-WINCHESTER[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | BUTERFLD-PANTANO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | BUTERFLD-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | WINCHESTER-WINCHESTER[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | AVRA-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | MARANA-AVRA[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | SAHUARIT-BICKNELL[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | BICKNELL-BICKNELL[230/115], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | BICKNELL-BICKNELL[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | BICKNELL-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | BICKNELL-THREEPNT[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | MARANA-ED-5[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | MARANA-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | THRNYDLE-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | THRNYDLE-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | SAG.EAST-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | GREENLEE-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

APACHE-HAYDENAZ[115] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | APACHE-BUTERFLD[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | APACHE-REDTAIL[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | APACHE-WINCHESTER[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | BUTERFLD-PANTANO[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | BUTERFLD-SCHIEFFELIN[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | WINCHESTER-WINCHESTER[345/230], P6_2_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | AVRA-SNDARIO[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | MARANA-AVRA[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | SAHUARIT-BICKNELL[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | BICKNELL-BICKNELL[230/115], P6_2_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | BICKNELL-BICKNELL[345/230], P6_2_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | BICKNELL-VAIL[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | BICKNELL-THREEPNT[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | MARANA-ED-5[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | MARANA-RATTLSNK[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | THREEPNT-VALEN-AE[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | THREEPNT-SNDARIO[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | NEWTUCSN-SAHUARIT[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | PANTANO-NEWTUCSN[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | THRNYDLE-ADONIS[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | THRNYDLE-RATTLSNK[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | SAG.EAST-ADONIS[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | REDTAIL-DOSCONDO[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | SAN_RAF-SCHIEFFELIN[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | GREENLEE-WINCHESTER[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | GREEN-AE-GREENLEE[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | GREENLEE-VAIL[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

APACHE-APACHE[230/115]	GREEN-AE-GREEN-AE[345/230], P6_2_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115]	MORENCI-GREEN-AE[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115]	HACKBERY-MORENCI[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115]	DOSCONDO-HACKBERY[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115]	APACHE-APACHE[230/115], P6_2_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	APACHE-REDTAIL[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	APACHE-WINCHESTER[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	BUTERFLD-PANTANO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	BUTERFLD-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	WINCHESTER-WINCHESTER[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	AVRA-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	MARANA-AVRA[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	SAHUARIT-BICKNELL[230], P6_1_1	DIV	DIV	DIV	DIV	DIV
APACHE-BUTERFLD[230]	BICKNELL-BICKNELL[230/115], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	BICKNELL-BICKNELL[345/230], P6_1_2	DIV	DIV	DIV	DIV	DIV
APACHE-BUTERFLD[230]	BICKNELL-VAIL[345], P6_1_1	DIV	DIV	DIV	DIV	DIV
APACHE-BUTERFLD[230]	BICKNELL-THREEPNT[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	MARANA-ED-5[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	MARANA-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	THRNYDLE-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	THRNYDLE-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	SAG.EAST-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230]	SAN_RAF-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

APACHE-BUTERFLD[230] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230] | GREENLEE-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | APACHE-WINCHESTER[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | BUTERFLD-PANTANO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | BUTERFLD-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | WINCHESTER-WINCHESTER[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | AVRA-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | MARANA-AVRA[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | SAHUARIT-BICKNELL[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | BICKNELL-BICKNELL[230/115], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | BICKNELL-BICKNELL[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | BICKNELL-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | BICKNELL-THREEPNT[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | MARANA-ED-5[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | MARANA-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | THRNYDLE-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | THRNYDLE-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | SAG.EAST-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

APACHE-REDTAIL[230] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | GREENLEE-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | BUTERFLD-PANTANO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | BUTERFLD-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | WINCHESTER-WINCHESTER[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | AVRA-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | MARANA-AVRA[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | SAHUARIT-BICKNELL[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | BICKNELL-BICKNELL[230/115], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | BICKNELL-BICKNELL[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | BICKNELL-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | BICKNELL-THREEPNT[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | MARANA-ED-5[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | MARANA-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | THRNYDLE-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | THRNYDLE-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | SAG.EAST-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

APACHE-WINCHESTER[230] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | GREENLEE-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | BUTERFLD-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | WINCHESTER-WINCHESTER[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | AVRA-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | MARANA-AVRA[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | SAHUARIT-BICKNELL[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | BICKNELL-BICKNELL[230/115], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | BICKNELL-BICKNELL[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | BICKNELL-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | BICKNELL-THREEPNT[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | MARANA-ED-5[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | MARANA-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | THRNYDLE-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | THRNYDLE-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | SAG.EAST-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

BUTERFLD-PANTANO[230]	GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230]	GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230]	GREENLEE-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230]	GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230]	MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230]	HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230]	DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | WINCHESTER-WINCHESTER[345/230], P6_1_2		SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230]	AVRA-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230]	MARANA-AVRA[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230]	SAHUARIT-BICKNELL[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230]	BICKNELL-BICKNELL[230/115], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230]	BICKNELL-BICKNELL[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230]	BICKNELL-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230]	BICKNELL-THREEPNT[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230]	MARANA-ED-5[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230]	MARANA-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230]	THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230]	THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230]	NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230]	PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230]	THRNYDLE-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230]	THRNYDLE-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230]	SAGEAST-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230]	REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230]	SAN_RAF-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230]	GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230]	GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

BUTERFLD-SCHIEFFELIN[230] | GREENLEE-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | AVRA-SNDARIO[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | MARANA-AVRA[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | SAHUARIT-BICKNELL[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | BICKNELL-BICKNELL[230/115], P6_2_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | BICKNELL-BICKNELL[345/230], P6_2_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | BICKNELL-VAIL[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | BICKNELL-THREEPNT[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | MARANA-ED-5[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | MARANA-RATTLSNK[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | THREEPNT-VALEN-AE[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | THREEPNT-SNDARIO[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | NEWTUCSN-SAHUARIT[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | PANTANO-NEWTUCSN[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | THRNYDLE-ADONIS[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | THRNYDLE-RATTLSNK[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | SAG.EAST-ADONIS[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | REDTAIL-DOSCONDO[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | SAN_RAF-SCHIEFFELIN[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | GREENLEE-WINCHESTER[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | GREEN-AE-GREENLEE[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | GREENLEE-VAIL[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | GREEN-AE-GREEN-AE[345/230], P6_2_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | MORENCI-GREEN-AE[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

WINCHESTER-WINCHESTER[345/230] | HACKBERY-MORENCI[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | DOSCONDO-HACKBERY[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | MARANA-AVRA[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | SAHUARIT-BICKNELL[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | BICKNELL-BICKNELL[230/115], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | BICKNELL-BICKNELL[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | BICKNELL-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | BICKNELL-THREEPNT[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | MARANA-ED-5[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | MARANA-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | THRNYDLE-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | THRNYDLE-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | SAG.EAST-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | GREENLEE-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | SAHUARIT-BICKNELL[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | BICKNELL-BICKNELL[230/115], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

MARANA-AVRA[115] | BICKNELL-BICKNELL[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | BICKNELL-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | BICKNELL-THREEPNT[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | MARANA-ED-5[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | MARANA-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | THRNYDLE-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | THRNYDLE-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | SAG.EAST-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | GREENLEE-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | BICKNELL-BICKNELL[230/115], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | BICKNELL-BICKNELL[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | BICKNELL-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | BICKNELL-THREEPNT[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | MARANA-ED-5[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | MARANA-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

SAHUARIT-BICKNELL[230] | THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | THRNYDLE-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | THRNYDLE-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | SAG.EAST-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | GREENLEE-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | BICKNELL-BICKNELL[345/230], P6_2_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | BICKNELL-VAIL[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | BICKNELL-THREEPNT[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | MARANA-ED-5[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | MARANA-RATTLSNK[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | THREEPNT-VALEN-AE[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | THREEPNT-SNDARIO[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | NEWTUCSN-SAHUARIT[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | PANTANO-NEWTUCSN[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | THRNYDLE-ADONIS[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | THRNYDLE-RATTLSNK[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | SAG.EAST-ADONIS[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | REDTAIL-DOSCONDO[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

BICKNELL-BICKNELL[230/115]	SAN_RAF-SCHIEFFELIN[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115]	GREENLEE-WINCHESTER[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115]	GREEN-AE-GREENLEE[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115]	GREENLEE-VAIL[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115]	GREEN-AE-GREEN-AE[345/230], P6_2_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115]	MORENCI-GREEN-AE[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115]	HACKBERY-MORENCI[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115]	DOSCONDO-HACKBERY[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115]	BICKNELL-BICKNELL[230/115], P6_2_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230]	BICKNELL-VAIL[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230]	BICKNELL-THREEPNT[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230]	MARANA-ED-5[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230]	MARANA-RATTLSNK[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230]	THREEPNT-VALEN-AE[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230]	THREEPNT-SNDARIO[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230]	NEWTUCSN-SAHUARIT[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230]	PANTANO-NEWTUCSN[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230]	THRNYDLE-ADONIS[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230]	THRNYDLE-RATTLSNK[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230]	SAG.EAST-ADONIS[115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230]	REDTAIL-DOSCONDO[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230]	SAN_RAF-SCHIEFFELIN[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230]	GREENLEE-WINCHESTER[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230]	GREEN-AE-GREENLEE[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230]	GREENLEE-VAIL[345], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230]	GREEN-AE-GREEN-AE[345/230], P6_2_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230]	MORENCI-GREEN-AE[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230]	HACKBERY-MORENCI[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

BICKNELL-BICKNELL[345/230]	DOSCONDO-HACKBERY[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345]	BICKNELL-THREEPNT[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345]	MARANA-ED-5[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345]	MARANA-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345]	THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345]	THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345]	NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345]	PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345]	THRNYDLE-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345]	THRNYDLE-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345]	SAG.EAST-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345]	REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345]	SAN_RAF-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345]	GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345]	GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345]	GREENLEE-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345]	GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345]	MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345]	HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345]	DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115]	MARANA-ED-5[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115]	MARANA-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115]	THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115]	THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115]	NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115]	PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115]	THRNYDLE-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115]	THRNYDLE-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

BICKNELL-THREEPNT[115] | SAG.EAST-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | GREENLEE-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-ED-5[115] | MARANA-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-ED-5[115] | THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-ED-5[115] | THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-ED-5[115] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-ED-5[115] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-ED-5[115] | THRNYDLE-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-ED-5[115] | THRNYDLE-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-ED-5[115] | SAG.EAST-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-ED-5[115] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-ED-5[115] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-ED-5[115] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-ED-5[115] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-ED-5[115] | GREENLEE-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-ED-5[115] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-ED-5[115] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-ED-5[115] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-ED-5[115] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-RATTLSNK[115] | THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

MARANA-RATTLSNK[115]	THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-RATTLSNK[115]	NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-RATTLSNK[115]	PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-RATTLSNK[115]	THRNYDLE-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-RATTLSNK[115]	THRNYDLE-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-RATTLSNK[115]	SAG.EAST-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-RATTLSNK[115]	REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-RATTLSNK[115]	SAN_RAF-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-RATTLSNK[115]	GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-RATTLSNK[115]	GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-RATTLSNK[115]	GREENLEE-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-RATTLSNK[115]	GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-RATTLSNK[115]	MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-RATTLSNK[115]	HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-RATTLSNK[115]	DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115]	THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115]	NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115]	PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115]	THRNYDLE-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115]	THRNYDLE-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115]	SAG.EAST-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115]	REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115]	SAN_RAF-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115]	GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115]	GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115]	GREENLEE-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115]	GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115]	MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

THREEPNT-VALEN-AE[115] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-VALEN-AE[115] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | THRNYDLE-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | THRNYDLE-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | SAG.EAST-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | GREENLEE-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THREEPNT-SNDARIO[115] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230] | THRNYDLE-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230] | THRNYDLE-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230] | SAG.EAST-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230] | GREENLEE-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
NEWTUCSN-SAHUARIT[230] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

NEWTUCSN-SAHUARIT[230] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
PANTANO-NEWTUCSN[230] | THRNYDLE-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
PANTANO-NEWTUCSN[230] | THRNYDLE-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
PANTANO-NEWTUCSN[230] | SAG.EAST-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
PANTANO-NEWTUCSN[230] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
PANTANO-NEWTUCSN[230] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
PANTANO-NEWTUCSN[230] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
PANTANO-NEWTUCSN[230] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
PANTANO-NEWTUCSN[230] | GREENLEE-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
PANTANO-NEWTUCSN[230] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
PANTANO-NEWTUCSN[230] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
PANTANO-NEWTUCSN[230] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
PANTANO-NEWTUCSN[230] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THRNYDLE-ADONIS[115] | THRNYDLE-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THRNYDLE-ADONIS[115] | SAG.EAST-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THRNYDLE-ADONIS[115] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THRNYDLE-ADONIS[115] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THRNYDLE-ADONIS[115] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THRNYDLE-ADONIS[115] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THRNYDLE-ADONIS[115] | GREENLEE-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THRNYDLE-ADONIS[115] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THRNYDLE-ADONIS[115] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THRNYDLE-ADONIS[115] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THRNYDLE-ADONIS[115] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THRNYDLE-RATTLSNK[115] | SAG.EAST-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THRNYDLE-RATTLSNK[115] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THRNYDLE-RATTLSNK[115] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THRNYDLE-RATTLSNK[115] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

THRNYDLE-RATTLSNK[115] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THRNYDLE-RATTLSNK[115] | GREENLEE-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THRNYDLE-RATTLSNK[115] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THRNYDLE-RATTLSNK[115] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THRNYDLE-RATTLSNK[115] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
THRNYDLE-RATTLSNK[115] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAG.EAST-ADONIS[115] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAG.EAST-ADONIS[115] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAG.EAST-ADONIS[115] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAG.EAST-ADONIS[115] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAG.EAST-ADONIS[115] | GREENLEE-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAG.EAST-ADONIS[115] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAG.EAST-ADONIS[115] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAG.EAST-ADONIS[115] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAG.EAST-ADONIS[115] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
REDTAIL-DOSCONDO[230] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
REDTAIL-DOSCONDO[230] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
REDTAIL-DOSCONDO[230] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
REDTAIL-DOSCONDO[230] | GREENLEE-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
REDTAIL-DOSCONDO[230] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
REDTAIL-DOSCONDO[230] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
REDTAIL-DOSCONDO[230] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
REDTAIL-DOSCONDO[230] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAN_RAF-SCHIEFFELIN[230] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAN_RAF-SCHIEFFELIN[230] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAN_RAF-SCHIEFFELIN[230] | GREENLEE-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAN_RAF-SCHIEFFELIN[230] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAN_RAF-SCHIEFFELIN[230] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

SAN_RAF-SCHIEFFELIN[230] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAN_RAF-SCHIEFFELIN[230] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREENLEE-WINCHESTER[345] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREENLEE-WINCHESTER[345] | GREENLEE-VAIL[345], P6_1_1	DIV	DIV	DIV	DIV	DIV
GREENLEE-WINCHESTER[345] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREENLEE-WINCHESTER[345] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREENLEE-WINCHESTER[345] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREENLEE-WINCHESTER[345] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREEN-AE-GREENLEE[345] | GREENLEE-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREEN-AE-GREENLEE[345] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREEN-AE-GREENLEE[345] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREEN-AE-GREENLEE[345] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREEN-AE-GREENLEE[345] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREENLEE-VAIL[345] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREENLEE-VAIL[345] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREENLEE-VAIL[345] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREENLEE-VAIL[345] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREEN-AE-GREEN-AE[345/230] | MORENCI-GREEN-AE[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREEN-AE-GREEN-AE[345/230] | HACKBERY-MORENCI[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
GREEN-AE-GREEN-AE[345/230] | DOSCONDO-HACKBERY[230], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MORENCI-GREEN-AE[230] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MORENCI-GREEN-AE[230] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
HACKBERY-MORENCI[230] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | ADAMS_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | APACHE-APACHE[230/115], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | APACHE-BUTERFLD[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | APACHE-REDTAIL[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | APACHE-WINCHESTER[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

ADAMS_Group [115] | BUTERFLD-PANTANO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | BUTERFLD-SCHIEFFELIN[230], P6_1_1	DIV	DIV	DIV	DIV	DIV
ADAMS_Group [115] | WINCHESTER-WINCHESTER[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | AVRA-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | MARANA-AVRA[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | SAHUARIT-BICKNELL[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | BICKNELL-BICKNELL[230/115], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | BICKNELL-BICKNELL[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | BICKNELL-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | BICKNELL-THREEPNT[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | MARANA-ED-5[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | MARANA-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | THRNYDLE-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | THRNYDLE-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | SAG.EAST-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | GREENLEE-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
ADAMS_Group [115] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

ADAMS_Group [115] | CAP_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-APACHE[230/115] | CAP_Group [115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-HAYDENAZ[115] | CAP_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
WINCHESTER-WINCHESTER[345/230] | CAP_Group [115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
AVRA-SNDARIO[115] | CAP_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
MARANA-AVRA[115] | CAP_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
SAHUARIT-BICKNELL[230] | CAP_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[230/115] | CAP_Group [115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-BICKNELL[345/230] | CAP_Group [115], P6_2_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-VAIL[345] | CAP_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BICKNELL-THREEPNT[115] | CAP_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-BUTERFLD[230] | CAP_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-REDTAIL[230] | CAP_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
APACHE-WINCHESTER[230] | CAP_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-PANTANO[230] | CAP_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
BUTERFLD-SCHIEFFELIN[230] | CAP_Group [115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | THREEPNT-VALEN-AE[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | THREEPNT-SNDARIO[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | NEWTUCSN-SAHUARIT[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | PANTANO-NEWTUCSN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | THRNYDLE-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | THRNYDLE-RATTLSNK[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | SAG.EAST-ADONIS[115], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | REDTAIL-DOSCONDO[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | SAN_RAF-SCHIEFFELIN[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | GREENLEE-WINCHESTER[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | GREEN-AE-GREENLEE[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | GREENLEE-VAIL[345], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

CAP_Group [115] | GREEN-AE-GREEN-AE[345/230], P6_1_2	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | MORENCI-GREEN-AE[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | HACKBERY-MORENCI[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED
CAP_Group [115] | DOSCONDO-HACKBERY[230], P6_1_1	SOLVED	SOLVED	SOLVED	SOLVED	SOLVED

Voltage Reports

No voltages found to exceed limits.

Thermal Loading Reports

No thermal ratings found to be exceeded.

Appendix D – Short Circuit Analysis

The short circuit analysis portion of this assessment was performed for the year 2021. The results indicate AEPCO's circuit breakers are capable of interrupting expected fault currents from all fault types and do not exceed their equipment ratings. The table below indicates the maximum fault current at each bus following either a 3LG, 2LG, 1LG, or L-L fault.

Bus	kV	Maximum Fault (Amps)	Min. Breaker Interrupt Rating (Amps)	Max % Loading
APACHE	230	13874.7	40000	**35%**
APACHE	115	15076	40000	**38%**
APACHE	69	10134.4	19000	**53%**
AVRA	115	4518.8	40000	**11%**
BICKNELL	115	8062.6	20000	**40%**
BICKNELL	230	6049.3	40000	**15%**
BUTTERFIELD	230	7160.5	40000	**18%**
DOS CONDODOS	230	4878.7	40000	**12%**
GREENLEE	230	6208.7	40000	**16%**
GREENLEE	345	15733.3	50000	**31%**
HACKBERRY	230	5028	40000	**13%**
KARTCHNR	115	1530.5	40000	**4%**
KARTCHNR	69	2255.2	19000	**12%**
MARANA	115	5684.8	20000	**28%**
MORENCI	230	5696.8	40000	**14%**
NEW TUCSON	230	4714.4	40000	**12%**
PANTANO	115	4082.4	20000	**20%**
REDTAIL	230	5936.2	40000	**15%**
REDTAIL	69	4808.1	21000	**23%**
RIVIERA	69	10586.4	19000	**56%**
SAHUARITA	230	5057.1	40000	**13%**
SAN RAFAEL	230	2810.5	40000	**7%**
SAN RAFAEL	69	4265.4	40000	**11%**
SANDARIO	115	4024.6	40000	**10%**
THREE POINTS	115	4862.9	40000	**12%**

Bus	kV	Maximum Fault (Amps)	Min. Breaker Interrupt Rating (Amps)	Max % Loading
TOPOCK	230	14555.6	40000	**36%**
TOPOCK	69	10451.6	40000	**26%**
VALENCIA	115	4057.8	40000	**10%**
WINCHESTER	230	10129.1	40000	**25%**

Appendix E – Transient Stability Analysis

For the transient stability portion of this assessment, AEPCO performed studies simulating the Near-Term and Long-Term planning horizons (2022 and 2030). The results of this analysis (Full plot results available upon request) found AEPCO's BES to meet performance requirements.

Contingency Events and Rationale

AEPCO created an additional contingency list for its transient stability analysis. The classification of these system contingencies were performed according to the NERC TPL-001-4 Table 1 – "*Steady State and Stability Performance Planning Events.*" The list contains contingencies which were identified to produce the most severe system impacts on AEPCO's portion of the BES.

The contingencies selected for this analysis are based around the major "nodes" relevant to AEPCO's portion of the BES. These "nodes" include locations such as interconnection points with adjacent entities and impactful locations near AEPCO's generation facilities. The list indicates the bus location of the simulated three-phase fault, as well as the subsequent contingency following a four-cycle clearing time. The complete list of contingencies simulated can be found on the following page.

1. **"Apache-Butterfield [230] P1_2"**
   Fault "APACHE 230"
   Line "APACHE 230" "BUTERFLD 230" "1"
2. **"Apache-Redtail [230] P1_2"**
   Fault "APACHE 230"
   Line "APACHE 230" "REDTAIL 230" "1"
3. **"Apache-Winchester [230] P1_2"**
   Fault "APACHE 230"
   Line "APACHE 230" "WINCHESTER 230" "1"
4. **"Marana Group [115] P1_2"**
   Fault "MARANA 115"
   Line "MARANATAP 115" "MARANA 115" "1"
   Line "MARANATAP 115" "ED-5 115" "1"
   Line "MARANATAP 115" "RATTLSNK 115" "1"
5. **"Bicknell [345/230], P1_3"**
   Fault "BICKNELL 345"
   Xfmr "BICKNELL 345" "BICKNELL 230" "1"
6. **"Greenlee [345/230], P1_3"**
   Fault "GREEN-AE 345"
   Xfmr "GREEN-AE 345" "GREEN-AE 230" "1"
7. **"Apache [69/115] P1_3"**
   Fault "APACHE 69"
   Xfmr "APACHE-AE 69" "APACHE 115" "1"
8. **" MainBusFault-Apache [115] P2_2"**
   Fault "APACHE 115"
   Xfmr "APACHE 230" "APACHE 115" "1"
   Xfmr "APACHE 230" "APACHE 115" "2"
   Xfmr "APACHE 115" "APACH-ST-1 13.8" "1"
   Gen "APACH-ST-1 13.8" "1"
   Xfmr "APACHE 115" "APACH-CT-3 13.8" "1"
   Gen"APACH-CT-3 13.8" "1"
   Xfmr "APACHE-AE 69" "APACHE 115" " "
   Line "APACHE 115" "HAYDENAZ 115" "1"
   Line "ADAMSTAP 115" "APACHE 115" "1"
   Line "ADAMSTAP 115" "NOGALES 115" "1"
   Line "ADAMS 115" "ADAMSTAP 115" "1

Arizona G&T Cooperatives

Touchstone Energy® Cooperatives

TEN-YEAR TRANSMISSION PLAN

2021 – 2030

Docket No. E-~~00000D-19-0007~~

99999 A-21-0009

January 2021

ARIZONA ELECTRIC POWER COOPERATIVE, INC.

TEN-YEAR TRANSMISSION PLAN

2021 – 2030

Prepared for the

ARIZONA CORPORATION COMMISSION

Docket No. E-00000D-19-0007

TABLE OF CONTENTS

General Information

This Ten-Year Transmission Plan is being submitted to the Arizona Corporation Commission (ACC) to satisfy the requirements of § 40-360.02 of the Arizona Revised Statutes (A.R.S.), relating to power plant and transmission line siting requirements. It outlines the plans of Arizona Electric Power Cooperative, Inc. (AEPCO) to install electric facilities required to reliably meet the system load growth of its Distribution Cooperative Members (Members) and other network customers or reliability requirements applicable to AEPCO's transmission system.

This report contains transmission projects that AEPCO anticipates may be constructed over the next ten-year period. As noted in A.R.S. § 40-360.02.F, the plans contained in this report are tentative information only and are subject to change at any time at the discretion of AEPCO. AEPCO anticipates that any changes to this plan will likely be due to changes in load forecasts, environmental constraints, economic considerations, other utilities' plans, regulatory and legal developments, as well as future regional and federal mandates. All transmission projects are subject to a peer-review by AEPCO's Operating Committee (OC) before submittal to the AEPCO Board of Directors for approval. Meetings of the OC are held quarterly, or as needed, and changes to these projects are reviewed as necessary to meet the Member's needs. The OC reviews the Construction Work Plan (CWP) that is then submitted to the AEPCO Board of Directors for approval. Once the CWP is approved, the projects are considered by AEPCO as "planned" projects. Projects that have not been vetted by the OC for placement into a CWP, may be included in ten-year plan filings but will be listed as "conceptual" projects with tentative or "to-be-determined" (TBD) in-service dates. TBD, as used in this document, means that in addition to the project not being yet vetted by the OC, it can also mean that the project is still in negotiations with other entities.

This specific report is divided into two sections, as outlined in the table of contents. Section I describes planned transmission lines and projects AEPCO may construct over the ten-year plan period. Section II contains AEPCO's internal planning criteria and facility ratings, according to Commission Decision #63876, dated July 25, 2001.

A technical study report to satisfy the requirements of paragraph C.7 of A.R.S. §40-360.02 has been prepared as a stand-alone document and will be filed jointly with this document.

Regional Planning

AEPCO has been an active participant in regional and sub-regional transmission planning efforts within the Western Interconnection for many years. This participation has been through membership in the Western Electricity Coordinating Council (WECC), WestConnect (WC), and Southwest Area Transmission (SWAT). AEPCO is an active participant within the following committees of WECC:

- Reliability Assessment Committee (RAC)
- Operating Committee (OC)
- System Review Subcommittee (SRS)

AEPCO will continue to be involved in regional planning through WC and SWAT and the Western Interconnection with representation in the RAC, OC, SRS, and any other subcommittees and task forces created in conjunction with WECC as necessary.

AEPCO continues its involvement in the regional transmission planning activities of WC as a Coordinating Transmission Owner (TO) in the TO with Load Serving Obligations Sector. WC coordinates its efforts with other regional planning entities and inter-regionally within the Western Interconnection, to comply with the provisions of the Federal Energy Regulatory Commission (FERC) Order No. 1000 "Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities" that was issued July 21, 2011.

The Planning Management Committee (PMC) under the Planning Participation Agreement (PPA) that was filed on November 17, 2014, is responsible for development of a Regional Transmission Study Plan, development of an annual budget for the regional and inter-regional planning processes, activities, functions, development of planning models, identification of regional transmission needs, submittal of projects to meet regional transmission needs, identification of beneficiaries, and cost allocation.

Projects Overview

On October 8, 2020, AEPCO's Board of Directors approved the 2021-2024 CWP. The CWP identified several projects that will be included in this year's Ten-Year Plan as planned projects. Projects with projected in-service dates outside of the current CWP window with a high likelihood of construction will be included as planned projects in this report. Additional projects proposed after the approval of the current CWP will be included in this document. Projects holding a higher degree of uncertainty with no firm in-service dates will be included as "Additional Projects under Consideration."

Completed Projects

Arizona Public Service (APS) Bagdad Interconnection Project: This project expands AEPCO's Bagdad Substation and Interconnect. The expansion includes the installation of a 115/69 kV transformer, 115 kV breaker, switches, and one-mile of 115 kV transmission line to intersect APS' Willow Lake – Bagdad 115 kV line. This connection will provide mutual backup for APS' loads in the town of Bagdad, as well as Mohave Electric Cooperative Inc.'s (MEC) loads west of Bagdad.

Valencia to Central Arizona Project (CAP) Black Mountain 115 kV Line: This line segment was approved by the ACC Line Siting Committee on February 10, 2010, and by the Commission on April 14, 2010 (Case #152, Decision #71649), as part of the North Loop to Rattlesnake 115 kV Line Project. This project involved the installation of a 2.6-mile 115 kV line interconnection between AEPCO and CAP. This line extends from the existing AEPCO Valencia Substation to tie into the turning structure of the 115 kV CAP line that heads directly north two miles to the existing CAP Black Mountain Substation. This project also included the installation of a sectionalizing breaker at Western's Rattlesnake Substation and a 14.4 MVA capacitor bank at the Valencia Substation.

Hereford – Palominas 69 kV Line: This project included the construction of a 69 kV transmission line interconnection between SSVEC's Hereford and APS' Palominas Substation. The connection provides mutal backup and is operated normally open.

Planned Projects

Fort Huachuca – Kartchner Interconnection: This project will connect AEPCO's 69 kV Kartchner Substation to TEP's 138 kV system at Fort Huachuca with the installation of a new 4.5-mile 69 kV transmission line. AEPCO, Fort Huachuca, and TEP are currently in discussions of the project agreement. The driving factor for this project is reliability. The projected in-service date is 2022.

Schieffelin Project: This Cochise County Project includes looping the AEPCO Butterfield to San Rafael 230 kV line into a new substation (Schieffelin) with a 230/69 kV transformation and connection to the existing Sulphur Springs Valley Electric Cooperative, Inc.'s (SSVEC) Tombstone Junction and St. David Substations. Schieffelin Substation will also be connected to APS' Boothill Substation by a 10.4-mile 69 kV line. The driving factor for this project is reliability. The projected in-service date is 2022.

Saguaro/Thornydale/(Rattlesnake)/Marana Interconnection: This project ultimately involves a 115 kV interconnection between APS' Saguaro Substation and AEPCO's Marana Substation and construction of a new Adonis 115 kV Substation in 2023. This project will be completed in several phases, starting with Phase 1 in 2022 involving the 115 kV interconnection between Thoryndale and Saguaro. Phase 2, projected for 2023, involves the new Adonis Substation. Finally, Phase 3 projected for 2024, includes a 115 kV interconnection between Thoryndale and Marana with a potential Rattlesnake interconnection. Currently, this project is undergoing additional discussions with neighboring utilities. The driving factor for this project is reliability. The overall projected in-service date is 2024.

Marana Substation Rebuild: This project is a rebuild of the Marana Substation in order to accept direct connections from the looped-in Western Area Power Administration (WAPA) Electrical District 5 (ED5) – Rattlesnake 115 kV transmission line. Currently, the ED5 – Rattlesnake line is looped in through a tap configuration, this rebuild intends to remove the tap configuration as well as any additional substation work required. The driving factor for this project is reliability. The projected in-service date is 2024.

Additional Projects under Consideration

AEPCO continues to study the feasibility of additional projects for inclusion into future Ten-Year Plans that have been deferred from previous Ten-Year Plans, for various reasons.

A brief description of each of these projects is for informational purposes only. A driving factor is provided for each of these projects per the ACC's Biennial Transmission Assessment recommendations. These projects are under consideration but have not advanced far enough to have a projected in-service date.

AEPCO will continue to hold discussions with potential project participants throughout 2020, and if refined project scopes have been established with agreements from project participants, and with approvals from governing boards, these projects may be reflected in the next Ten-Year Plan.

Apache/Hayden to San Manuel 115 kV Line: This project has been presented in previous AEPCO Ten-Year Plans, but has been deferred beyond the Ten-Year Plan horizon. It was approved by the ACC on June 26, 2018 (Decision #76765). This project proposes the installation of a 4.5-mile 115 kV line from the existing AEPCO Apache to Hayden 115 kV line to the existing APS San Manuel Substation. Recently, this project was under study as a result of a large generator interconnection request to APS and is being re-evaluated by AEPCO and APS. This project will require an agreement with APS and additional studies. The driving factor for this project is reliability.

AEPCO Transmission System and Project Maps

The following maps are included to show the location of existing and future transmission projects, and as presented in the earlier Planned Projects section. The planned additions of AEPCO's Members are not included on these maps or reflected in this filing.

The maps included in this report are:

Figure 1 – AEPCO Northern Area

Figure 2 – AEPCO Southern Area

Figure 3 – AEPCO Western Area

Figure 4 – AEPCO California and Northwest Arizona Areas

Figure 1

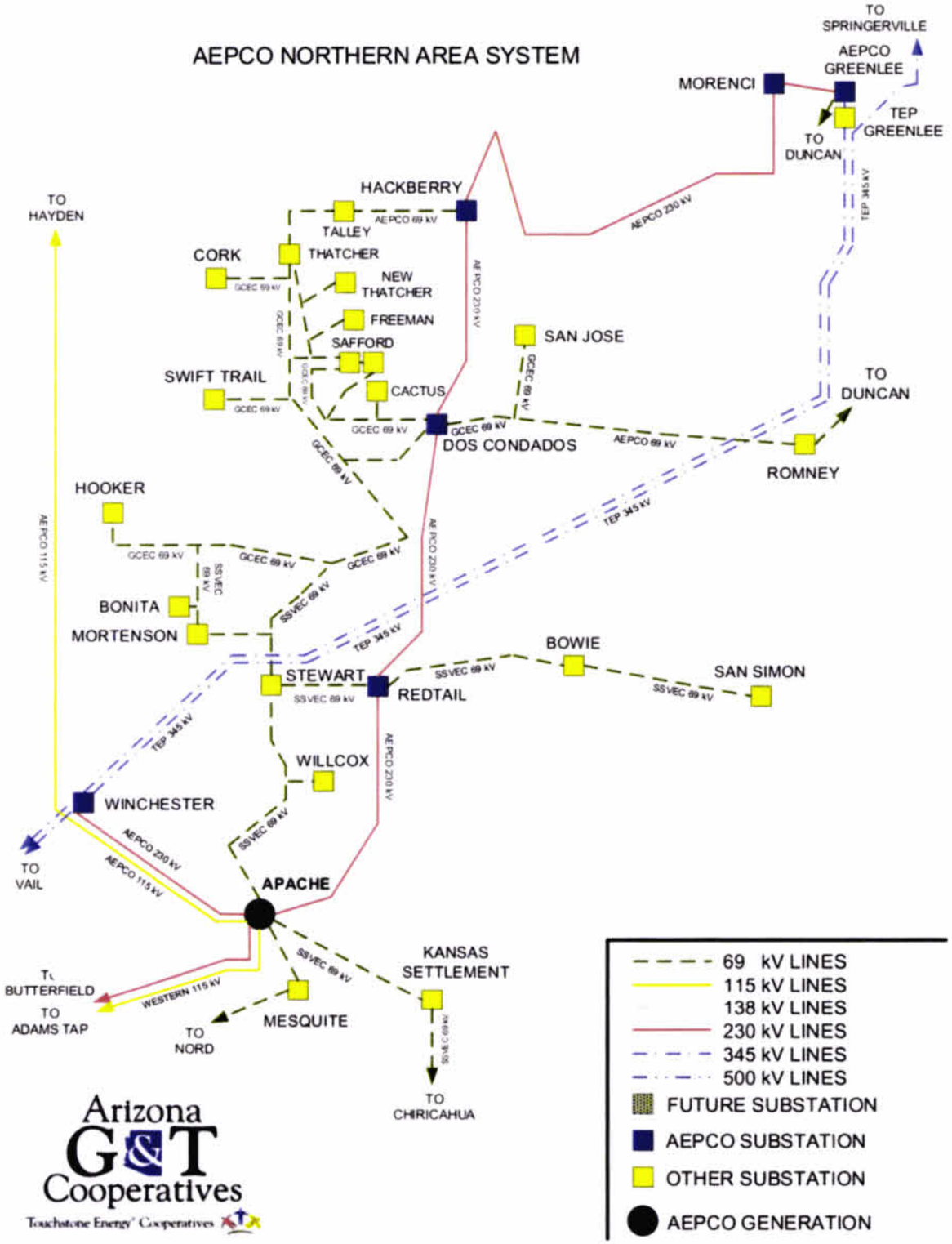

AEPCO NORTHERN AREA SYSTEM
TO SPRINGERVILLE
AEPCO GREENLEE
MORENCI
TEP GREENLEE
TO DUNCAN
TEP 345 kV
AEPCO 230 kV
HACKBERRY
TALLEY
AEPCO 69 kV
TO HAYDEN
CORK
THATCHER
NEW THATCHER
FREEMAN
SAFFORD
SWIFT TRAIL
CACTUS
SAN JOSE
GCEC 69 kV
DOS CONDADOS
TO DUNCAN
ROMNEY
HOOKER
BONITA
MORTENSON
SSVEC 69 kV
AEPCO 115 kV
STEWART
REDTAIL
BOWIE
SAN SIMON
WILLCOX
WINCHESTER
TO VAIL
APACHE
TO BUTTERFIELD
TO ADAMS TAP
WESTERN 115 kV
TO NORD
MESQUITE
KANSAS SETTLEMENT
TO CHIRICAHUA
69 kV LINES
115 kV LINES
138 kV LINES
230 kV LINES
345 kV LINES
500 kV LINES
FUTURE SUBSTATION
AEPCO SUBSTATION
OTHER SUBSTATION
AEPCO GENERATION
Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Figure 2

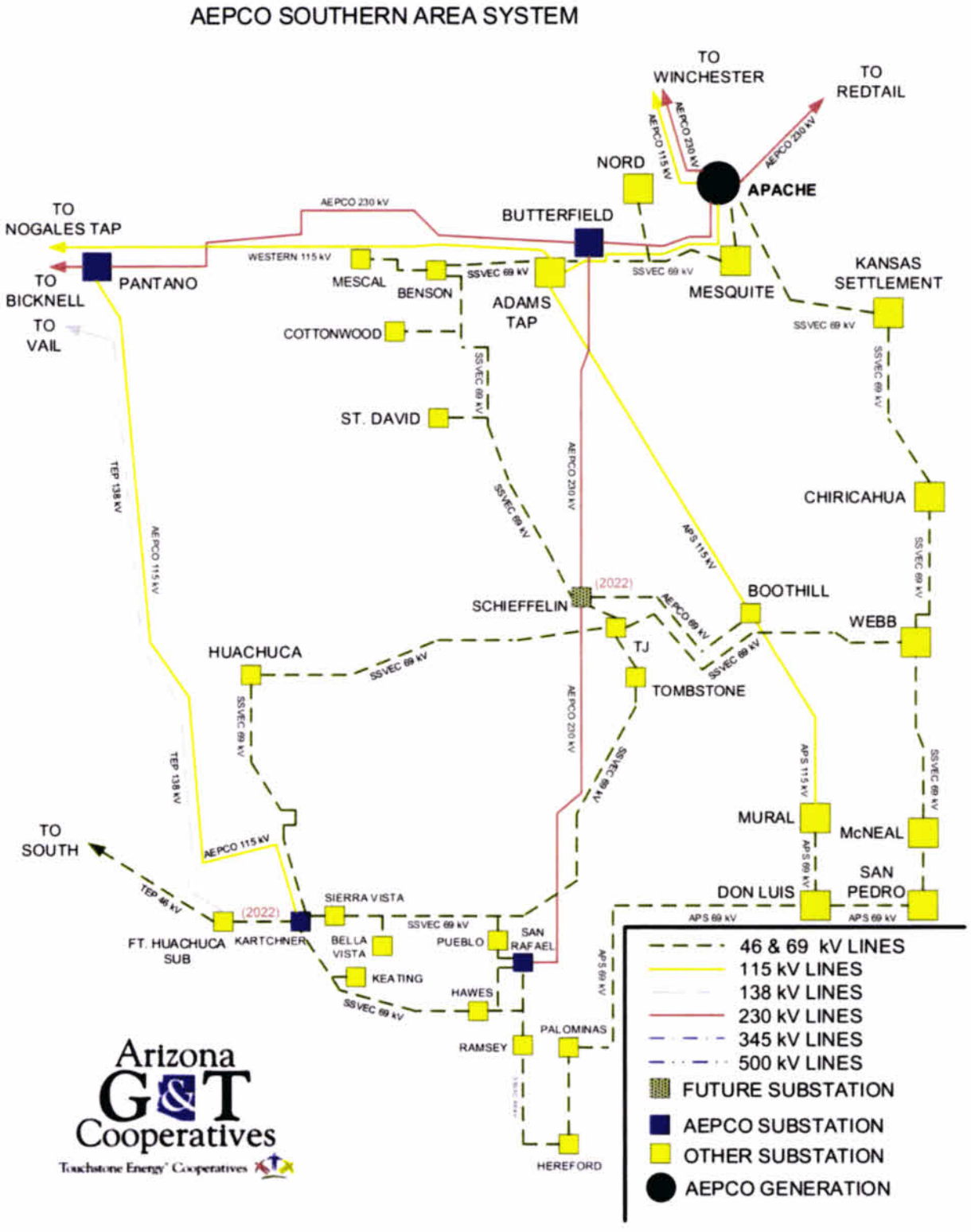
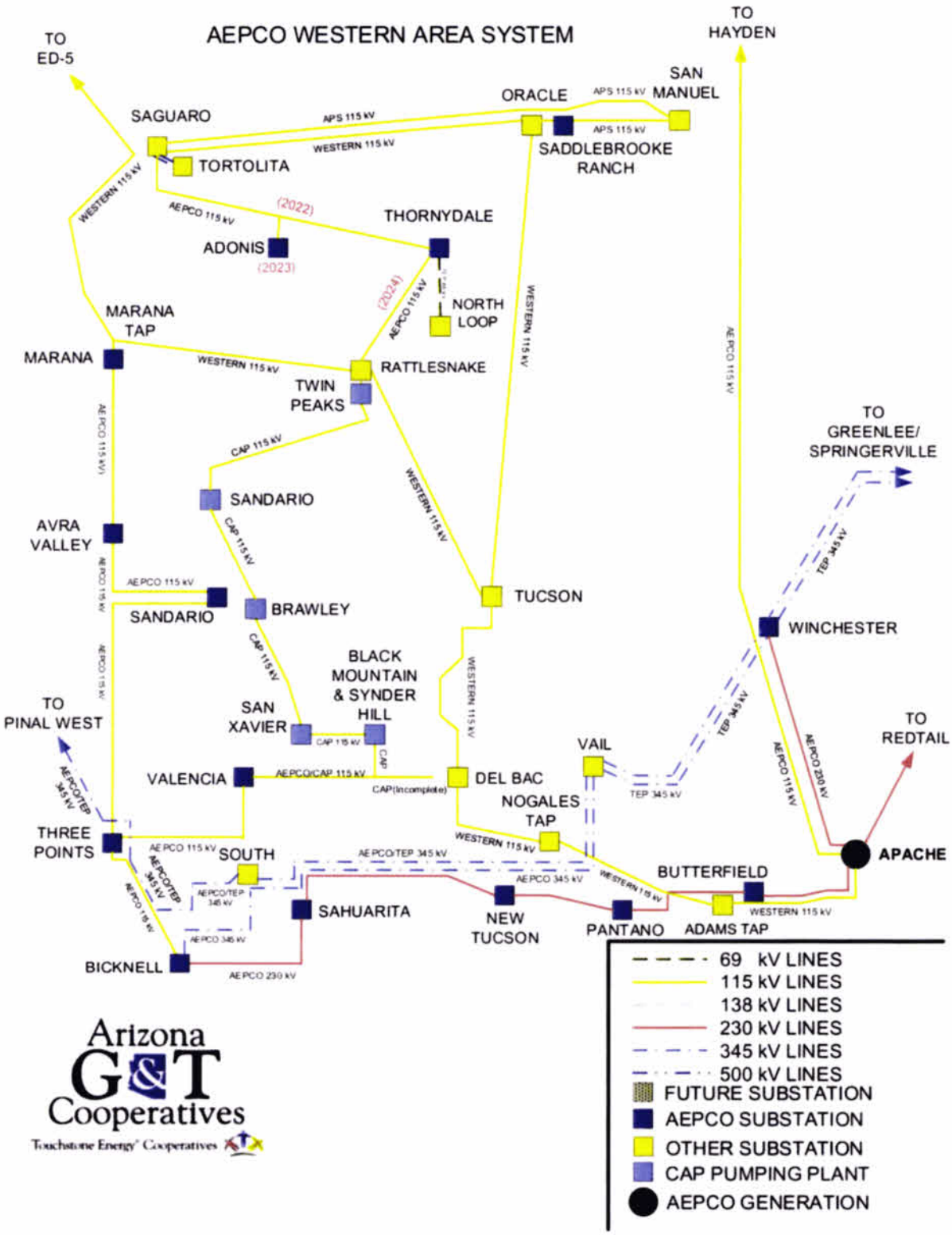

AEPCO SOUTHERN AREA SYSTEM
TO WINCHESTER
TO REDTAIL
AEPCO 230 kV
AEPCO 115 kV
NORD
APACHE
TO NOGALES TAP
BUTTERFIELD
WESTERN 115 kV
MESCAL
BENSON
SSVEC 69 kV
ADAMS TAP
MESQUITE
KANSAS SETTLEMENT
PANTANO
TO BICKNELL
TO VAIL
COTTONWOOD
ST. DAVID
TEP 138 kV
CHIRICAHUA
APS 115 kV
(2022)
SCHIEFFELIN
BOOTHILL
WEBB
TJ
HUACHUCA
TOMBSTONE
TO SOUTH
MURAL
McNEAL
SAN PEDRO
DON LUIS
APS 69 kV
SIERRA VISTA
FT. HUACHUCA SUB
KARTCHNER
BELLA VISTA
PUEBLO
SAN RAFAEL
KEATING
HAWES
PALOMINAS
RAMSEY
HEREFORD
Touchstone Energy® Cooperatives
46 & 69 kV LINES
115 kV LINES
138 kV LINES
230 kV LINES
345 kV LINES
500 kV LINES
FUTURE SUBSTATION
AEPCO SUBSTATION
OTHER SUBSTATION
AEPCO GENERATION

Figure 3



Arizona G&T Cooperatives

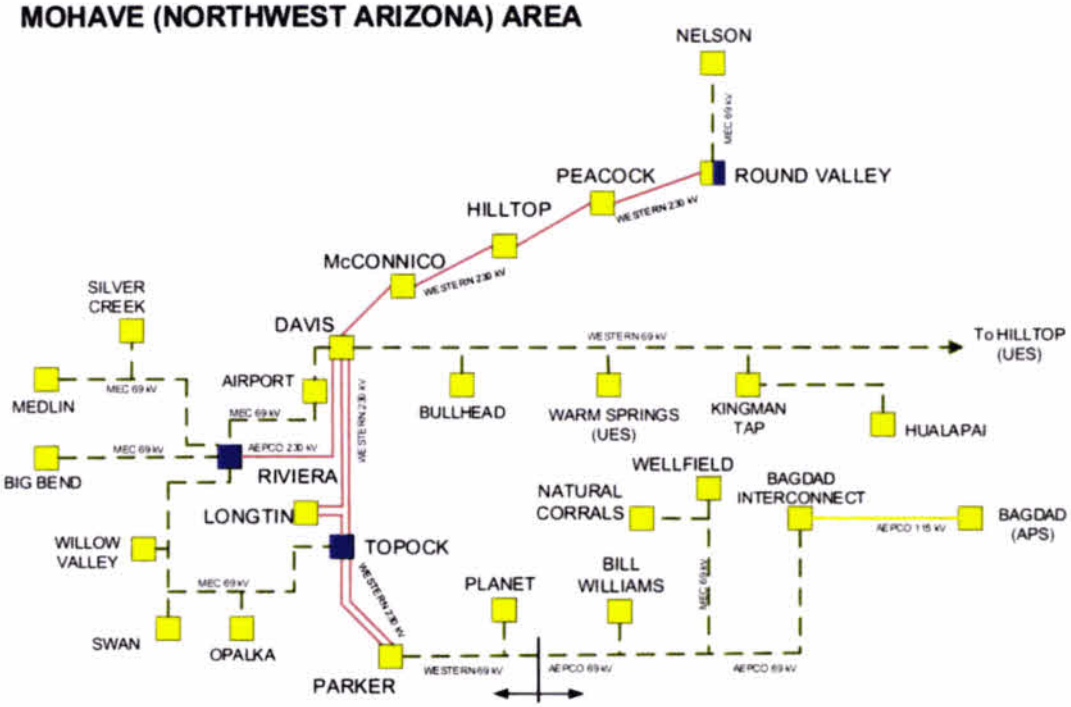
Touchstone Energy® Cooperatives

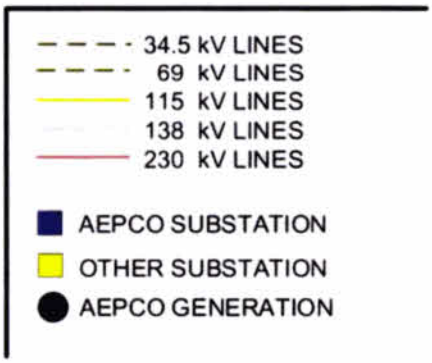
Figure 4

AEPCO CALIFORNIA & NORTHWEST ARIZONA AREA SYSTEMS

ANZA (CALIFORNIA) AREA

MOHAVE (NORTHWEST ARIZONA) AREA





Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Section I – Planned Transmission Projects

Ft. Huachuca-Kartchner Interconnection

Description:

This project will connect AEPCO's 69 kV Kartchner Substation to TEP's 138 kV system at Fort Huachuca with the installation of a new 4.5-mile 69 kV transmission line. AEPCO, Fort Huachuca, and TEP are currently in discussions of the project agreement.

Project Type: Transmission Line and Transformer Installation

Project Location: Fort Huachuca and Kartchner Substations, Cochise County

Justification: Reliability

AEPCO Estimated Cost: $3,180,000

In-Service Date: 2022

Schieffelin Project

Description:

This Cochise County Project includes looping the AEPCO Butterfield to San Rafael 230 kV line into a new substation (Schieffelin) with a 230/69 kV transformation and connection to the existing SSVEC Tombstone Junction and St. David Substations. Schieffelin Substation will also be connected to APS Boothill Substation by a 10.4-mile 69 kV line.

Project Type: Multiple Transmission Elements

Project Location: Cochise County

Justification: Reliability

AEPCO Estimated Cost: $8,000,000

In-Service Date: 2022

Saguaro/Thornydale/(Rattlesnake)/Marana Interconnection

Description:

This project ultimately involves a 115 kV interconnection between APS' Saguaro Substation and AEPCO's Marana Substation and construction of a new Adonis 115 kV Substation in 2023. This project will be completed in several phases, starting with Phase 1 in 2022 involving the 115 kV interconnection between Thoryndale and Saguaro. Phase 2, projected for 2023, involves the new Adonis Substation. Finally, Phase 3 projected for 2024, includes a 115 kV interconnection between Thoryndale and Marana with a potential Rattlesnake interconnection. Currently, this project is undergoing additional discussions with neighboring utilities.

Project Type: Transmission Line Installation

Project Location: Pima County and Pinal County

Justification: Reliability

AEPCO Estimated Cost: TBD

In-Service Date: 2022-2024

Marana Substation Rebuild

Description:

This project is a rebuild of the Marana Substation in order to accept direct connections from the looped-in WAPA ED5 – Rattlesnake 115 kV transmission line and/or AEPCO's line from Thornydale. Currently, the ED5 – Rattlesnake line is looped in through a tap configuration, this rebuild intends to remove the tap configuration as well any additional substation work required.

Project Type: Substation Rebuild

Project Location: Marana Substation

Justification: Reliability

AEPCO Estimated Cost: TBD

In-Service Date: 2024

Section II – Internal Planning Criteria and Facility Ratings

1 Introduction

In accordance with North American Electric Reliability Corporation (NERC) and Western Electricity Coordinating Council (WECC) standards, this document sets forth the Facility Ratings Methodology (FRM) to cover facilities owned by Arizona Electric Power Cooperative, Inc. (AEPCO). This document provides the consistency and methodology for determining its Facility Ratings in planning and operations of the Bulk Electric System (BES) and determines AEPCO's System Operating Limits (SOLs). AEPCO will modify this methodology to comport with accepted industry practice.

AEPCO, identified as NERC ID# NCR05015 in the NERC Compliance Registry, is registered as a Generator Operator (GOP), Generator Owner (GO), Resource Planner (RP), Transmission Owner (TO), Transmission Operator (TOP), Transmission Planner (TP), and Transmission Service Provider (TSP). Through contracts with other entities, this document may identify applicable TOP functions that AEPCO has been delegated regulatory compliance and reporting responsibility.

For the Metropolitan Water District of Southern California's (MWD) Bulk Electric System (BES) Facilities in the AEPCO Transmission Operator (TOP) footprint, MWD determines its Facility Ratings and provides system changes and updates to AEPCO and the California Independent System Operator (CAISO). The MWD equipment ratings are also located in the CAISO Transmission Registry database in which AEPCO and MWD have access. AEPCO will adhere to CAISO Procedure #3100, Establishing System Operating Limits for the Operations Horizon, for Facilities within the CAISO Balancing Authority Area for which AEPCO has TOP operational responsibility.

2 Statement of Limitations

This document is limited to addressing operating conditions under normal and emergency situations and is not intended to address electrical faults, abnormal operations, failures of covered equipment or establish settings for protective devices. Additionally, the document does not make any assumptions as to the design criteria of legacy equipment and facilities.

2.1 The facilities addressed in this document include generators, transmission conductors, transformers, relay protective devices, terminal equipment, and compensation devices.

2.2 This methodology addresses Normal and Emergency ratings that comprise AEPCO's BES Facilities.

2.3 This methodology considers the ratings provided by equipment manufacturers, the Institute of Electrical and Electronics Engineers (IEEE), and American National Standards Institute (ANSI) standards, ambient conditions for solar input, temperature and wind speed, design criteria, operating limitations, and other assumptions, as applicable.

2.4 The ratings for all of AEPCO BES Facilities, including but not limited to generators, lines, transformers, and shunt compensation devices shall respect the most limiting applicable Equipment Rating of the individual equipment that comprises that Facility. [1]

2.5 In cases where a facility is jointly owned, the operator of the facility determines the rating and shares the rating with the other joint owners. AEPCO is a joint owner in two transmission lines: The Vail to Westwing 345 kV line, which it co-owns with Tucson Electric Power (TEP) (project operator), and the Hassayampa to Pinal West 500 kV line, which it co-owns with Electrical District 2 (ED2), Electrical District 3 (ED3), Electrical District 4 (ED4), Salt River Project (SRP) (project operator) and TEP. AEPCO is also a co-owner with TEP (project operator) in the Pinal West 500/345 kV transformer. Information on co-owned facilities is included in Appendices A and B. [2]

2.6 In cases where a facility is owned in segments (such as a transmission line owned by one party with the breaker being owned by a different party), each owner will determine the rating for their segment and coordinate with the others to determine the most limiting segment. The rating for the most limiting segment will be used for the entire facility.[3]

3 System Performance Criteria (SOL Assessment Methodology)

The annual transmission planning assessments that are used to establish SOLs are based on the NERC Transmission System Planning Standards (P0 through P7 Categories) found in Appendix G, and the WECC System Performance Criteria found in Appendix H. This methodology requires that the BES shall demonstrate transient, dynamic and voltage stability and that all facilities shall be within their thermal, voltage and stability limits. The requirements for the pre-Contingency and post-Contingency states are summarized in Sections 3.1 and 3.2 below, and Appendix G.

In the pre-Contingency and post-Contingency states, all normal and emergency thermal facility ratings are used to identify respective SOLs for the planning horizon. These ratings are reflected in the WECC base case database.

When performing simulations to determine SOLs, AEPCO model's category P1 through P7 contingencies. The contingencies that are selected generally include all possible category P1 contingencies on the AEPCO system, as well as a select set of P1 contingencies on neighboring systems and select Category P2 through P7 contingencies on the AEPCO and neighboring systems, These contingencies pertain only to the interconnected transmission system in southeast Arizona that have been previously studied based on sound engineering judgment as having a potential impact on AEPCO and the neighboring systems. Known specific local area protection schemes (LAPS) will be modeled. Radial,

[1] FAC-008-3 R3.3
[2] FAC-008-3 R3
[3] FAC-008-3 R3

coincidental, system facilities of less than 100 kV are not generally modeled in a level of detail as they have been found not to impact the AEPCO system. However, for specific studies involving AEPCO Member Systems, facilities less than 100 kV have been modeled in accordance with NERC and WECC Criteria.

Unless specified otherwise, AEPCO bus voltage limits for any bus in the pre-Contingency and post-Contingency states shall be as noted in Sections 3.1 and 3.2 below. Demand uncertainty margins will be run at 5% for Category P1 and P2 contingencies and 2.5% for Category P3 through P7 contingencies. Transient stability runs will be simulated for at least 10 seconds.

AEPCO bus voltage limits cannot exceed the limits described in the WECC's TPL-001-WECC-CRT-3.1 standard fully described in the AEPCO's most current Transmission Planning Assessment document.

Contingency cases that do not solve will be analyzed to determine the cause of divergence.

AEPCO does not have any Interconnection Reliability Operating Limits (IROLs) anywhere in AEPCO service area. According to RC methodology[4] IROLs are distinguished from SOLs in a few ways (copied from referenced document):

1. An IROL is a subset of SOLs that is associated with instability, uncontrolled separation, or Cascading. SOLs include a broader set of limitations, including Facility Ratings and System Voltage Limits, and certain non-IROL stability limitations.

2. IROL exceedance is associated with heightened risk to the reliability of the BES. The reliability consequences associated with exceeding an IROL are more severe and adversely impactful than the reliability consequences associated with exceeding an SOL that is not an IROL. This distinction is seen in the following:

    a. IROL exceedance is associated with heightened risk to the reliability of the BES. The reliability consequences associated with exceeding an IROL are more severe and adversely impactful than the reliability consequences associated with exceeding an SOL that is not an IROL. This distinction is seen in the following:

    b. While the NERC Reliability Standards require that any SOL exceedance identified in Operational Planning Analyses must have an associated Operating Plan, the standards require that IROLs have an Operating Plan/Process/Procedure that contains steps up to and including load shedding to prevent exceeding the IROL.

3. IROLs should be established such that when an IROL is exceeded, the Interconnection has entered into an N-1 or credible N-2 insecure state, i.e., the most limiting single P1 Contingency or credible MC could result in instability, uncontrolled separation or cascading outages that adversely impact the reliability of the BES.

[4] Reliability Coordination, System Operating Limits Methodology for the Operations Horizon, Rev. 8.1, effective April 1, 2017 p.50

An IROL is defined in the NERC Glossary of Terms as:
A System Operating Limit that, if violated, could lead to instability, uncontrolled separation, or Cascading outages that adversely impact the reliability of the Bulk Electric System.

As studies are performed and contingencies are analyzed, AEPCO shall identify any SOLs that may qualify as IROLs, according to the above definitions. A goal of the long-term planning process is to assure that any IROLs are identified and not exceeded in pre-Contingency and post-Contingency conditions.

The following sections describe the AEPCO internal planning criteria to aid in the establishment of SOLs in the operating and planning timeframes. Operating system studies and planning system studies can be considered adequate if they follow the criteria listed, but in all cases, it is required that sound engineering and operating judgment be the final rule.

3.1 Normal Operating Conditions (pre-Contingency):

a. Transmission lines should not be loaded greater than 100% of the thermal rating of the conductors.
b. Transformers, circuit breakers, current transformers, and other equipment should not be loaded above their continuous nameplate rating.
c. Transmission system voltages should not fall below 0.95 p.u. of nominal nor rise above 1.05 p.u. of nominal.
d. For long-range planning system studies, an appropriate power factor for the planning period will be used.
e. For operating system studies, an appropriate power factor for the operation-planning period will be used.

An exception may arise in which normal operating limits may vary from those above. AEPCO will adhere to the system operating limits set forth by the Transmission Planner who has jurisdiction over the applicable facilities.

3.2 Emergency Operating Conditions (post-Contingency):

a. Transmission lines should not be loaded greater than the specified emergency ratings.
b. Transformers should not be loaded greater than the specified emergency rating of the transformers.
c. Circuit breakers, current transformers, and other equipment should not be loaded above their continuous nameplate rating, except as permitted under applicable IEEE standards.
d. Transmission system voltages should not fall below 0.90 p.u. of nominal nor rise above 1.10 p.u. of nominal.
e. For long range planning system studies, an appropriate power factor for the planning period will be used.
f. For operating system studies, an appropriate power factor for the operation-

planning period will be used.

An exception may arise in which emergency operating limits may vary from those above. AEPCO will adhere to the system operating limits set forth by the Transmission Planner who has jurisdiction over the applicable facilities.

Transformers in the AEPCO system have a normal and emergency rating which is based on the manufacturer's nameplate data. During All Lines In Service (ALIS) operation the loading of the transformer should not exceed its Normal Rating. During system contingencies, the loading of the transformer should not exceed its Emergency Rating. AEPCO follows the recommendations of NERC Standard PRC-023 which limits the ability of automatic protection equipment to de-energize transformers. This allows time to permit operator intervention and helps avoid potential system cascading. In an emergency event, the transformer emergency rating may be exceeded, thus allowing for operator intervention within 30 minutes. Under special circumstances, AEPCO may wish to evaluate other sources in regard to manufacturer's specifications, such as the latest applicable versions of IEEE Standard C57.13-2008, IEEE Std. 57.91-1995 or IEEE Std. C57.119-2001.

Ampacities for the bulk of AEPCO's transmission lines have been developed using the calculations based on IEEE Standard 738 in its analysis of determining the current-temperature relationship of its lines. Calculations were made for each conductor that is used on the AEPCO system, and for standard conductor sizes that could be used on the transmission system as needed for future load growth. The calculations for normal operating conditions use the design criteria of 75° C, and the emergency operating conditions use a conductor design temperature rating of 100° C.

All terminal equipment, such as air disconnect switches, power circuit breakers, power circuit switches and current transformers shall be rated according to the manufacturer's nameplate ampacity at the applied nominal voltage. Normal and Emergency Ratings will be identical.

AEPCO compensation devices consist solely of shunt capacitors; there are no series compensation devices on the AEPCO system. Shunt capacitors will be rated according to the manufacturer's nameplate ampacity at the applied nominal voltage. Normal and Emergency Ratings will be identical.

4 Facility Rating Methodologies (SOL Derivation)[5]

4.1 Facility limits:

All facility Rating shall respect the most limiting applicable Equipment Rating of the individual equipment that comprises that Facility.

[5] FAC-008-3 R3, R3.1, R3.2, R3.2.1, R3.2.2, R3.2.3, R3.2.4
[5] FAC-008-3 R1, R2, R4 R1.1, R2.1, R2.2, R2.4.1, R2.4.2, R2.3

4.2 Generation Facilities[6]

AEPCO has five solely owned BES generating facilities, one black-start unit, and no jointly owned generator facilities. Each generator is located at Apache Station and each unit Facility Rating is limited by the generator itself, and not by the associated step-up transformer and associated equipment. The associated equipment and step up transformers all have ratings exceeding the generator rating, as provided in the Appendices. These BES units are named ST1, ST2, ST3, GT3, and GT4. GT1 is AEPCOs black-start unit and also a combined cycle unit with ST1.

AEPCO's Equipment Ratings are expressed in megawatts based on the equipment's associated generator nameplate kilovolt-amperes and power factor. For equipment located on the secondary side of current transformer circuits, the Equipment Rating will be based on the primary side current, associated generator nameplate kV, and generator nameplate power factor.

The Normal Rating of any one generator is based on the generator manufacturer's nameplate rating and is equal to the maximum generator nameplate rating as reported on Form EIA-860, Annual Electric Generator Report, and EIA 767. From EIA 767, "...report the maximum generator nameplate rating in megawatts. If the nameplate rating is expressed in kilovolt-amperes, convert to kilowatts by multiplying the power factor by the kilovolt-amperes, then convert kilowatts to megawatts by dividing by 1,000. If more than one rating appears on the nameplate, select the highest rating. Do not indicate the nameplate rating of the turbine."

The Emergency Rating of each of AEPCO's generating facilities is equal to the Facility's Normal Rating.

4.2.1 Table 1: Generator Facility Rating Summary[6]

Facility	Owner's Normal Rating (MW)	Owner's Emergency Rating (MW)	Most Limiting Element
ST1	81.6	81.6	Generator @ p.f.=0.85
ST2	204.0	204.0	Generator @ p.f.=0.85
ST3	204.0	204.0	Generator @ p.f.=0.85
GT1	11.5	11.5	Generator @ p.f.=0.85
GT3	78.8	78.8	Generator @ p.f.=0.9
GT4	60.5	60.5	Generator @ p.f.=0.85

Generator ratings are determined in accordance with EIA methods based on nameplate MVA and power factor. These ratings are only indicative of the generator and equipment manufacturer's stated electrical capability. They do not reflect the megawatt producing capability of the plant. These limits do however include the assessment of other equipment localized to each generating unit; and the most limiting Rating is the thermal limitations of each respective generator and associated equipment.

[6] FAC-008-3 R1

4.3 Overhead Conductors

The calculations for normal operating conditions use the design criteria of 75° C, and the emergency operating conditions use a conductor design temperature rating of 100° C. AEPCO incorporates the calculations used in the IEEE Standard 738, IEEE Standard for Calculating the Current-Temperature of Bare Overhead Conductors, in its analysis of determining the current-temperature relationship of its conductors, given the parameters noted in Table 2.

The ratings can be found in Table 2 below. The conductor ratings apply to the entire line, including the last span of the line entering a substation. The limiting factors of each transmission line are discussed in the next Section and a spreadsheet of AEPCO's transmission line ratings can be found in Appendix A, AEPCO Transmission Line Ratings.

The updated conductor ratings have also been done to calculate year-round 15-minute, 30-minute and 4-hour emergency ratings, using an Excel-based program to produce a loading guide for each conductor, based on the IEEE Standard 738. The same parameters noted in Table 2 below were used to calculate these emergency ratings.

The 15-minute and 30-minute emergency ratings will be utilized by System Operations in their Dispatch Center where contingency overloads can be mitigated within 15 to 30 minutes.

The values for the 4-hour emergency ratings (often referred as just the Emergency rating) for all conductors below are based on 130% of the normal ratings. The uniform increase of 30% in Emergency rating over normal rating was chosen conservatively as the lowest ratio obtained in normal and emergency rating calculations for different types of conductors. It should be noted that the 15-minute and 30-minute emergency ratings for the smaller conductors, #2 CU to 636 ACSR, are the same as the 4-hour emergency rating. For conductor sizes 795 AAC and up, three emergency rating values may be applicable including 15-minute, 30-minute and 4-hour ratings. The 15-minute ratings are 140% of normal and the 30-minute ratings are 135% of normal.

4.3.1 Table 2: Conductor Thermal Ratings

At 75° C Operating Temperature			
Based on 4 ft. per second Wind Velocity			
and 40° C Air Temperature			
15-Minute, 30-Minute and 4-Hour Ratings are same for smaller conductors to 636 ACSR			
15-Minute, 30-Minute and 4-Hour Ratings listed below for conductors 795 AAC & Up			
ACSR/AAC Conductor		Copper Conductor	
SIZE	AMPS (Normal/Emergency)	SIZE	AMPS (Normal/Emergency)
1/0 – 105.7 ACSR	239/311	#2 – 3 Strand	235/306
2/0 – 133.0 ACSR	274/356	#2 – 7 Strand	228/296
3/0 – 167.7 ACSR	314/408	4/0 – 211.6 MCM	476/619
4/0 – 211.6 ACSR	361/469	350 MCM	653/849
266.8 ACSR	451/586		
336.4 ACSR	522/679		
397.5 ACSR	580/754		
477 AAC	631/820		
477.0 ACSR	652/848		
556.0 ACSR	718/933		
636.0 ACSR	781/1015		
795.0 AAC	870/1218/1175/1131		
795.0 ACSR	899/1259/1214/1169		
954.0 AAC	974/1364/1315/1266		
954.0 ACSR	989/1385/1335/1286		
2 – 954 ACSR	1978/2769/2670/2571		
1033.5 ACSR	1040/1456/1404/1352		
1192.5 ACSR	1135/1589/1532/1476		
1272.0 AAC	1164/1630/1571/1513		
1272.0 ACSR	1182/1655/1596/1537		
1351.5 ACSR	1228/1719/1658/1596		
1590.0 ACSR	1359/1903/1835/1767		
2167.0 ACSR	1624/2274/2192/2111		

The parameters upon which the conductor ratings are based are found in Table 3 below:

4.3.2 Table 3: Conductor Rating Modeling Parameters

Parameters Common to All Locations/Conductors		
Parameter	Continuous Rating	Emergency Rating
Wind Direction	70° to Line	70° to Line
Emissivity	0.7	0.7
Absorptivity	0.8	0.8
Date	July 1	July 1
Time	4 PM	4 PM

Latitude	32.5° North	32.5° North
Elevation	2500 Ft	2500 Ft
Solar Input	Clear	Clear
Allowable Cond. Temp (ACSR)	75° C	100° C or sag limit
Wind Speed	4 ft/s	4 ft/s
Ambient Temperature	40° C	40° C

The following items are pertinent with regard to the current conductor rating method:

a. The thermal ratings from Table 2, used by AEPCO to rate its transmission lines, are considered to be conservative. The emergency ratings are set at 130% of the normal rating based on ratings developed for each transmission line according to IEEE Standard 738. If through internal studies it is determined that a line will become stability limited, (at a value lower than the thermal limit) its rating will be based on its particular stability limit.
b. The weather parameters for development of the existing conductor thermal ratings are based on the values for wind direction, absorptivity, and wind speed as noted in Table 3. The conductor ratings are based on a 75° C operating temperature with a 4 feet per second wind speed and a 40° C air temperature. Emergency ratings, as shown in Appendix A, are based on a 100° C operating temperature with a 4 feet per second wind speed and a 40° C air temperature.
c. Rigid Bus and Strain Bus design are determined by the Rural Utilities Service (RUS) Design Guide for Rural Substations Bulletin 1724E-300 (Bulletin) and National Electric Safety Code (NESC) as a minimum. For new 115 kV substations, AEPCO uses a standard schedule 40 aluminum pipe conductor size of 3-inch and for new 230 kV substations, AEPCO uses an aluminum pipe conductor size of 4-inch. There is currently no case on the AEPCO system where the rigid bus or strain bus is a limiting factor for any of AEPCO's transmission line ratings. The ratings of the Aluminum rigid bus or pipe conductor are based on IEEE Standard 605-1998 IEEE Guide for Design of Substation Rigid-Bus Structures, using an emissivity of 0.5, with Sun, at a 40° C temperature rise above 40° C Ambient for normal operating conditions, and a 60° C temperature rise above 40° C Ambient for emergency operating conditions.

4.4 Transmission Line Ratings

Appendix A contains a summary table for the transmission line ratings that take into account the most limiting applicable equipment rating. The Summary table include the most limiting and second most limiting elements. The Summary table is followed by tables that show the individual rating of components that make up each transmission line. Currently, there are not operating limitations in effect as of the date of this revision. Any such limitations will be posted on the AEPCO OASIS. Specific items that are marked "N/A" mean that the facility in question is a legacy facility for which no specific data exists or the facility belongs to another entity that has not provided the requested information.

The summary table allows for the finding of the most limiting factor of a transmission line, as well as the next most limiting factor.

AEPCO ensures that its transmission line ratings are aligned with current design tolerances based on NESC and likewise ensures that actual field conditions do not create a situation that may cause the facilities to be non-compliant with the NESC clearance requirements.

Based on historical, conservative design practices, AEPCO has incorporated additional design margins to compensate for minor variations between design conditions and actual field conditions. In addition, AEPCO verifies its "as-built" conditions by scheduled field visits. Each line segment part of the BES is monitored on an annual basis. AEPCO's current maintenance practices include an annual inspection on concrete and steel structures and a semi-annual inspection on wood structures. Inspections are performed by a journeyman hot stick lineman inspector who has been trained and provided the information to identify problems of a structural nature as well as phase-to-ground clearance issues. The inspector will note changes in field conditions, such as new structures, tree growth, etc. In addition, the inspector has been trained in the use of measuring devices to determine pole integrity and phase-to-ground clearances. The inspection is a visual inspection designed to monitor the integrity, reliability, and compliance with NESC standards checking minimum conductor sag distances at key points throughout the system. Findings are documented, reported, and addressed as issues arise. In addition to on-ground line inspections, AEPCO also performs regular aerial bucket or climbing inspections in high-risk areas outlined in AEPCO's Transmission Vegetation Management Plan (TVMP).

4.5 Transformers

AEPCO owns the following types of power transformers:

a. Load serving transformers with LTC
   -Conventional
   -Auto
b. Tie Autotransformers

The Normal and Emergency Ratings for terminal equipment are determined as follows:

4.5.1 Table 4: Transformer Ratings

Equipment	Normal Rating	Emergency Rating ½ Hour Maximum Overload
AEPCO Transformers	100% Manufacturer's highest Nameplate Rating @ 55° C or 65° C rise	125% of Manufacturer's Nameplate Rating @ 55° C or 65° C rise

During All Lines In Service (ALIS) operation, the loading of the transformer should not exceed the normal rating. During system contingencies, the loading of the transformer should not exceed its Emergency Rating, which is set at 125% of the normal rating based on ratings developed for each transformer according to IEEE Std. C57.91-1995, Guide for Loading Mineral-Oil-Immersed Transformers. AEPCO can exceed its normal ratings for

up to 30 minutes. In addition, AEPCO follows applicable Transmission Relay Loadability criteria listed within NERC Reliability Standard PRC-023-4 which limits the ability of automatic protection equipment to de-energize transformers. This allows time to permit operator intervention and helps avoid potential system cascading. Under special circumstances, AEPCO may wish to evaluate other sources in regard to manufacturer's specifications, such as the latest applicable versions of IEEE Standard C57.15.12.00-2010, IEEE Standard for General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers, and IEEE Std. C57.119-2001, IEEE Recommended Practice for Performing Temperature Rise Tests on Oil-Immersed Power Transformers at Loads Beyond Nameplate Ratings. Appendix B contains a summary table of AEPCO transformer data including the ratings as discussed in this Section.

Some transformers on the AEPCO system are owned by other entities or co-owned by AEPCO and other entities. Appendix B lists these specific transformers and notes the operating agent responsible for the transformer ratings. For all jointly owned Facilities, AEPCO will follow the operating agent's methodology, unless otherwise agreed.

4.6 Relays

No AEPCO BES Facilities have ratings that are limited by protection or monitoring devices. AEPCO's relays will not trip (trip on Zone 3/Zone 4) due to normal or emergency load current (see NERC Reliability Standard PRC-023-4). New facilities and protection schemes are reviewed by AEPCO to ensure that loadability requirements are met.

4.7 Terminal Equipment (Breakers, Switches, etc.)

Power Circuit Breakers will be rated according to the manufacturer's nameplate ampacity at the nominal applied voltage. Normal and Emergency Ratings will be identical. This is in accordance with IEEE C37.010-1999 (R2005), IEEE Application Guide for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis, and IEEE C37.06, IEEE Standard for Switchgear – AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis – Preferred Ratings and Related Required Capabilities.

Power Circuit Switchers will be rated according to the manufacturer's nameplate ampacity at the nominal applied voltage. Normal and Emergency Ratings will be identical.

Air Disconnect Switches will be rated according to the manufacturer's nameplate ampacity at the nominal applied voltage. Normal and Emergency Ratings will be identical. This is in accordance with IEEE C37.30, IEEE Standard Requirements for High-Voltage Switches, and IEEE C37.37a-1996, IEEE Standard Loading Guide for AC High-Voltage Air Switches Under Emergency Conditions.

Current Transformers as installed on the AEPCO system are primarily Bushing Current Transformers that are supplied with power transformers and circuit breakers. These will be rated according to the corresponding unit's nameplate in accordance with IEEE C57.13-2008, IEEE Standard Requirements for Instrument Transformers. A thermal rating factor will be applied to the normal and emergency ratings as provided by the manufacturer or developed based on industry practice. Normal and Emergency Ratings will be identical. Under certain circumstances, AEPCO may wish

to evaluate other sources in regard to manufacturer specifications, such as increasing a thermal rating factor for a legacy bushing current transformer.

For the purposes of AEPCO's line limits evaluation, CT settings are not considered. The nominal nameplate primary ratings all exceed the current line limits. According to IEEE C37.110, for C class CTs, the secondary voltage that the CT will deliver when it is connected to a standard secondary burden, at 20 times the rated secondary current, without exceeding a 10% ratio error. This margin gives the necessary accuracy to allow all protective devices to function appropriately on AEPCO's system without going into significant saturation.

There are very few freestanding current transformers on the AEPCO system, but they are also rated according to the corresponding unit's nameplate in according with IEEE C57.13-2008.

The Normal and Emergency Ratings for terminal equipment are determined as follows:

4.7.1 Table 5: Terminal Equipment Ratings (Breakers, Switches, etc.)

Equipment	Normal Rating	Emergency Rating
Power Circuit breakers	100% of Manufacturer's Nameplate Rating	100% of Manufacturer's Nameplate Rating
Power Circuit switchers	100% of Manufacturer's Nameplate Rating	100% of Manufacturer's Nameplate Rating
Air Disconnect switches	100% of Manufacturer's Nameplate Rating	100% of Manufacturer's Nameplate Rating
Current transformers	100% of Manufacturer's Nameplate Rating	100% of Manufacturer's Nameplate Rating

Additional applicable IEEE standards will be consulted as deemed necessary regarding the rating of its terminal equipment. Appendix C, AEPCO Power Circuit Breaker & Circuit Switcher Ratings, and Appendix D, Substation Switch Ratings, contain the summary tables for AEPCO terminal equipment ratings.

4.8 Compensation Devices

a. Shunt compensations
Shunt capacitors will be rated according to the manufacturer's nameplate ampacity and in accordance with IEEE 18-2012, IEEE Standard for Shunt Power Capacitors. Appendix E, Shunt Capacitor Ratings, contains a summary table for AEPCO shunt capacitor ratings. The normal and emergency ratings for shunt compensation devices will be identical as follows:

Equipment	Normal Rating	Emergency Rating
Shunt Capacitors	100% of Manufacturer's Nameplate Rating	100% of Manufacturer's Nameplate Rating

b. Series compensation
AEPCO has no series compensation devices on its system.

5 Establishment and Communication of Facility Ratings

AEPCO establishes BES Facility ratings in accordance with this document. AEPCO submits its most up-to-date ratings as part of the WECC base case preparation process on a periodic basis as required by WECC. GE PSLF Powerflow Model, includes tables of the AEPCO power flow modeling data with corresponding normal and emergency equipment ratings.

Within 21 calendar days of receipt of a request for documentation for determining its Facility Ratings and its Facility Ratings methodology for inspection and technical review by the RC, WAPA-DSW and other Transmission Operators and Transmission Planners that work within the same Transmission Planning Area.[7]

Within 45 calendar days of receipt of documented comments on its technical review of the AEPCO's Facility Ratings methodology or documentation for determining its Facility Ratings from the above RC, WAPA-DSW, Transmission Operator and Transmission Planner AEPCO will provide a response to that commenting entity.[8]

Within 30 calendar days (or a later date if specified by a requestor) for any requested Facility with a Thermal Rating that limits the use of Facilities under a requestor's authority by causing any of the following: 1) An Interconnection Reliability Operating Limit, 2) A limitation of Total Transfer Capability, 3) An impediment to generator deliverability, or 4) An impediment to service to a major load center, AEPCO shall identify the existing next most limiting equipment of the Facility and the Thermal Rating for that most limiting equipment.[9]

When AEPCO has determined that updated ratings are applicable, it will communicate those ratings as part of the WECC base case preparation process as appropriate and also communicate those new or modified facilities ratings to its associated Reliability Coordinator(s), Planning Coordinator(s), Transmission Planner(s), Transmission Owner(s) and Transmission Operator(s) as scheduled by such requesting entities as appropriate. AEPCO will keep all superseded portions of its Facility Ratings Methodology, and any modifications to this document that were in force since its last compliance audit. AEPCO will keep all other related documentation determining that its Facility Ratings are consistent with this methodology and associated responses to requested information from applicable entities for the audit period: [10]

a. AEPCO shall establish SOLs as directed by the RC for its portion of the RC Area (excluding MWD BES Facilities) that are consistent with the RC's SOL Methodology for the Operations Horizon.[11]

[7] FAC-008-3 R4
[8] FAC-008-3 R5
[9] FAC-008-3 R1.2, R8.2
[10] FAC-008-3 R6, R7, R8.1
[11] FAC-014-2 R2

b. AEPCO shall establish SOLs for its Transmission Planning Area that are consistent with the Western Area Power Administration (WAPA) SOL Methodology for the Planning Horizon.[12]

c. AEPCO will utilize SOLs established by the CAISO for MWD's BES Facilities in the CAISO Transmission Planning Area that are consistent with the CAISO SOL Methodology for the Operating and Planning Horizon.[13]

d. SOL studies performed shall use WECC-approved base cases reflecting anticipated system conditions.

e. SOLs shall be derived from computer simulations/models, technical limitations, contract rights on jointly owned and third party systems, and Facility Ratings.

f. The facilities addressed in this document include, but are not limited to, transmission conductors, transformers, relay protective devices, terminal equipment, and series and shunt compensation devices.

g. The methodology criteria addressed Normal and Emergency ratings for the facilities that comprise AEPCO's BES.

h. In the pre-Contingency and post-Contingency states (system normal and emergency conditions), the BES must demonstrate transient, dynamic and voltage stability.

AEPCO shall communicate its SOL Methodology, and any changes to the Methodology, to the RC, WAPA-DSW, other TOPs, and Transmission Service Providers that work within its Transmission Planning Area, and share its information with adjacent TPs. The Transmission Operator shall provide any SOLs it developed to its Reliability Coordinator and to the Transmission Service Providers that share its portion of the Reliability Coordinator Area.[14]

For the MWD 230 kV facilities for which AEPCO acts as the TOP, CAISO conducts operational studies in accordance with the applicable NERC/WECC Reliability requirements, CAISO Tariff and Business Practice Manual provisions applicable to the TOP function including the establishment and communication of SOLs.[15] The results of these studies are communicated to AEPCO for inclusion in the Seasonal, Day-Ahead and Current Day operational plans.

CAISO will communicate the SOLs for the MWD BES Facilities to the RC.

[12] FAC-014-2 R4
[13] FAC-014-2 R4
[14] FAC-014-2 R5, R5.2, R5.4
[15] Operating Agreement between The Metropolitan Water District of Southern California and the California Independent System Operator Corporation dated July 3, 2017.

APPENDIX A
Transmission Line Ratings

AEPCO Transmission Line Limits

Sub From	Sub To	Volt	Normal Limit	Emergency Limit	Normal Limit	Emergency Limit	Limit Element	Next Element Norm/Emrg	Next Limit Norm/Emrg
		KV	AMP	AMP	MVA	MVA			AMP
HASSAYAMPA	PINAL WEST	500	3896	4480	3374	3880	Conductor	Cond/Breaker	4551/5000
PINAL WEST	HASSAYAMPA	500	3896	4480	3374	3880	Conductor	Cond/Breaker	4551/5000
GREEN-SW	GREENLEE	345	1978	2000	1182	1195	Conductor	Switch	2000
GREENLEE	GREEN-SW	345	1978	2000	1182	1195	Conductor	Switch	2000
BICKNELL	VAIL	345	1600	1600	956	956	Switch	Conductor	1978/2571
VAIL	BICKNELL	345	1600	1600	956	956	Switch	Conductor	1978/2571
PINAL WEST	VAIL	345	2000	2000	1195	1195	Term. Eq.	Breaker	2380
VAIL	PINAL WEST	345	2000	2000	1195	1195	Term. Eq.	Breaker	2380
PINAL WEST	WESTWING	345	2000	2000	1195	1195	Term. Eq.	Breaker	2000
WESTWING	PINAL WEST	345	2000	2000	1195	1195	Term. Eq.	Breaker	2000
DOSCONDO	HACKBERRY	230	1164	1200	464	478	Conductor	Cond/TermEq	1182/1200
HACKBERRY	MORENCI	230	1164	1513	464	603	Conductor	Conductor	1182/1537
GREEN-SW	MORENCI	230	1182	1537	471	612	Conductor	Switch	1600
MORENCI	PD-MORNC	230	989	1286	394	512	Conductor	Conductor	1182/1537
APACHE	BUTERFLD	230	899	1169	358	466	Conductor	Conductor	989/1286
BUTERFLD	APACHE	230	899	1169	358	466	Conductor	Conductor	989/1286
APACHE	RED TAIL	230	1182	1200	471	478	Conductor	Switch	1200
RED TAIL	APACHE	230	1182	1200	471	478	Conductor	Switch	1200
APACHE	WINCHESTER	230	1182	1537	471	612	Conductor	Switch	1600
WINCHESTER	APACHE	230	1182	1537	471	612	Conductor	Switch	1600
BUTERFLD	PANTANO	230	899	1169	358	466	Conductor	Switch	1200
PANTANO	BUTERFLD	230	899	1169	358	466	Conductor	Switch	1200
BUTERFLD	SAN RAF	230	989	1200	394	478	Conductor	Switch	1200
PANTANO	NEWTUCSN	230	899	1169	358	466	Conductor	Switch	1600
NEWTUCSN	PANTANO	230	899	1169	358	466	Conductor	Switch	1600
NEWTUCSN	SAHUARITA	230	899	1169	358	466	Conductor	Cond/R.Bus	1182/1217
SAHUARITA	NEWTUCSN	230	899	1169	358	466	Conductor	Cond/R.Bus	1182/1217
SAHUARITA	BICKNELL	230	899	1169	358	466	Conductor	R.Bus	1217
BICKNELL	SAHUARITA	230	899	1169	358	466	Conductor	R.Bus	1217
RED TAIL	DOSCONDO	230	1182	1200	471	478	Conductor	Switch	1200
DOSCONDO	RED TAIL	230	1182	1200	471	478	Conductor	Switch	1200
DAVIS	RIVIERA	230	1182	1200	471	478	Conductor	Switch	1200
APACHE	HAYDENAZ	115	631	820	126	163	Conductor	Conductor	652/847
HAYDENAZ	APACHE	115	631	820	126	163	Conductor	Conductor	652/847
MARANA	MARANATP	115	718	800	143	159	Conductor	Switch	800
MARANATP	MARANA	115	718	800	143	159	Conductor	Switch	800
MARANA	AVRA	115	870	1131	173	225	Conductor	Cond/Switch	1182/1200
AVRA	MARANA	115	870	1131	173	225	Conductor	Cond/Switch	1182/1200
AVRA	SANDARIO	115	870	1131	173	225	Conductor	Conductor	899/1169
SANDARIO	AVRA	115	870	1131	173	225	Conductor	Conductor	899/1169
SANDARIO	THREEPNT	115	361	469	72	93	Conductor	Conductor	899/1169
THREEPNT	SANDARIO	115	361	469	72	93	Conductor	Conductor	899/1169
BICKNELL	THREEPNT	115	652	848	130	169	Conductor	Conductor	899/1169
THREEPNT	BICKNELL	115	652	848	130	169	Conductor	Conductor	899/1169
THREEPNT	VALENCIA	115	652	848	130	169	Conductor	Conductor	899/1169
PANTANO	KARTCHNR	115	652	848	130	169	Conductor	Conductor	899/1169
VALENCIA	CAWCD	115	1200	1200	239	239	Switch	R.Bus	1623

1) SRP is the operating agent for the Hassayampa to Pinal West 500 kV line and has determined its line ratings. SWTC owns 7.305% of this line.
2) TEP is the operating agent for Pinal West to Vail and Pinal West to Westwing 345 kV lines and have determined their line ratings. SWTC owns 24% of these lines.
3) Dos Condados to Hackberry to Morenci 230 kV Lines limited by 1272 AAC conductor.
4) Davis to Riviera 230 kV line limited by 1272 ACSR Conductor Normal Conditions and limited by 1200A disconnect switch Emergency Conditions.
5) Apache to Hayden 115 kV Line limited by 477 AAC conductor at Apache (SWTC Rating) and Hayden (SRP Rating).
6) Marana to Avra and Avra to Sandario 115 kV Lines limited by 795 AAC conductor at Avra.
7) AEPCO is the TO for the Valencia to Spreader Tie line with 50% ownership with CAP and 65% capacity. Conductor is 954 ACSS.
8) CTs are not considered as limiting elements since they will continue to operate with over 90% ratio accuracy up to 20 times rated secondary current.

EXHIBIT AEPCO-6

TEP TEN-YEAR PLAN FOR 2022 (JAN. 31, 2022)

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibit.

ORIGINAL

E000017669

Tucson Electric Power

88 East Broadway Blvd. | Post Office Box 711 | HQE910 | Tucson, AZ 85702-1702

January 31, 2022

Docket Control
Arizona Corporation Commission
1200 West Washington Street
Phoenix, AZ 85007

Re: Notice of Filing -Tucson Electric Power Company's Ten-Year Plan
Transmission Projects 2022-2031
Docket No. E-99999A-21-0009

Pursuant to A.R.S § 40-360.02, attached is Tucson Electric Power Company's ("TEP") Ten-Year Plan Transmission Projects for years 2022-2031. As required by Decision No. 74785 (October 24, 2014), this plan includes a study report on the effects of distributed generation and energy efficiency on TEP's future transmission needs.

If you have any questions, please contact me at (520) 918-8359.

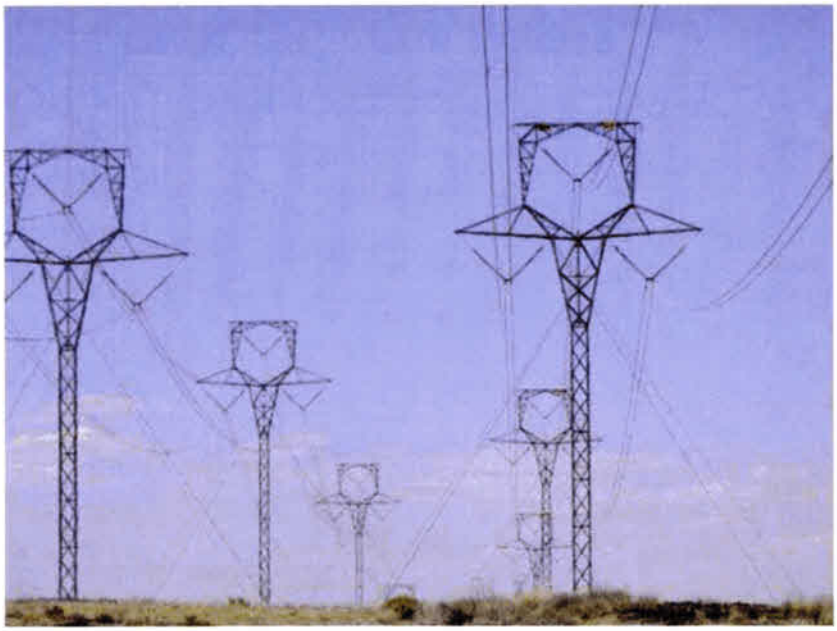
Sincerely,

/s/Andrea Jacobo

Andrea Jacobo
Regulatory Services Coordinator

cc: Compliance Section, ACC

ACC - Docket Control - Received 1/31/2022 1:19 PM
ACC - Docket Control - Docketed 1/31/2022 1:29 PM



Tucson Electric Power

TEN-YEAR PLAN

TRANSMISSION PROJECTS FOR YEARS 2022-2031

JANUARY 31, 2022

DOCKET NO:

E-99999A-21-0009

Tucson Electric Power

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TUCSON ELECTRIC POWER COMPANY
TEN-YEAR PLAN
TRANSMISSION PROJECTS
2021-2030

Introduction

General Overview

Pursuant to the Arizona Revised Statutes ("A.R.S.") § 40-360.02 (A), Tucson Electric Power Company ("TEP") hereby submits its' 2022-2031 Ten-Year Plan ("TYP") to the Arizona Corporation Commission ("Commission"). As noted in A.R.S § 40-360.02 (F) the plans contained in this report should be considered as tentative information only and are subject to change at any time at the discretion of TEP. Changes of any significance that occur prior to the next TYP filing, will be discussed with Commission Staff.

The TYP was prepared consistent with in-service dates for new distribution substations as determined by TEP's distribution planning process. The study for development of the TYP was conducted in 2021 and the results of the study are represented in the TYP. Estimated in-service dates may vary depending upon changes in regulatory requirements, underlying assumptions, other utilities' plans and economic conditions.

Load Forecasting

The TYP was developed based on a forecast that takes into account energy efficiency ("EE") programs, Distributed Generation ("DG"), and TEP's retail customer load.

Project Status Definitions

Planned Projects

The TYP includes planned projects for TEP's 500-kV, 345-kV, 230-kV, and 138-kV transmission facilities. Previously reported planned projects that have been canceled are not included.

Conceptual Projects

For informational purposes, TEP has also included conceptual projects for its transmission system. Because these conceptual projects are not expected to be built within the ten-year planning horizon, their in-service date is shown as "to be determined" ("TBD"). These conceptual projects will become planned projects as they move into the ten-year planning horizon in subsequent studies.

Completed Projects:

Projects submitted in previous TYPs that have been completed are designated as such in the TYP for tracking purposes. See **Table 1** for a summary of completed projects. These projects will be removed from future TYPs.

Table 1: Completed Projects

Project	In-Service Date
Hassayampa – Pinal West 500-kV Line Loop-in to Jojoba Switchyard	12/18/2021

Biennial Transmission Assessment Orders ("BTA")

In this section, TEP highlights additional requirements that have been ordered per previous Biennial Transmission Assessments ("BTA"). Only BTA orders with requirements that need to be addressed are referenced in this section.

BTA orders are typically published in even numbered years while any new studies that result from BTA orders are performed in subsequent years and filed as part of that year's Ten Year Plan filing. Technical studies that were ordered in previous BTAs are: 1) Reliability Must Run ("RMR"); 2) Extreme Contingency Analysis; 3) Tenth Year Snapshot Study; 4) and impacts of Distributed Generation ("DG") and Energy Efficiency ("EE") programs on planned projects. Each of these studies is addressed within this TYP.

The Commission's first biennial assessment of Arizona's existing and planned transmission system, BTA, Decision No. 63876 (July 25, 2001), required utilities to provide internal planning criteria and system ratings with limiting elements identified in their TYPs. TEP will provide such information to Staff upon request. TEP's transmission system is planned to meet the North American Electric Reliability Corporation ("NERC") Transmission Planning Standards and Western Electricity Coordinating Council ("WECC") planning criteria effective at the time the study was conducted. TEP's internal planning criteria is consistent with these standards.

In the Third BTA, Decision No. 67457 (January 4, 2005), the Commission ordered that each entity conduct RMR, Extreme Contingency Analysis, and Tenth Year Snapshot studies. The Extreme Contingency Analysis is filed separately under a confidentiality agreement for each year

the BTA studies are performed. The Tenth Year Snapshot is a joint effort conducted under Southwest Area Transmission ("SWAT").

In the Fifth BTA, Decision No. 70635 (December 11, 2008), the commission ordered utilities and load serving entities to provide their top three Renewable Transmission Projects (RTP) and to continue to monitor the reliability in Cochise County and propose modifications that they deem to be appropriate in future Ten-Year Plans. TEP's top three RTPs were provided as part of the Sixth BTA, Decision No. 72031 (December 10, 2010). TEP continues to monitor reliability in Cochise County, and will propose modifications deemed appropriate in future Ten-Year Plans.

Consistent with the Sixth BTA, Decision No. 72031 (December 10, 2010), the Commission ordered that the TYP contain planned transmission re-conductor projects, substation transformer replacements, reactive compensation projects, and an evaluation of DG and EE programs that will affect TEP's retail customer load and future transmission needs. TEP's evaluation of the effects of DG and EE are consistent with the requirements as set forth in the Eighth BTA Decision No. 74785 (October 24. 2014).

In the Seventh BTA, Decision No. 73625 (December 12, 2012), the Commission ordered suspension of the requirement for RMR studies and implemented criteria for re-starting RMR studies based on a biennial review of the factors set forth in the Commission's Seventh BTA Decision. Criteria that would trigger re-starting the RMR studies include:

- An increase of more than 2.5% in the load forecast since the previous BTA (e.g., relative to the final RMR study year for which the RMR studies were last filed, which was 2880MW for TEP load pocket per Seventh BTA, table 11, page 51).
- Planned retirement (or an unexpected long-term outage during the summer months of June, July or August) of a transmission or substation facility required to serve an

RMR load pocket, unless a facility being retired will be replaced with a comparable facility before the next summer season.

- Planned retirement (or an unexpected long-term outage during the summer months of June, July or August) of a generating unit in an RMR load pocket that has been utilized in the past for RMR purposes, unless a generator being retired will be replaced with a comparable unit before the next summer season.
- A significant customer outage in an RMR load pocket during summer months.

Upon review of these factors, TEP is not required to conduct RMR studies for the Tucson RMR load pocket.

In the Eighth BTA, Decision No. 74875 (October 24, 2014), the Commission ordered utilities with retail load to file a study with the Commission as part of the Ninth BTA docket identifying the effects of DG and EE installation and/or programs on future transmission needs. This report is included as Attachment A.

In the Eighth BTA, the Commission also ordered the continued requirement for Arizona utilities to report relevant findings in future BTAs regarding compliance with transmission planning standards from NERC/WECC reliability audits that have been finalized and filed with FERC. TEP underwent its most recent NERC/WECC audit in October 2020. There were no relevant findings from the audit conducted in 2020.

In the Ninth BTA, Decision No. 75817 (November 21, 2016), the commission ordered utilities to report findings from the WestConnect Regional Planning Process Clean Power Plan Utility Plan Scenario Study on behalf of the utilities. This was deemed to be complete in the Tenth BTA, Decision No. 76975 (November 27, 2018).

In the Eleventh BTA Decision No. 77999 (May 5, 2021), the Commission confirmed the continued suspension of the requirement to perform RMR studies in every BTA.

Transmission Planning Process

TEP is a member of the WestConnect Planning Area[1] and SWAT[2]. TEP actively participates in various WestConnect committees and SWAT workgroups to ensure that its transmission system is properly studied and accurately modeled in regional or sub-regional evaluations.

TEP conducts an annual review of its transmission system performance over a ten-year planning period. This review identified upgrades to existing facilities, as well as the need for new facilities, to meet system performance requirements between 2022 and 2031. Capital improvements are proposed for the TEP transmission system to accommodate the addition of new 138/13.8 kV substations, to address increased transmission facility loading, and mitigate localized stability issues. Consistent with the Sixth BTA, TEP also identifies, via its annual studies, needed reactive power projects that will provide voltage support across the TEP transmission system. In-service dates are set to ensure adequate transmission capacity within TEP's service territory.

TEP's transmission system is planned to meet the NERC Transmission Planning Standards and WECC planning criteria effective at the time the study was conducted. TEP's internal planning criteria is consistent with these standards. For this TYP, TEP conducted both power flow and dynamic analysis. The power flow analysis was used to identify thermal overloads under normal and contingency conditions. Dynamic analysis was performed to determine if any transient stability issues exist on the system or are introduced with the inclusion of new projects. Proposed projects were determined such that the performance measures of the NERC Transmission Planning Standards and WECC planning criteria effective at the time the study was conducted are met.

Transmission Projects

[1] See http://regplanning.westconnect.com
[2] See http://regplanning.westconnect.com/swat.htm

TEP's transmission system consists of 500-kV, 345-kV, and 138-kV facilities and has 230-kV facilities planned. For reporting purposes, TEP has separated the planned projects by voltage class (EHV and HV) and categories based on status and type of project. All projects identified in this TYP are needed to serve new facilities or to alleviate thermal or voltage issues. No projects were needed as a result of a transient stability issue as no transient stability issues were identified within the studies.

See **Table 2** for a description of categories for the EHV projects. See ***Figures 1, 2*** and ***3*** for maps depicting approximate routing and project locations for the EHV projects.

Table 2: EHV Project Categories[3]

Projects	Description
Completed EHV Transmission	EHV transmission projects which went into service between February 1, 2021 and January 31, 2022.
Completed Reactive EHV	Reactive projects connected to EHV transmission facilities which went into service between February 1, 2021 and January 31, 2022.
Planned EHV Transmission	EHV transmission projects with projected in-service dates between 2022 and 2031.
Planned Reactive EHV	Reactive projects connected to EHV facilities with projected in-service dates between 2022 and 2031.
Conceptual EHV Transmission	EHV transmission projects where either of the following apply: • Certificate of Environmental Compatibility ("CEC") in place; or • Included in previous ten-year plans but are not scheduled to be in-service between 2022 and 2031.
Conceptual Reactive EHV	Reactive projects connected to EHV facilities included in previous ten-year plans but are not scheduled to be in-service between 2022 and 2031.

[3] All EHV project categories were evaluated in this Ten Year Plan. If the specific category is missing within the detailed project listings, it is assumed that category does not have any projects of this type.

See **Table 3** for a description of categories for HV projects. See ***Figure 4*** for a map depicting approximate routing and locations for the HV projects.

Table 3: HV Project Categories[4]

Projects	Description
Completed HV Transmission	HV transmission projects which went into service between February 1, 2021 and January 31, 2022.
Completed Reactive HV	Reactive projects connected to HV transmission facilities which went into service between February 1, 2021 and January 31, 2022.
Planned HV Transmission	HV transmission projects with projected in-service dates between 2022 and 2031.
Planned Reactive HV	Reactive projects connected to HV facilities with projected in-service dates between 2022 and 2031.
Conceptual HV Transmission	HV transmission projects where either of the following apply: • CEC in place; or • Included in previous ten-year plans but are not scheduled to be in-service between 2022 and 2031.
Conceptual Reactive HV	Reactive projects connected to HV facilities included in previous ten-year plans but are not scheduled to be in-service between 2022 and 2031.

[4] All HV project categories were evaluated in this Ten Year Plan. If the specific category is missing within the detailed project listings, it is assumed that category does not have any projects of this type.

See **Table 4** for a description of categories for generation projects. See **Figures 1, 2, 3, and 4** for maps depicting approximate locations for the generation projects.

Table 4: Generation Project Categories[5]

Projects	Description
Completed Generation	Generation projects connected to TEP's transmission facilities which went into service between February 1, 2021 and January 31, 2022.
Planned Generation	Generation projects connected to TEP's transmission facilities with projected in-service dates between 2022 and 2031.
Conceptual Generation	Generation projects connected to TEP's transmission facilities where either of the following apply: • Certificate of Environmental Compatibility ("CEC") in place; or • Included in previous ten-year plans but are not scheduled to be in-service between 2022 and 2031.

Projects

The TYP includes individual project description sheets for planned and conceptual transmission projects, generation projects, and reactive compensation projects. These project description sheets contain the required information as outlined in ARS § 40-360.02 (C). In addition, projects that were placed in-service since the last TYP filing are included to show completion and will be removed from future filings.

[5] All generation project categories were evaluated in this Ten Year Plan. If the specific category is missing within the detailed project listings, it is assumed that category does not have any projects of this type.

Transmission System Maps

The TYP includes system maps depicting its existing transmission network along with the addition of planned and conceptual projects. The maps and related descriptions are intended to be general planning-level documents to describe projects conceptually. The maps and descriptions are not intended to represent specific routes or geographic project locations.

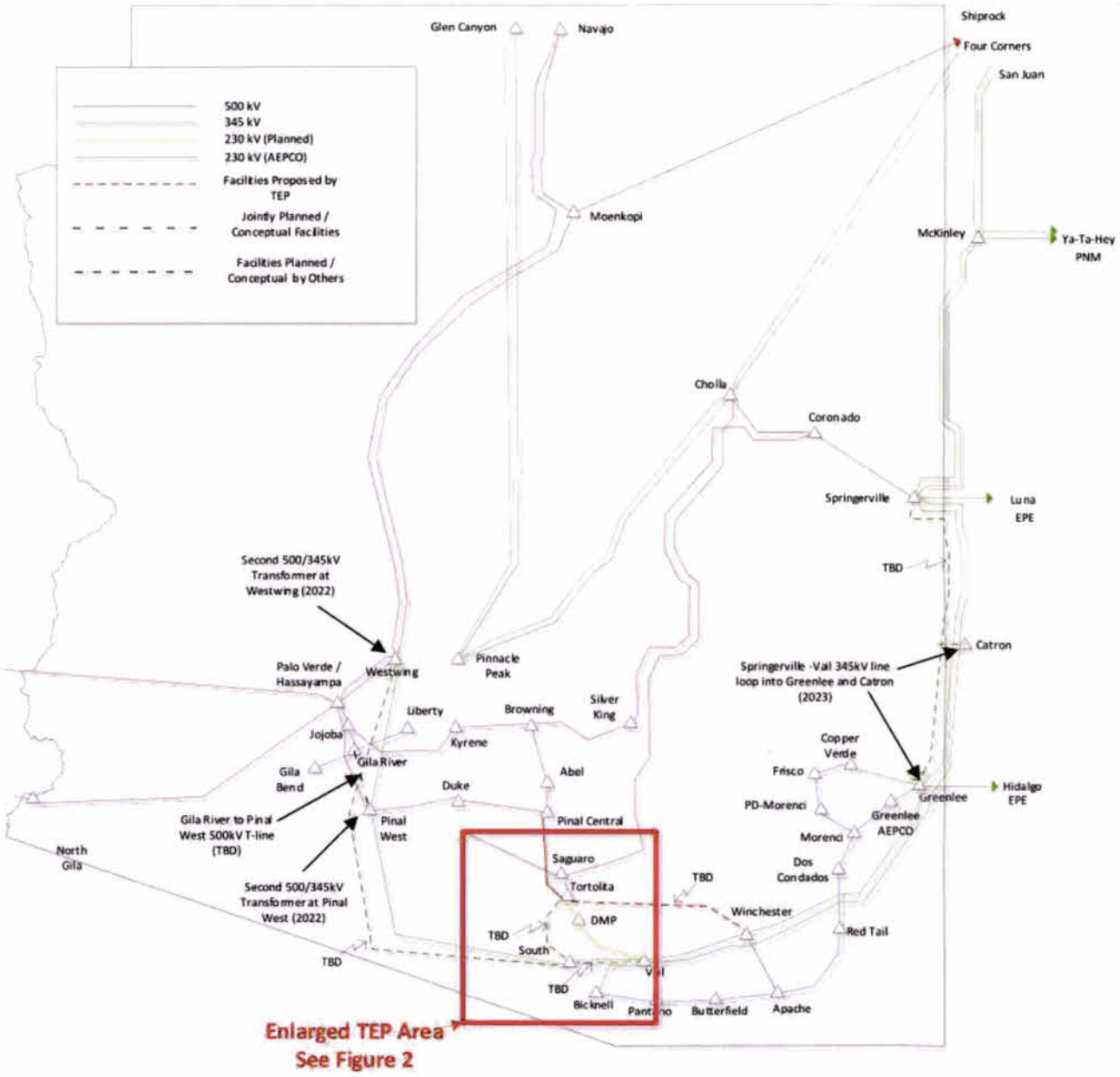

Figure 1: Existing and Planned / Conceptual 230kV, 345kV, and 500kV and neighboring Arizona Electric Power Cooperative (AEPCO) 230kV Transmission Facilities Map

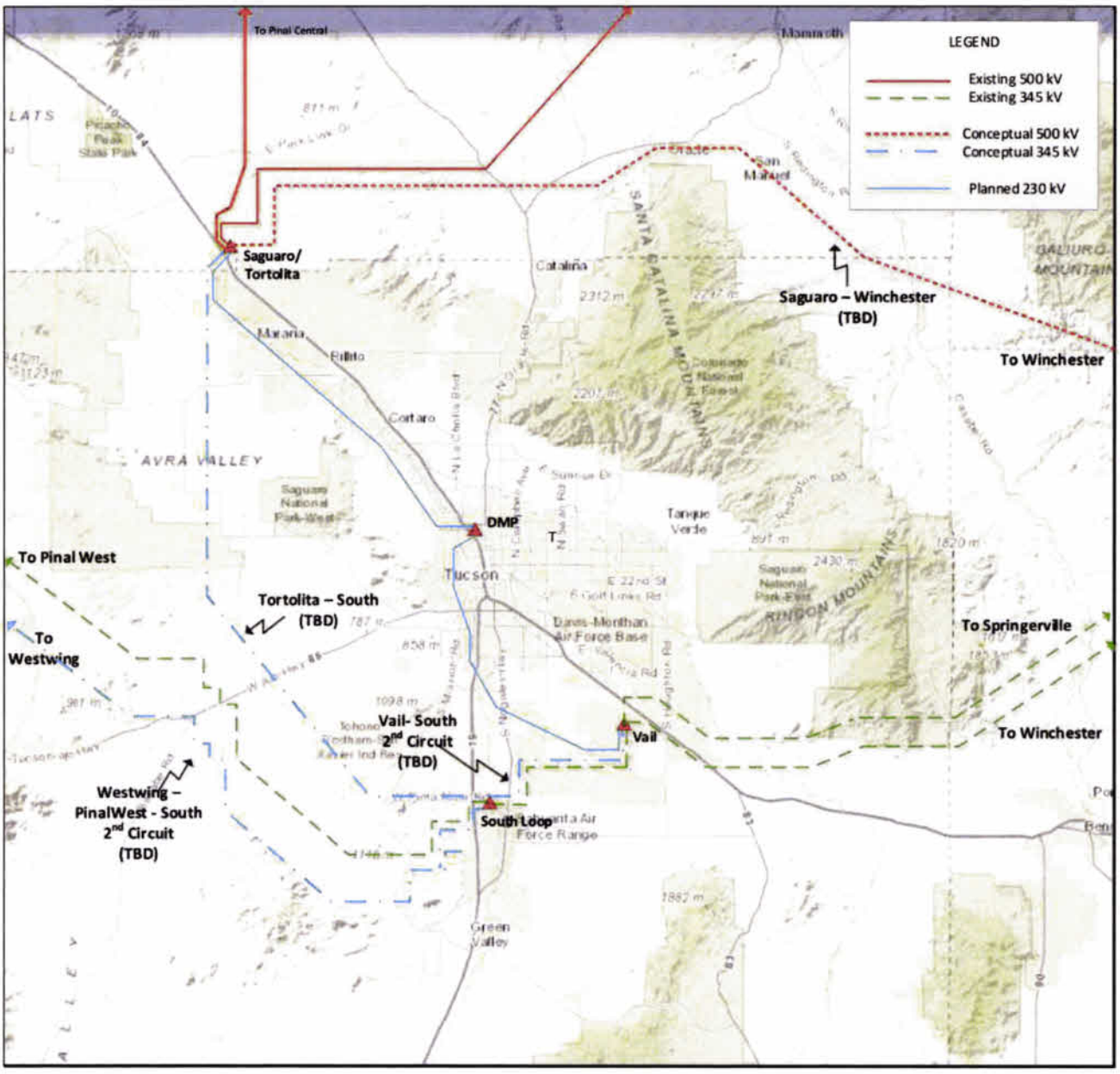

Figure 2: Local Existing and Planned/Conceptual 230kV, 345kV, and 500kV Transmission Facilities

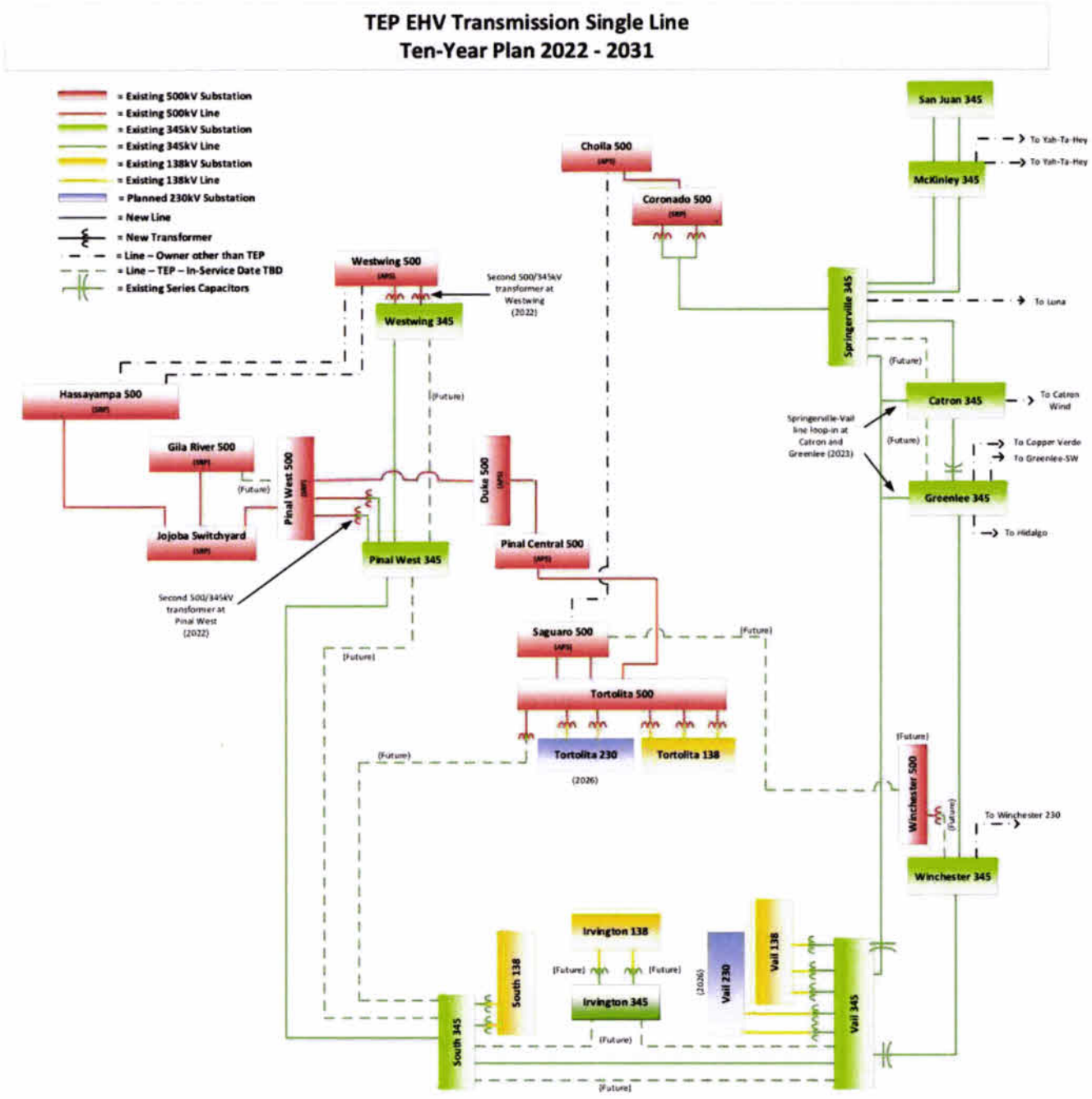

Figure 3: Existing and Planned EHV Transmission Facilities Single-Line Diagram

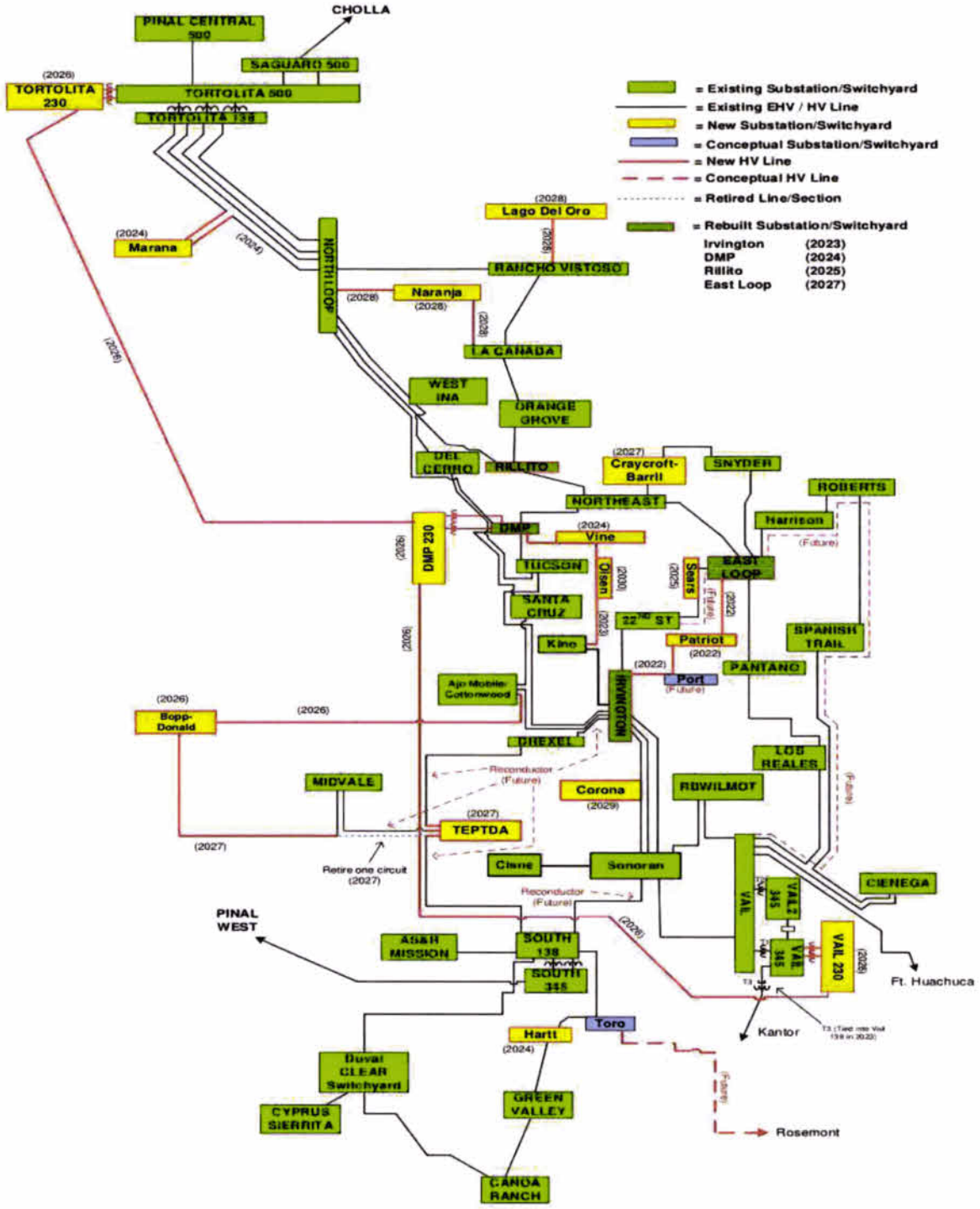

Figure 4: TEP Local Area HV Ten Year Transmission Plan

Completed EHV Transmission Project Descriptions[6]

[6] Projects in this section have been completed and will not be part of future Ten Year Plans

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Hassayampa – Pinal West 500-kV Line Loop-in to Jojoba Switchyard	
Facility Parameters:	
a) Voltage:	500-kV
b) Capacity:	System dependent
c) Point of Origin:	Jojoba substation
d) Point of Termination:	Interconnection with existing Hassayampa – Pinal West line
e) Length:	Less than 3 spans
Routing:	Drop existing line into existing switchyard
Purpose:	To provide connectivity between existing 500-kV transmission lines.
Date:	
a) Construction Start:	2021
b) In-Service Date:	2021
Is Certificate Necessary:	Certificate is part of Case No.124
Technical Studies:	SRP Interconnection and Facilities studies. Path Rating study conducted by TEP for path owners.

Completed EHV Reactive Project Descriptions[7]

[7] Projects in this section have been completed and will not be part of future Ten Year Plans

Planned EHV Transmission Project Descriptions

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Addition of second 500/345kV transformer at Pinal West substation	
Facility Parameters:	
a) Voltage:	500/345kV
b) Capacity:	System dependent
c) Point of Origin:	Pinal West
d) Point of Termination:	Pinal West
e) Length:	N/A
Routing:	N/A
Purpose:	To increase Total Transfer Capability in response to a customer transmission service request
Date:	
a) Construction Start:	2022
b) In-Service Date:	2022
Is Certificate Necessary:	No
Technical Studies:	Interconnection Studies

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Addition of second 500/345kV transformer at Weswing substation	
Facility Parameters:	
a) Voltage:	500/345kV
b) Capacity:	System dependent
c) Point of Origin:	Westwing
d) Point of Termination:	Westwing
e) Length:	N/A
Routing:	N/A
Purpose:	To increase Total Transfer Capability in response to a customer transmission service request
Date:	
a) Construction Start:	2022
b) In-Service Date:	2022
Is Certificate Necessary:	No
Technical Studies:	Interconnection Studies

Planned EHV Reactive Project Descriptions

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Greenlee Capacitor Bank Addition	
Facility Parameters:	
a) Voltage:	345-kV
b) Capacity:	Four (4) - 50 MVAC
c) Point of Origin:	Greenlee Substation
d) Point of Termination:	Greenlee Substation
e) Length:	N/A
Routing:	N/A
Purpose:	Voltage support of the TEP EHV facilities.
Date:	
a) Construction Start:	2022
b) In-Service Date:	2023
Is Certificate Necessary:	No
Technical Studies:	Annual TEP planning studies.

Conceptual EHV Transmission Project Descriptions

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Saguaro Substation to Winchester Substation	
Facility Parameters:	
a) Voltage:	500-kV
b) Capacity:	System dependent
c) Point of Origin:	Saguaro Substation
d) Point of Termination:	Winchester Substation
e) Length:	Approximately 80 miles
Routing:	In accordance with the CEC approved in Decision No. 46801 (January 23, 1976).
Purpose:	To reinforce TEP's transmission system and to provide additional capacity for the flow of power from the Palo Verde area into TEP's eastern transmission system.
Date:	
a) Construction Start:	TBD
b) In-Service Date:	TBD
Is Certificate Necessary:	Certificate is part of Case No. 23 (CEC held by SRP)
Technical Studies:	Progress monitored via SWAT and internal TEP study efforts.

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Vail Substation to South Substation – 2nd Circuit	
Facility Parameters:	
a) Voltage:	345-kV or 500-kV
b) Capacity:	System dependent
c) Point of Origin:	Vail Substation (Sec. 4 T16S R15E)
d) Point of Termination:	South Substation (Sec. 36 T16S R13E)
e) Length:	14 miles
Routing:	Parallel and adjacent to existing Vail – South Line.
Purpose:	To reinforce TEP's transmission system and to provide additional transmission capacity between Vail and South Substations.
Date:	
a) Construction Start:	TBD
b) In-Service Date:	TBD
Is Certificate Necessary:	Precedes establishment of CEC requirements
Technical Studies:	Studies conducted in coordination with neighboring utilities formed the basis for the design of TEP's original EHV facilities in the 1970's. This project is based on that original work. Detailed studies will be performed in the future upon a determination of need for this project by TEP.

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Springerville Substation to Greenlee Substation - 3rd Circuit	
Facility Parameters:	
a) Voltage:	345-kV
b) Capacity:	System dependent
c) Point of Origin:	Springerville Substation (Sec. 34 T11N R30E)
d) Point of Termination:	Greenlee Substation (Sec. 29 T5S R31E)
e) Length:	110 miles total, 27 miles in Arizona
Routing:	Parallel and adjacent to existing Springerville to Greenlee lines.
Purpose:	To reinforce TEP's transmission system and to provide additional transmission capacity between Vail and South Substations.
Date:	
a) Construction Start:	TBD
b) In-Service Date:	TBD
Is Certificate Necessary:	Certificate is part of Case No. 12, 30, 63 and 73
Technical Studies:	Studies conducted in coordination with neighboring utilities formed the basis for the design of TEP's original EHV facilities in the 1970's. This project is based on that original work. Detailed studies will be performed in the future upon a determination of need for this project by TEP.

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Tortolita Substation to South Substation	
Facility Parameters:	
a) Voltage:	345-kV
b) Capacity:	System dependent
c) Point of Origin:	Tortolita Substation (Sec. 23 T10S R10E)
d) Point of Termination:	South Substation (Sec. 36 T16S R13E)
e) Length:	68 miles
Routing:	From Tortolita Substation south through Avra Valley to existing Westwing-South 345-kV transmission line right-of-way, then parallel and adjacent to existing Westwing – South line to South Substation.
Purpose:	To reinforce TEP's transmission system and to provide additional capacity for the flow of power in Southern Arizona.
Date:	
a) Construction Start:	TBD
b) In-Service Date:	TBD
Is Certificate Necessary:	Certificate is part of Case No. 50
Technical Studies:	Studies conducted in coordination with neighboring utilities formed the basis for the design of TEP's original EHV facilities in the 1970's. This project is based on that original work. Detailed studies will be performed in the future upon a determination of need for this project by TEP.

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Westwing Substation to South Substation – 2nd Circuit	
Facility Parameters:	
a) Voltage:	345-kV or 500-kV
b) Capacity:	System dependent
c) Point of Origin:	Westwing Substation (Sec. 12 T4N R1W)
d) Point of Termination:	South Substation (Sec. 36 T16S R13E)
e) Length:	178 miles
Routing:	Parallel and adjacent to existing Westwing to South line and will include loop-in to Pinal West.
Purpose:	To deliver power and energy from major TEP interconnections in the Northwest Phoenix region.
Date:	
a) Construction Start:	TBD
b) In-Service Date:	TBD
Is Certificate Necessary:	Certificate is part of Case No. 15
Technical Studies:	Studies conducted in coordination with neighboring utilities formed the basis for the design of TEP's original EHV facilities in the 1970's. This project is based on that original work. Detailed studies will be performed in the future upon a determination of need for this project by TEP.

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Gila River to Pinal West 500-kV Transmission Line	
Facility Parameters:	
a) Voltage:	500-kV
b) Capacity:	System dependent
c) Point of Origin:	Gila River Switchyard
d) Point of Termination:	Pinal West Substation
e) Length:	37 to 50 miles depending upon routing
Routing:	TBD
Purpose:	Proposed joint project by TEP and American Southwest Transmission Company ("ASWTC"), to reinforce the existing transmission grid and increase capacity between the Gila River Power Plant and points east.
Date:	
a) Construction Start:	TBD
b) In-Service Date:	TBD
Is Certificate Necessary:	Yes
Technical Studies:	Studies in progress via TEP and ASWTC.

Conceptual EHV Reactive Project Descriptions

Completed HV Transmission Project Descriptions[8]

[8] Projects in this section have been completed and will not be part of future Ten Year Plans

No HV Planned Transmission projects were completed between February 1, 2021 and January 31, 2022.

Completed Reactive HV Project Descriptions[9]

[9] Projects in this section have been completed and will not be part of future Ten Year Plans

Planned HV Transmission Project Descriptions

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Irvington 138 kV Transmission Line Relocation	
Facility Parameters:	
a) Voltage:	138-kV
b) Capacity:	System dependent
c) Point of Origin:	Existing Irvington Substation
d) Point of Termination:	New Irvington Substation
e) Length:	Approximately 2.25 Miles of new construction
Routing:	On existing TEP owned property
Purpose:	Re-configuration of transmission lines terminating into the Irvington substation due to the relocation of the Irvington substation.
Date:	
a) Construction Start:	2018
b) In-Service Date:	2023
Is Certificate Necessary:	Certificate is part of Case No. 177
Technical Studies:	Annual TEP planning studies.

TEP Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Irvington 138-kV Substation – East Loop 138-kV Substation Transmission Line with loop-in at the planned Patriot 138-kV Substation and future Port 138-kV Substation	
Facility Parameters:	
a) Voltage:	138-kV
b) Capacity:	System dependent
c) Point of Origin:	Irvington 138-kV Substation
d) Interim Point:	Future Port 138-kV Substation
e) Interim Point:	Planned Patriot 138-kV Substation
f) Point of Termination:	East Loop 138-kV Substation
g) Length:	Irvington – East Loop: 13 miles (Total) • Phase 1: Irvington Substation to East Loop Substation with loop-in at Patriot Substation (planned) • Phase 2: Loop-in of Irvington – Patriot line to Port Substation
Routing:	Beginning at the existing Irvington substation, travelling southeasterly to Littletown Road. From Littletown, the transmission line continues east to the intersection of Littletown and Kolb Roads. The line continues north to the intersection of Escalante and Kolb Road to a point of planned interconnection with the planned Patriot substation. The line continues east along Escalante to the intersection of Escalante and Pantano Roads. At this point the line turns north on Pantano to connect into the East Loop substation.
Purpose:	To connect the planned Patriot 138/13.8 kV Substation and Port 138/13.8 kV Substation to the TEP transmission system.
Date:	
a) Construction Start:	2022
b) In-Service Date:	• Phase 1: 2023 • Phase 2: TBD
Is Certificate Necessary:	Certificate is part of Case No. 186
Technical Studies:	Annual TEP planning studies.

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Planned Kino 138-kV Substation – DeMoss Petrie (DMP) 138-kV Substation with loop-in at planned Vine 138-kV Substation	
Facility Parameters:	
a) Voltage:	138-kV
b) Capacity:	System dependent
c) Point of Origin:	Planned Kino 138-kV Substation
d) Interim Point:	Planned Vine Substation
e) Point of Termination:	DMP 138-kV Substation
f) Length:	Approximately 7 miles
Routing:	TBD
Purpose:	To loop-in planned Vine Substation into the TEP transmission system and network Kino Substation into the transmission system.
Date:	
a) Construction Start:	2022
b) In-Service Date:	2024
Is Certificate Necessary:	Yes
Technical Studies:	Annual TEP planning studies. Load Saturation Study for the TEP load pocket.

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Loop-in of Tortolita – North Loop into future Marana 138-kV Substation	
Facility Parameters:	
a) Voltage:	138-kV
b) Capacity:	System dependent
c) Point of Origin:	Tortolita 138-kV Substation
d) Interim Point	Planned Marana 138-kV Substation
e) Point of Termination:	North Loop 138-kV Substation
f) Length:	Approximately 19 miles
Routing:	TBD
Purpose:	Required to connect the future Marana 138/13.8 kV Substation to the TEP transmission system.
Date:	
a) Construction Start:	2023
b) In-Service Date:	2024
Is Certificate Necessary:	Yes
Technical Studies:	Annual TEP planning studies.

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Vail to Tortolita 230-kV Transmission Line	
Facility Parameters:	
a) Voltage:	230-kV
b) Capacity:	System dependent
c) Point of Origin:	Vail Substation
d) Intermediate Point	DeMoss Petrie (DMP) Substation
d) Point of Termination:	Tortolita Substation
e) Length:	64 miles
Routing:	Tortolita – Vail: 64 miles (Total) • Phase 1: 36 mile 230kV line traversing north along the existing Western Area Power Administration (WAPA) corridor from existing Tucson Electric Power (TEP) DeMoss Petrie substation to the Pima/Pinal County border where it turns east/northeast to the existing TEP Tortolita substation. • Phase 2: 28 mile 230kV line from the existing TEP Vail substation, traveling due south where it intercepts the existing WAPA corridor and traverses this corridor in a northeast direction to the existing TEP DeMoss Petrie Substation.
Purpose:	A Project to improve the service and reliability to its customers. These improvements include: • A long-term plan to build a 230-kV loop around the city of Tucson to support its transmission system • Improve ability to schedule or respond to outages for maintenance, and; • A development-ready project that allows TEP to eliminate planned upgrades to TEP's transmission system that would otherwise be needed to address service and reliability needs.
Date:	
a) Construction Start:	• Phase 1: 2023 • Phase 2: 2025
b) In-Service Date:	• Phase 1: 2025 • Phase 2: 2027
Is Certificate Necessary:	Certificate is part of Case No. 173
Technical Studies:	Annual TEP Planning Studies.

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Loop-in of 22nd Street – East Loop 138-kV transmission line into future Sears-Wilmot 138-kV Substation	
Facility Parameters:	
a) Voltage:	138-kV
b) Capacity:	System dependent
c) Point of Origin:	22nd Street 138-kV Substation
d) Interim Point	Future Sears-Wilmot 138-kV Substation (to be constructed in 2025)
e) Point of Termination:	East Loop 138-kV Substation
f) Length:	Loop-in of existing line
Routing:	Loop-in a circuit from the 22nd Street – East Loop corridor alignment.
Purpose:	Required to connect the future Sears-Wilmot 138/13.8 kV Substation to the local 138-kV system.
Date:	
a) Construction Start:	2024
b) In-Service Date:	2025
Is Certificate Necessary:	TBD
Technical Studies:	Annual TEP planning studies.

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
North Loop 138-kV Substation – La Canada 138-kV Substation Transmission Line with loop-in at the planned Naranja 138-kV Substation	
Facility Parameters:	
a) Voltage:	138-kV
b) Capacity:	System dependent
c) Point of Origin:	North Loop 138-kV Substation
d) Interim Point	Future Naranja 138-kV Substation
e) Point of Termination:	La Canada 138-kV Substation
f) Length:	Approximately 13 miles
Routing:	TBD.
Purpose:	• Required to connect the future Naranja 138/13.8 kV Substation to the TEP transmission system. • Improve the reliability of the 138kV system East of North Loop
Date:	
a) Construction Start:	2027
b) In-Service Date:	2028
Is Certificate Necessary:	Yes
Technical Studies:	Annual TEP planning studies.

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Loop-in of future South – Green Valley 138-kV transmission line into future Hartt 138-kV	
Facility Parameters:	
a) Voltage:	138-kV
b) Capacity:	System dependent
c) Point of Origin:	South 138-kV Substation
d) Interim Point	Future Hartt 138-kV Substation (to be constructed in 2024)
e) Point of Termination:	Green Valley 138-kV Substation
f) Length:	Loop-in of existing line
Routing:	Loop the existing South – Green Valley 138-kV circuit and drop into future station adjacent to the right-of-way
Purpose:	Required to connect the future Hartt 138/13.8 kV Substation to the local 138-kV system.
Date:	
a) Construction Start:	2023
b) In-Service Date:	2024
Is Certificate Necessary:	TBD
Technical Studies:	Annual TEP planning studies.

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Planned Cottonwood to Future Bopp-Donald 138-kV Transmission Line	
Facility Parameters:	
a) Voltage:	138-kV
b) Capacity:	System dependent
c) Point of Origin:	Planned Cottonwood 138-kV Substation
d) Intermediate Point	N/A
d) Point of Termination:	Future Bopp-Donald 138-kV Substation
e) Length:	Approximately 8 miles
Routing:	TBD
Purpose:	Extend TEP's transmission system to the edge of TEP's service territory to alleviate reliability concerns in the area by providing network connectivity for existing and future customers and to accommodate resources to meet renewable resource expansion requirements outlines in TEP's 2020 Integrated Resource Plan. The customers in this portion of TEP's service territory are currently served by a long, 46-kV radial distribution line.
Date:	
a) Construction Start:	2025
b) In-Service Date:	2026
Is Certificate Necessary:	Yes
Technical Studies:	Annual TEP Planning Studies.

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Future Bopp-Donald to Midvale 138-kV Transmission Line	
Facility Parameters:	
a) Voltage:	138-kV
b) Capacity:	System dependent
c) Point of Origin:	Future Bopp-Donald 138-kV Substation
d) Intermediate Point	N/A
d) Point of Termination:	Midvale 138-kV Substation
e) Length:	Approximately 7 miles of new construction and 1 mile of existing construction (8 miles total)
Routing:	TBD
Purpose:	Extend TEP's transmission system to the edge of TEP's service territory to alleviate reliability concerns in the area by providing network connectivity for existing and future customers and to accommodate resources to meet renewable resource expansion requirements outlines in TEP's 2020 Integrated Resource Plan. The customers in this portion of TEP's service territory are currently served by a long, 46-kV radial distribution line.
Date:	
a) Construction Start:	2026
b) In-Service Date:	2027
Is Certificate Necessary:	Yes
Technical Studies:	Annual TEP Planning Studies.

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Interconnection of Drexel – Midvale 138-kV Transmission Line into future TEPTDA 138-kV Substation	
Facility Parameters:	
a) Voltage:	138-kV
b) Capacity:	System dependent
c) Point of Origin:	Drexel 138-kV Substation
d) Intermediate Point	Future TEPTDA 138-kV Substation
d) Point of Termination:	Midvale 138-kV Substation
e) Length:	Approximately ½ mile of new construction to loop-in to future TEPTDA substation.
Routing:	TBD
Purpose:	Extend TEP's transmission system to the edge of TEP's service territory to alleviate reliability concerns in the area by providing network connectivity for existing and future customers and to accommodate resources to meet renewable resource expansion requirements outlines in TEP's 2020 Integrated Resource Plan.
Date:	
a) Construction Start:	2026
b) In-Service Date:	2027
Is Certificate Necessary:	Yes
Technical Studies:	Annual TEP Planning Studies.

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Interconnection of Midvale – South 138-kV Transmission Line into future TEPTDA 138-kV Substation	
Facility Parameters:	
a) Voltage:	138-kV
b) Capacity:	System dependent
c) Point of Origin:	Midvale 138-kV Substation
d) Intermediate Point	Future TEPTDA 138-kV Substation
d) Point of Termination:	South 138-kV Substation
e) Length:	Approximately ½ mile of new construction to loop-in to future TEPTDA substation.
Routing:	TBD
Purpose:	Extend TEP's transmission system to the edge of TEP's service territory to alleviate reliability concerns in the area by providing network connectivity for existing and future customers and to accommodate resources to meet renewable resource expansion requirements outlines in TEP's 2020 Integrated Resource Plan.
Date:	
a) Construction Start:	2026
b) In-Service Date:	2027
Is Certificate Necessary:	Yes
Technical Studies:	Annual TEP Planning Studies.

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Future Lago del Oro 138-kV Substation – Rancho Vistoso 138-kV Substation	
Facility Parameters:	
a) Voltage:	138-kV
b) Capacity:	System dependent
c) Point of Origin:	Future Lago del Oro 138-kV Substation
d) Interim Point:	N/A
e) Point of Termination:	Rancho Vistoso 138 kV Substation
f) Length:	Approximately 8 miles
Routing:	TBD
Purpose:	To connect the future Lago del Oro 138/13.8 kV Substation to the TEP transmission system.
Date:	
a) Construction Start:	2027
b) In-Service Date:	2028
Is Certificate Necessary:	Yes
Technical Studies:	Annual TEP planning studies.

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Interconnection of Irvington – Sonoran 138-kV Transmission Line into future Corona 138-kV Substation	
Facility Parameters:	
a) Voltage:	138-kV
b) Capacity:	System dependent
c) Point of Origin:	Irvington 138-kV Substation
d) Interim Point	Future Corona 138-kV Substation
e) Point of Termination:	Sonoran 138-kV Substation
f) Length:	Approximately 1 mile from existing circuit
Routing:	Irvington – South Loop Corridor. Requires Approximately 1 mile of wire to drop into station.
Purpose:	Required to connect the future Corona 138/13.8 kV Substation to the local 138-kV system.
Date:	
a) Construction Start:	2028
b) In-Service Date:	2029
Is Certificate Necessary:	Yes
Technical Studies:	Annual TEP planning studies.

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Interconnection of future Vine – Kino 138-kV Transmission Line into future Olsen 138-kV Substation	
Facility Parameters:	
a) Voltage:	138-kV
b) Capacity:	System dependent
c) Point of Origin:	Future Vine 138-kV Substation
d) Interim Point	Future Olsen 138-kV Substation
e) Point of Termination:	Kino 138-kV Substation
f) Length:	Approximately 1 mile from existing circuit
Routing:	Requires approximately 1 mile of wire to drop into station.
Purpose:	Required to connect the future Olsen 138/13.8 kV Substation to the local 138-kV system.
Date:	
a) Construction Start:	2029
b) In-Service Date:	2030
Is Certificate Necessary:	TBD
Technical Studies:	Annual TEP planning studies.

Planned HV Reactive Project Descriptions

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Orange Grove Capacitor Bank Addition	
Facility Parameters:	
a) Voltage:	138-kV
b) Capacity:	One (1) – 26.4 MVAC
c) Point of Origin:	Orange Grove Substation
d) Point of Termination:	Orange Grove Substation
e) Length:	N/A
Routing:	N/A
Purpose:	Voltage support of the TEP HV system.
Date:	
a) Construction Start:	2024
b) In-Service Date:	2025
Is Certificate Necessary:	No
Technical Studies:	Annual TEP planning studies.

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Naranja Capacitor Bank Addition	
Facility Parameters:	
a) Voltage:	138-kV
b) Capacity:	One (1) – 26.4 MVAC
c) Point of Origin:	Naranja Substation
d) Point of Termination:	Naranja Substation
e) Length:	N/A
Routing:	N/A
Purpose:	Voltage support of the TEP HV system.
Date:	
a) Construction Start:	2027
b) In-Service Date:	2028
Is Certificate Necessary:	No
Technical Studies:	Annual TEP planning studies.

Conceptual HV Transmission Project Descriptions

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Vail Substation to East Loop Substation through Spanish Trail and Roberts Substations, looping-in the Roberts-East Loop line to the future Harrison Substation	
Facility Parameters:	
a) Voltage:	138-kV
b) Capacity:	System dependent
c) Point of Origin:	Vail Substation (Sec. 4 T16S R15E)
d) Point of Termination:	East Loop Substation (Sec. 8 T14S R15E)
e) Length:	1. Phase 1: Vail Substation to East Loop Substation: 22 miles 2. Phase 2: East Loop – Roberts – 7 miles, Spanish Trail to Roberts – 5.75 miles 3. Phase 3: Vail Substation to East Loop Substation: 22 miles (2nd circuit) 4. Phase 4: East Loop – future Harrison: Approximately 3 miles Roberts – future Harrison – approximately 4 miles
Routing:	East and north from Vail Substation along existing transmission line to Irvington and Houghton Roads, then north along Houghton Road to Speedway Boulevard, then east and north to Roberts Substation and west along Speedway to East Loop Substation.
Purpose:	To provide additional electric service to the eastern portion of TEP's service area and to reinforce the transmission system.
Date:	
a) Construction Start:	1976
b) In-Service Date:	1. Phase 1: Completed, 1977 (Spanish Trail Substation to East Loop and Vail Substation.) 2. Phase 2: Completed, 1983 (Roberts Substation and associated 138-kV lines.) 3. Phase 3: TBD 4. Phase 4: 2022 (Loop-in of the existing Roberts –East Loop 138-kV circuit and drop into future Harrison 138-kV Substation adjacent to the right-of-way.)
Is Certificate Necessary:	Certificate is part of Case No. 8
Technical Studies:	Annual TEP planning studies.

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Irvington Substation to East Loop Substation	
Facility Parameters:	
a) Voltage:	138-kV
b) Capacity:	System Dependent
c) Point of Origin:	Irvington Substation (Sec. 03 T15S R14E)
d) Point of Termination:	East Loop Substation (Sec. 08 T14S R15E)
e) Length:	Irvington – East Loop: 9 miles (Total) • Phase 1: Irvington Substation to 22nd Street Substation: 4 miles • Phase 2: 22nd Street to East Loop Substation: 5 miles
Routing:	North and East of Irvington Substation, through 22nd Street Substation, then East and North to East Loop Substation.
Purpose:	To provide additional electric service to the central area of TEP's service area and to reinforce the TEP transmission system.
Date:	
a) Construction Start:	1985
b) In-Service Date:	• Phase 1: Completed, 1994 (Irvington Substation to 22nd Street Substation.) • Phase 2: Completed, 2000 (22nd Street Substation to East Loop Substation.) • Phase 3: TBD (2nd circuit of Phase 1.)
Is Certificate Necessary:	Certificate is part of Case No. 66
Technical Studies:	Annual TEP planning studies.

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Irvington – Drexel – Midvale - South 138-kV Line Re-Conductor	
Facility Parameters:	
a) Voltage:	138-kV
b) Capacity:	System Dependent
c) Point of Origin:	Irvington Substation
d) Interim Point:	Drexel Substation
e) Interim Point:	Midvale Substation
f) Point of Termination:	South Substation
g) Length:	Approximately 18 Miles
Routing:	Existing
Purpose:	To provide a higher rated path for potential future load growth
Date:	
a) Construction Start:	TBD
b) In-Service Date:	TBD
Is Certificate Necessary:	TBD
Technical Studies:	Annual TEP planning studies.

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Sonoran – South 138-kV Line Re-Conductor	
Facility Parameters:	
a) Voltage:	138-kV
b) Capacity:	System dependent
c) Point of Origin:	Sonoran Substation
d) Point of Termination:	South Substation
e) Length:	9.9 miles
Routing:	Existing
Purpose:	To provide a higher rated path for potential future load growth.
Date:	
a) Construction Start:	TBD
b) In-Service Date:	TBD
Is Certificate Necessary:	Yes
Technical Studies:	Annual TEP planning studies. Nogales Transmission System Impact Study Phase 2.

Tucson Electric Power	TRANSMISSION PROJECTS TEN-YEAR PLAN
Project Designation:	
Future Toro Switchyard to Rosemont Substation Radial 138-kV Distribution Line	
Facility Parameters:	
a) Voltage:	138-kV
b) Capacity:	TBD
c) Point of Origin:	Future Toro Switchyard that will be a loop-in of the TEP South – Green Valley 138-kV Line (Sec. 29 T17S R14E)
d) Point of Termination:	Future Rosemont Switchyard (Sec. 30 T18S R16E)
e) Length:	Approximately 13 miles
Routing:	Existing
Purpose:	To provide electrical service to a proposed large retail customer (mine load) located east of Green Valley, AZ
Date:	
a) Construction Start:	TBD
b) In-Service Date:	TBD (Dependent upon Rosemont Mine permitting process)
Is Certificate Necessary:	Certificate is part of Case No. 164
Technical Studies:	Annual TEP planning studies.

Conceptual HV Reactive Project Descriptions

Completed Generation Project Descriptions[10]

[10] Projects in this section have been completed and will not be part of future Ten Year Plans

No TEP owned generation projects were completed in Arizona between February 1, 2021 and January 31, 2022.

Planned Generation Project Descriptions

No TEP owned generation projects in Arizona are currently subject to reporting per ARS § 40-360.02 (B). Any changes to this will result in a separate filing for that project.

Conceptual Generation Project Descriptions

Attachment A: DG and EE Study Report

Tucson Electric Power

Study Report of the Effects of Distributed Renewable Generation and Energy Efficiency Programs

SUBMITTED TO THE
ARIZONA CORPORATION COMMISSION
JANUARY 31, 2022

Introduction

In the Sixth BTA, Decision No. 72031 (December 10, 2010), the Arizona Corporation Commission ("Commission") ordered jurisdictional utilities to address the effects of distributed renewable generation ("DG") and energy efficiency ("EE") programs on future transmission needs in their Ten-Year Plan filings. In the Eighth BTA, Decision No. 74785 (October 24, 2014), the Commission updated its original order such that a fifth-year technical study, down to the 115kV level, would be completed on the effects of DG and EE. This analysis was conducted to determine how the fifth year of the study would be affected with disaggregating load reductions through DG and EE programs from the retail customer load.

Case Development

The study was conducted using the case developed for the 2026 study year used in the development of Tucson Electric Power Company's ("TEP") Ten Year Plan ("TYP"). The case was developed from an approved Western Electric Coordinating Council ("WECC") base case.

Loads

Loads used were specifically developed for transmission planning for use in TEP's TYP. This forecast aggregates DG and EE programs into TEP's retail customer load. Forecasted DG and EE loads were provided from TEP's Rates & Revenue Requirements department. These loads were provided as of May 2021. An additional 5% stability margin was added to each load within the TEP transmission planning area. This stability margin is added to ensure compliance with WECC Criterion TPL-001-WECC-CRT-3.2 Transmission System Planning Performance. A summary of load contribution for the Loads used in the 2025 study year are provided in ***Table 1***.

Table 1: Load Summary

Area	Tucson	Rosemont[11]	Santa Cruz[12]	Thornydale	DG	EE	Net	Without DG & EE
Load	2445	N/A	131	29	142	238	2605	2985
w/5% Stability Margin	2574	N/A	138	31	149	250	2743	3142

Study Methodology

Power flow and dynamic analysis were conducted. The power flow analysis was used to identify thermal overloads under normal and contingency conditions that the performance measures of the NERC Transmission Planning Standards and WECC planning criteria effective at the time the study was conducted for Planning Events P0 through P7 as defined in NERC Standard TPL-001-4 and WECC Criterion TPL-001-WECC-CRT-3.2. Dynamic analysis was used to determine if any transient stability issues exist on the system or are introduced with the inclusion of new projects. No transient stability issues were identified within the studies.

As discussed previously, due to the way loads were modeled in the TEP's Ten Year Plan, EE and DG loads were added back into the fifth year case developed for the TYP. The newly developed case was then studied using the same criteria as that used in the development of the TYP. Results of the output were compared with results from the 2026 study year developed for the TYP.

[11] The current load forecast assumes that the proposed Rosemont Mine is now outside the ten year planning window. Rosemont Mine is included as a line item here to maintain consistency with previous Ten Year Plans.
[12] TEP provides transmission services to UNS Electric's service area in Santa Cruz County. The total load for Santa Cruz County includes a future mine, which has an expected in-service date of 2023 and expected to be at full capacity by 2024.

Results and Summary

TEP has completed an analysis with the effects of EE disaggregated from the balance of the load in the TEP system. No projects have been deferred or avoided based upon the inclusion of DG and EE. Avoided projects are defined as those which have not been identified in the TYP process and would be needed with the exclusion from effects of DG and EE. Deferred projects are already identified within the TYP process. By excluding the effects of DG and EE, these projects would be advanced to an earlier year.

EXHIBIT AEPCO-7

TRICO ELECTRIC COOPERATIVE LETTER OF SUPPORT

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibit.

ORIGINAL

TRICO
AN ENERGY COOPERATIVE

0000206850

RECEIVED

2022 MAY 24 P 2:10

AZ CORP COMMISSION
DOCKET CONTROL

May 23, 2022

Arizona Corporation Commission
1200 West Washington St
Phoenix, AZ 85007

Re: Letter of Support – Docket No. L-00000A-22-0102-00203 Saguaro to Marana 115/138kV Transmission Line Project

Chairman and Committee Members:

On behalf of Trico Electric Cooperative Inc. (Trico), I am writing to express Trico's support for Arizona Electric Power Cooperative's (AEPCO), application for a certificate of environmental compatibility (CEC) to construct the Saguaro – Marana transmission line project. Trico is a non-profit electric distribution cooperative located in Marana, Arizona. Trico provides electric service to residential, commercial, industrial and irrigation members in Pima, Santa Cruz, and Pinal counties. Trico is a Class A and partial requirements member of AEPCO.

This project is critical for the reliability of Trico's electric system and our members we serve. Northwest Pima and Pinal counties have seen significant growth over the past 10 years with a forecast for it to continue into the near future. This project will increase the transmission reliability in southern Arizona and will allow Trico to provide reliable service to both our current and future members.

Trico fully supports the approval of a CEC for this project. Thank you for your time and consideration in this matter.

Sincerely,

Brian Heithoff

Brian Heithoff
CEO and General Manager

Arizona Corporation Commission
DOCKETED
MAY 24 2022
DOCKETED BY

EXHIBIT AEPCO-8

EXHIBITS REGARDING NOTICE REQUIREMENTS

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibits regarding notice. The following sub-exhibits are attached.

Exhibit AEPCO-8A	Notice of Hearing
Exhibit AEPCO-8B	Affidavits of Publication and Tear Sheets for AZ Daily Star
Exhibit AEPCO-8C	Map of Notice of Hearing Sign Locations
Exhibit AEPCO-8D	Photographs of Sign Placement
Exhibit AEPCO-8E	Example of Sign Contents
Exhibit AEPCO-8F	Notice of Service to Affected Jurisdiction
Exhibit AEPCO-8G	Return Receipts of Affected Jurisdiction
Exhibit AEPCO-8H	Letter to Pima County re Documents for Public Viewing
Exhibit AEPCO-8I	Letter to Library re Documents for Public Viewing
Exhibit AEPCO-8J	Letter to Municipal Complex re Documents for Public Viewing

Exhibit AEPCO-8K Updated Hearing Signs

EXHIBIT AEPCO-8A

NOTICE OF HEARING

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibit.

BEFORE THE ARIZONA POWER PLANT
AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF ARIZONA ELECTRIC POWER COOPERATIVE, INC. OR ITS ASSIGNEES, IN CONFORMANCE WITH THE REQUIREMENTS OF A.R.S. § 40-360 et. seq., FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING THE SAGUARO TO MARANA 115 KV TRANSMISSION LINE PROJECT.

Docket No. L-00000A-22-0102-00203
Case No. 203

AMENDED NOTICE OF HEARING

A PUBLIC HEARING WILL BE HELD before the Arizona Power Plant and Transmission Line Siting Committee ("Committee") regarding the Application of Arizona Electric Power Cooperative, Inc. ("AEPCO") for a Certificate of Environmental Compatibility to authorize construction of authorizing construction of a 115 kilovolt ("kV") transmission line called the Saguaro to Marana 115/138 kV line ("Saguaro to Marana" or "the Project").

The Project consists of two separate transmission line configurations. One portion of the Project is a double-circuit 115/138 kV transmission line to be jointly owned by AEPCO and Tucson Electric Power Company ("TEP") (the 115 kV circuit will be owned and operated by AEPCO, and the 138 kV circuit will be owned and operated by TEP); the other portion of the Project is a single-circuit transmission line owned and operated by AEPCO alone. The transmission line originates at Trico Electric Cooperative's planned Adonis Substation. The location of the planned Adonis Substation enables AEPCO to connect to an existing transmission line, then interconnect to Arizona Public Service Company's ("APS") existing Saguaro Substation located approximately seven miles northwest of the planned Adonis Substation. In the future, TEP will connect its 138 kV circuit to TEP's existing 138 kV Quad Circuit adjacent to the planned Adonis Substation. The proposed double-circuit 115/138 kV transmission line would proceed west approximately four miles crossing Interstate 10, continuing to the intersection of Marana Road and Wentz Road. At the intersection of Marana Road and Wentz Road, the 138 kV line will be terminated for future use by TEP once a new substation location has been definitively located. From the intersection of Marana Road and Wentz Road, the line will proceed another four miles as a single circuit 115 kV transmission line to the existing AEPCO Marana Substation. A map of the Project is attached as **Exhibit A**.

The hearing will be held at the Northwest Fire Department Training Facility, located at 5125 West Camino de Fuego, Tucson, Arizona 85743. The hearing will begin on Monday, June 6, 2022, at 1:00 p.m., and will continue on Tuesday, June 7, 2022, at 9:00 a.m. and will continue as necessary on Wednesday, June 8,, 2022, Thursday, June 9, 2022, and Friday, June 10, 2022, commencing at 9:00 a.m. on each day through the completion of the hearing. If any revisions to the hearing schedule are required, they will be noticed on the Project website at: www.azgtsaguaromarana.com, and on the Arizona Corporation Commission ("Commission") website at: https://www.azcc.gov/arizona-power-plant/meeting-schedule.

PUBLIC COMMENT WILL BE TAKEN IN A SPECIAL EVENING SESSION ON MONDAY, JUNE 6, 2022, BEGINNING AT 5:30 P.M., VIA TELEPHONE, ZOOM OR IN PERSON AT THE NORTHWEST FIRE DEPARTMENT TRAINING FACILITY, 5125 W CAMINO DE FUEGO, TUCSON, AZ 85743. PUBLIC COMMENT MAY ALSO BE TAKEN AT OTHER TIMES DURING THE HEARING AT THE DISCRETION OF THE COMMITTEE CHAIRMAN.

PLEASE BE ADVISED THAT ALL LOCAL AND STATE PUBLIC HEALTH AND SAFETY GUIDELINES REGARDING COVID-19 WILL BE FOLLOWED DURING THE HEARING AND PUBLIC COMMENT SESSION. FURTHER RESTRICTIONS ON PUBLIC ACCESS, ADDITIONAL SAFETY PROTOCOLS, AND REVISIONS TO THE HEARING SCHEDULE MAY OCCUR DUE TO PUBLIC HEALTH CONSIDERATIONS.

THE PUBLIC IS STRONGLY ENCOURAGED TO PARTICIPATE BY EITHER WATCHING THE HEARING ONLINE OR LISTENING TO THE HEARING VIA TELEPHONE, RATHER THAN ATTENDING IN PERSON.

At least 24 hours in advance of the hearing, information regarding online and telephone hearing access, as well as any additional details regarding COVID-19 safety protocols or other revisions to the hearing schedule will be noticed on the Project website at www.azgtsaguaromarana.com. The Chairman may, at his discretion, recess the hearing to a time and place to be announced during the hearing, or to be determined after the recess. The date, time, and place at which the hearing will be resumed will be posted on the above-noted Project websites and the Commission website. **NOTE: NOTICE OF ANY RESUMED HEARING WILL BE GIVEN; HOWEVER, PUBLISHED NOTICE OF SUCH A RESUMED HEARING IS NOT REQUIRED.**

No tour of the Project area is planned by the Chairman at this time If the Chairman or Committee later decide to conduct a tour, notice that includes a map and itinerary of any such tour will be available at the hearing and posted on the Project website at www.azgtsaguaromarana.com, and on the Commission website at: https://www.azcc.gov/arizona-power-plant/meeting-schedule..

Maps of the Project site and detailed information about project facilities and technology are contained in the Application, which is available for inspection at the following locations:

- Arizona Corporation Commission Docket Control Center, Phoenix Office, 1200 West Washington Street, Suite 108, Phoenix AZ 85007
- Pima County Board of Supervisors, 33 N. Stone Ave., 11th Floor, Tucson, AZ 85701
- Marana Municipal Complex, 11555 W. Civic Center Drive, Marana, AZ 85653
- Wheeler Taft Abbett Sr. Library, 7800 N. Schisler Drive, Tucson, AZ 85743
- The Project Website: www.azgtsaguaromarana.com

The Applicant will make available final copies of the pre-filing conference, prehearing conference, and hearing transcripts at each of the above locations and website.

Each county, municipal government, and state agency interested in the Project that desires to be a party to the proceedings shall, not less than ten (10) days before the date set for the hearing, file a Notice of Intent to Become a Party with the Director of Utilities, Arizona Corporation Commission, 1200 West Washington Street, Phoenix AZ 85007.

Any domestic non-profit corporation or association formed in whole or in part to promote conservation or natural beauty; to protect the environment, personal health or other biological values; to preserve historical sites; to promote consumer interests; to represent commercial and industrial groups; or to promote the orderly development of the area in which the Project are located that desires to become a party to the proceedings shall, not less than ten (10) days before the date set for the hearing, file a Notice of Intent to Become a Party with the Director of Utilities, Arizona Corporation Commission, 1200 West Washington Street, Phoenix AZ 85007.

The Committee or the Chairman, at any time deemed appropriate, may make other persons parties to the proceedings. Any person may make a limited appearance at a hearing by filing a statement in writing with the Director of Utilities, Arizona Corporation Commission, 1200 West Washington Street, Phoenix AZ 85007, not less than five (5) days before the date set for the hearing. A person making a limited appearance will not be a party or have the right to present testimony or cross-examine witnesses.

This proceeding is governed by Arizona Revised Statutes ("A.R.S.") §§ 40-360 to 40-360.13 and Arizona Administrative Code ("A.A.C.") R14-3-201 to R14-3-220. No substantive communication, not in the public record, may be made to any member of the Committee. The written decision of the Committee will be submitted to the Commission pursuant to A.R.S. § 40-360.07. Any person intending to be a party to the proceeding on the matter before the Committee must be a party to the proceeding before the Committee.

ORDERED this 3rd day of May, 2022.

Paul A. Katz, Chairman
Arizona Power Plant and Transmission
Line Siting Committee
Assistant Attorney General

Exhibit A

Published May 6 & 7, 2022 • Arizona Daily Star

EXHIBIT AEPCO-8B

AFFIDAVITS OF PUBLICATION AND TEAR SHEETS FOR AZ DAILY STAR

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibit.

ARIZONA DAILY STAR

Tucson, Arizona

STATE OF ARIZONA)
COUNTY OF PIMA)

Debbie Sanchez, being first duly sworn deposes and says: that she is the Advertising Representative of **TNI PARTNERS,** a General Partnership organized and existing under the laws of the State of Arizona, and that it prints and publishes the Arizona Daily Star, a daily newspaper printed in Phoenix, AZ and published in the City of Tucson, Pima County, State of Arizona, and having a general circulation in said City, County, State and Cochise and Santa Cruz Counties, and that the attached ad was printed and

Legal Notice

published correctly in the entire issue of the said Arizona Daily Star on each of the following dates, to-wit:

MAY 6 & 7, 2022

Debbie Sanchez

Subscribed and sworn to before me this 9th day of MAY, 2022

Lydia Fimbres

Notary Public

LYDIA FIMBRES
Notary Public - Arizona
Pima County
Commission # 572658
My Comm. Expires Oct 18, 2023

My commission expires

AD NO. TUC0038015

BEFORE THE ARIZONA POWER PLANT AND TRANSMISSION LINE SITING COMMITTEE
Paul A. Katz, Chairman
Arizona Power Plant and Transmission Line Siting Committee
Exhibit A Assistant Attorney General
IN THE MATTER OF THE APPLICATION OF ARIZONA ELECTRIC POWER COOPERATIVE, INC. OR ITS ASSIGNEES, IN CONFORMANCE WITH THE REQUIREMENTS OF A.R.S. § 40-360 et. seq., FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING THE SAGUARO TO MARANA 115 KV TRANSMISSION LINE PROJECT.
Docket No. L-00000A-22-0102-00203
Case No. 203
Published May 6 & 7, 2022 • Arizona Daily Star
AMENDED NOTICE OF HEARING
A PUBLIC HEARING WILL BE HELD before the Arizona Power Plant and Transmission Line Siting Committee ("Committee") regarding the Application of Arizona Electric Power Cooperative, Inc. ("AEPCO") for a Certificate of Environmental Compatibility to authorize construction of authorizing construction of a 115 kilovolt ("kV") transmission line called the Saguaro to Marana 115/138 kV line ("Saguaro to Marana" or "the Project").
The Project consists of two separate transmission line configurations. One portion of the Project is a double-circuit 115/138 kV transmission line to be jointly owned by AEPCO and Tucson Electric Power Company ("TEP") (the 115 kV circuit will be owned and operated by AEPCO, and the 138 kV circuit will be owned and operated by TEP); the other portion of the Project is a single-circuit transmission line owned and operated by AEPCO alone.
The transmission line originates at Trico Electric Cooperative's planned Adonis Substation. The location of the planned Adonis Substation enables AEPCO to connect to an existing transmission line, then interconnect to Arizona Public Service Company's ("APS") existing Saguaro Substation located approximately seven miles northwest of the planned Adonis Substation. In the future, TEP will connect its 138 kV circuit to TEP's existing 138 kV Quad Circuit adjacent to the planned Adonis Substation. The proposed double-circuit 115/138 kV transmission line would proceed west approximately four miles crossing Interstate 10, continuing to the intersection of Marana Road and Wentz Road. At the intersection of Marana Road and Wentz Road, the 138 kV line will be terminated for future use by TEP once a new substation location has been definitively located. From the intersection of Marana Road and Wentz Road, the line will proceed another four miles as a single circuit 115 kV transmission line to the existing AEPCO Marana Substation. A map of the Project is attached as Exhibit A.

PLEASE SEE ATTACHED E-TEARS

Trustees

TS No. 2022-00053-AZ

NOTICE OF TRUSTEE'S SALE

The following legally described trust property will be sold, pursuant to the power of sale under that certain Deed of Trust dated 04/25/2002 and recorded on 04/30/2002 as Instrument No. 20020830534, Book 11789 Page 2504 and rerecorded on as in the official records of Pima County, Arizona. **NOTICE! IF YOU BELIEVE THERE IS A DEFENSE TO THE TRUSTEE SALE OR IF YOU HAVE AN OBJECTION TO THE TRUSTEE SALE, YOU MUST FILE AN ACTION AND OBTAIN A COURT ORDER PURSUANT TO RULE 65, ARIZONA RULES OF CIVIL PROCEDURE, STOPPING THE SALE NO LATER THAN 5:00 P.M. MOUNTAIN STANDARD TIME OF THE LAST BUSINESS DAY BEFORE THE SCHEDULED DATE OF THE SALE, OR YOU MAY HAVE WAIVED ANY DEFENSES OR OBJECTIONS TO THE SALE. UNLESS YOU OBTAIN AN ORDER, THE SALE WILL BE FINAL AND WILL OCCUR** at public auction to the highest bidder At the East entrance to the Superior Court Building, 110 W. Congress, Tucson, AZ 85701, in Pima County, on 05/26/2022 at 11:30 AM of said day:

Legal Description:
LOT 25 OF WONDERLAND, ACCORDING TO THE MAP OF RECORD IN THE OFFICE OF THE COUNTY RECORDER OF PIMA COUNTY, ARIZONA IN BOOK 44 OF MAPS AND PLATS AT PAGE 45.

EXCEPT ALL COAL AND OTHER MINERALS AS RESERVED IN THE PATENT FROM THE UNITED STATES OF AMERICA.

Purported Street Address:
3840 S. KHE SANH LANE, TUCSON, AZ 85735

Tax Parcel Number:
212-38-3060

Original Principal Balance:
$ 74,298.00

NOTICE OF TRUSTEE'S SALE

Name and Address of Current Beneficiary:

Deutsche Bank National Trust Company, solely as Trustee for MASTR Specialized Loan Trust 2004-01, Mortgage Pass Through Certificates

c/o PHH Mortgage Corporation
1 Mortgage Way,
Mt. Laurel, NJ 08054

Name and Address of Original Trustor:

VICTOR D. JOHNSON II, A MARRIED MAN AS HIS SOLE AND SEPARATE PROPERTY

3840 S. KHE SANH LANE, TUCSON, AZ 85735

Name, Address and Telephone Number of Trustee:

Western Progressive - Arizona, Inc.
Northpark Town Center
1000 Abernathy Rd NE;
Bldg 400, Suite 200
Atlanta, GA 30328
(866) 960-8299

TERMS OF SALE: The trustee is only able to accept cash or a cash equivalent, like a cashier's check or certified check

NOTICE OF TRUSTEE'S SALE

SALE INFORMATION:
Sales Line: (866) 960-8299
Website: **https://www.altisource.com/loginpage.aspx**

If the sale is set aside for any reason, including if the Trustee is unable to convey title, the Purchaser at the sale shall be entitled only to a return of the monies paid to the Trustee. This shall be the Purchaser's sole and exclusive remedy. The Purchaser shall have no further recourse against the Trustor, the Trustee, the Beneficiary, the Beneficiary's Agent, or the Beneficiary's Attorney.

Western Progressive - Arizona, Inc.
/s/Glenda Hamilton
Glenda Hamilton,
Trustee Sale Assistant

DATED: February 11, 2022

Pursuant to A.R.S. 33 - 803(A)(6), the trustee herein qualifies as a trustee of the Deed of Trust in the trustee's capacity as a corporation all the stock of which is owned by Premium Title Agency, Inc., an escrow agent in the state of Arizona. The regulators of Premium Title Agency are the Arizona Department of Insurance and the Arizona Department of Financial Institutions. Western Progressive - Arizona, Inc. is registered with the Arizona Corporation Commission.

STATE OF Georgia
COUNTY OF Fulton

On February 11, 2022, before me, Tanesha Humphrey, Personally appeared Glenda Hamilton, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the preson(s), or the entity upon behalf of which the person(s) acted, executed the instrument

WITNESS my hand and official seal.

/s/Tanesha Humphrey,
Tanesha Humphrey,
NOTARY PUBLIC

TANESHA HUMPHREY
Notary Public Georgia
Gwinnett County My Commission Expires July 19, 2022

Published April 15, 22, 29, and May 6, 2022
Arizona Daily Star

Public Notices

*El Rio is currently soliciting proposals for Medical Equipment from Medical Supply Vendors and/or Manufactures to furnish and deliver to the University Clinic. Submittal Deadline: June 10, 2022, at 5:00pm AZ Time for details, see website at **https://www.elrio.org/about-elrio/rfps/.***"

Published May 2, 3, 4, 5, 6, 2022
Arizona Daily Star

BEFORE THE ARIZONA POWER PLANT AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF ARIZONA ELECTRIC POWER COOPERATIVE, INC. OR ITS ASSIGNEES, IN CONFORMANCE WITH THE REQUIREMENTS OF A.R.S. § 40-360 et. seq., FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING THE SAGUARO TO MARANA 115 KV TRANSMISSION LINE PROJECT.

Docket No. L-00000A-22-0102-00203
Case No. 203

AMENDED NOTICE OF HEARING

A PUBLIC HEARING WILL BE HELD before the Arizona Power Plant and Transmission Line Siting Committee ("Committee") regarding the Application of Arizona Electric Power Cooperative, Inc. ("AEPCO") for a Certificate of Environmental Compatibility to authorize construction of authorizing construction of a 115 kilovolt ("kV") transmission line called the Saguaro to Marana 115/138 kV line ("Saguaro to Marana" or "the Project").

The Project consists of two separate transmission line configurations. One portion of the Project is a double-circuit 115/138 kV transmission line to be jointly owned by AEPCO and Tucson Electric Power Company ("TEP") (the 115 kV circuit will be owned and operated by AEPCO, and the 138 kV circuit will be owned and operated by TEP); the other portion of the Project is a single-circuit transmission line owned and operated by AEPCO alone. The transmission line originates at Trico Electric Cooperative's planned Adonis Substation. The location of the planned Adonis Substation enables AEPCO to connect to an existing transmission line, then interconnect to Arizona Public Service Company's ("APS") existing Saguaro Substation located approximately seven miles northwest of the planned Adonis Substation. In the future, TEP will connect its 138 kV circuit to TEP's existing 138 kV Quad Circuit adjacent to the planned Adonis Substation. The proposed double-circuit 115/138 kV transmission line would proceed west approximately four miles crossing Interstate 10, continuing to the intersection of Marana Road and Wentz Road. At the intersection of Marana Road and Wentz Road, the 138 kV line will be terminated for future use by TEP once a new substation location has been definitively located. From the intersection of Marana Road and Wentz Road, the line will proceed another four miles as a single circuit 115 kV transmission line to the existing AEPCO Marana Substation. A map of the Project is attached as **Exhibit A**.

The hearing will be held at the Northwest Fire Department Training Facility, located at 5125 West Camino de Fuego, Tucson, Arizona 85743. The hearing will begin on Monday, June 6, 2022, at 1:00 p.m., and will continue on Tuesday, June 7, 2022, at 9:00 a.m. and will continue as necessary on Wednesday, June 8., 2022, Thursday, June 9, 2022, and Friday, June 10, 2022, commencing at 9:00 a.m. on each day through the completion of the hearing. If any revisions to the hearing schedule are required, they will be noticed on the Project website at: www.azgtsaguaromarana.com, and on the Arizona Corporation Commission ("Commission") website at: https://www.azcc.gov/arizona-power-plant/meeting-schedule.

PUBLIC COMMENT WILL BE TAKEN IN A SPECIAL EVENING SESSION ON MONDAY, JUNE 6, 2022, BEGINNING AT 5:30 P.M., VIA TELEPHONE, ZOOM OR IN PERSON AT THE NORTHWEST FIRE DEPARTMENT TRAINING FACILITY, 5125 W CAMINO DE FUEGO, TUCSON, AZ 85743. PUBLIC COMMENT MAY ALSO BE TAKEN AT OTHER TIMES DURING THE HEARING AT THE DISCRETION OF THE COMMITTEE CHAIRMAN.

PLEASE BE ADVISED THAT ALL LOCAL AND STATE PUBLIC HEALTH AND SAFETY GUIDELINES REGARDING COVID-19 WILL BE FOLLOWED DURING THE HEARING AND PUBLIC COMMENT SESSION. FURTHER RESTRICTIONS ON PUBLIC ACCESS, ADDITIONAL SAFETY PROTOCOLS, AND REVISIONS TO THE HEARING SCHEDULE MAY OCCUR DUE TO PUBLIC HEALTH CONSIDERATIONS.

THE PUBLIC IS STRONGLY ENCOURAGED TO PARTICIPATE BY EITHER WATCHING THE HEARING ONLINE OR LISTENING TO THE HEARING VIA TELEPHONE, RATHER THAN ATTENDING IN PERSON.

At least 24 hours in advance of the hearing, information regarding online and telephone hearing access, as well as any additional details regarding COVID-19 safety protocols or other revisions to the hearing schedule will be noticed on the Project website at www.azgtsaguaromarana.com. The Chairman may, at his discretion, recess the hearing to a time and place to be announced during the hearing, or to be determined after the recess. The date, time, and place at which the hearing will be resumed will be posted on the above-noted Project websites and the Commission website. **NOTE: NOTICE OF ANY RESUMED HEARING WILL BE GIVEN; HOWEVER, PUBLISHED NOTICE OF SUCH A RESUMED HEARING IS NOT REQUIRED.**

No tour of the Project area is planned by the Chairman at this time If the Chairman or Committee later decide to conduct a tour, notice that includes a map and itinerary of any such tour will be available at the hearing and posted on the Project website at www.azgtsaguaromarana.com, and on the Commission website at: https://www.azcc.gov/arizona-power-plant/meeting-schedule..

Maps of the Project site and detailed information about project facilities and technology are contained in the Application, which is available for inspection at the following locations:

- Arizona Corporation Commission Docket Control Center, Phoenix Office, 1200 West Washington Street, Suite 108, Phoenix AZ 85007
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- Marana Municipal Complex, 11555 W. Civic Center Drive, Marana, AZ 85653
- Wheeler Taft Abbett Sr. Library, 7800 N. Schisler Drive, Tucson, AZ 85743
- The Project Website: www.azgtsaguaromarana.com

The Applicant will make available final copies of the pre-filing conference, prehearing conference, and hearing transcripts at each of the above locations and website.

Each county, municipal government, and state agency interested in the Project that desires to be a party to the proceedings shall, not less than ten (10) days before the date set for the hearing, file a Notice of Intent to Become a Party with the Director of Utilities, Arizona Corporation Commission, 1200 West Washington Street, Phoenix AZ 85007.

Any domestic non-profit corporation or association formed in whole or in part to promote conservation or natural beauty; to protect the environment, personal health or other biological values; to preserve historical sites; to promote consumer interests; to represent commercial and industrial groups; or to promote the orderly development of the area in which the Project are located that desires to become a party to the proceedings shall, not less than ten (10) days before the date set for the hearing, file a Notice of Intent to Become a Party with the Director of Utilities, Arizona Corporation Commission, 1200 West Washington Street, Phoenix AZ 85007.

The Committee or the Chairman, at any time deemed appropriate, may make other persons parties to the proceedings. Any person may make a limited appearance at a hearing by filing a statement in writing with the Director of Utilities, Arizona Corporation Commission, 1200 West Washington Street, Phoenix AZ 85007, not less than five (5) days before the date set for the hearing. A person making a limited appearance will not be a party or have the right to present testimony or cross-examine witnesses.

This proceeding is governed by Arizona Revised Statutes ("A.R.S.") §§ 40-360 to 40-360.13 and Arizona Administrative Code ("A.A.C.") R14-3-201 to R14-3-220. No substantive communication, not in the public record, may be made to any member of the Committee. The written decision of the Committee will be submitted to the Commission pursuant to A.R.S. § 40-360.07. Any person intending to be a party to the proceeding on the matter before the Commission must be a party to the proceeding before the Committee.

ORDERED this 3rd day of May, 2022.

Paul A. Katz, Chairman
Arizona Power Plant and Transmission
Line Siting Committee
Assistant Attorney General

Exhibit A

Published May 6 & 7, 2022 • Arizona Daily Star

Public Notices

ARTICLES OF ORGANIZATION OF LIMITED LIABILITY COMPANY
ENTITY INFORMATION
ENTITY NAME:
LONE SAGUARO FINE CARPENTRY LLC
ENTITY ID: 23362296
ENTITY TYPE: Domestic LLC
EFFECTIVE DATE: 04/18/2022
CHARACTER OF BUSINESS: Any legal purpose
MANAGEMENT STRUCTURE: Member-Managed
PERIOD OF DURATION: Perpetual
PROFESSIONAL SERVICES: N/A
STATUTORY AGENT INFORMATION
STATUTORY AGENT NAME: United States Corporation Agents, Inc.
PHYSICAL ADDRESS: 17470 N. Pacesetter Way, SCOTTSDALE, AZ 85255
MAILING ADDRESS: 17470 N. Pacesetter Way, SCOTTSDALE, AZ 85255
PRINCIPAL ADDRESS
10780 S Piety Hill Dr., VAIL, AZ 85641
PRINCIPALS
Member: Andrew Emmanuel Muliett - 10780 S Piety Hill Dr., VAIL, AZ, USA --Date of Taking Office:
ORGANIZERS
Legalzoom.com, Inc.: 101 N Brand Blvd, 11th Floor, GLENDALE, CA, 91203, USA,
SIGNATURES Organizer: By: Cheyenne Moseley, Asst. Secretary of Legalzoom.com, Inc., A Delaware Corporation - 04/18/2022

Published May 4, 5 and 6, 2022
Arizona Daily Star

Public Notices

SUPERIOR COURT OF NEW JERSEY
CHANCERY DIVISION, FAMILY PART
BURLINGTON COUNTY
DOCKET NO.: FM-03-404-22W

TO: ROBERTO CAMPECH

By order of the Superior Court of New Jersey, wherein THEA E. CAMPECH, is the plaintiff, and you, ROBERTO CAMPECH, are the defendant, you are required to serve upon the plaintiff, KATHERINE GOMOLSON, ESQUIRE, PETRELLI PREVITERA, LLC, 210 NEW ROAD, #15, LINWOOD, NJ 08221, either (1) a written appearance in accordance with R. 5:4-3(a), or (2) an answer to the complaint on or before Friday, June 10, 2022, and if you fail to answer or file a written appearance in accordance with R. 5:4-3(a), judgment by default may be rendered against you for the relief demanded in the complaint; and further, you shall promptly file the answer or written appearance and proof of service thereof in duplicate with the matrimonial filing clerk in the Superior Court of Burlington County, located at 49 Rancocas Road, Mount Holly, NJ 08060 in accordance with the Rules of Civil Practice and Procedure. The telephone numbers for assistance in obtaining an attorney in the county in which this action is pending are: Lawyer Referral Service: (609) 261-4862; Legal Services Office: (800) 496-4570.

Published May 6, 2022
Arizona Daily Star

Announcements

Happy ads

Announcements

COPY CORRECTIONS: In spite of our best efforts, copy errors occasionally occur in material we typeset for our advertisers. If it happens to your ad, report it immediately. The advertiser is responsible for checking published ads for accuracy and notifying the company immediately of errors.

ACCEPTABLE ADVERTISING: In the interest of maintaining our standards of accuracy and good taste, the publishers of the Arizona Daily Star reserve the right to refuse or cancel advertising at any time. We cannot accept local brokered space. All advertising published in the Tucson Classified is subject to the current applicable rate card.

LIABILITY: Tucson's Newspapers and the Arizona Daily Star assume no liability for any incidental or consequential damages resulting from the omission or failure to publish any advertisement. Further, the Advertiser assumes all liability for statements contained in advertisements printed by Tucson Newspapers and agrees to hold Tucson Newspapers harmless of any claim that may be brought against Tucson's Newspapers in settlement of any such claim or in satisfaction of any judgment obtained thereon, and to pay all necessary expenses, including reasonable attorney's fees, incurred by Tucson Newspapers in defense or settlement of any such claim.

Lost-Found

If looking for a Found Pet look under Animals - Found Pets

If looking for a Lost Pet look under Animals - Lost Pets

THE ZEN OF STAR CLASSIFIED:
hmmmmmmmmm hmmmmmmmmm
It's amazing how life all starts to make sense once you get rid of the clutter in your life. Just follow these steps to make a positive change.
Step 1: breath in. *Step 2:* breathe out.
Step 3: call 573-4343
and place an ad in *the Star classified.*

Reader Notice:

The Arizona Daily Star verifies credit card information at the time a classified advertisement is placed. We do not call customers to re-verify that information. Should anyone claiming to represent the Daily Star contact you asking for such verification, do not give out the information. Report the incident to the Arizona Attorney General. That contact information:

Consumer Information and Complaints
consumerinfo@azag.gov

Tucson Office
400 West Congress
South Building, Suite 315
Tucson, AZ 85701-1367
(520) 628-6504
Fax (520) 628-6530

Garage sales

Market

neighborly deals...

Estate Sales

D&H ESTATE SALE
★ SAT, May 7th 8am-3pm ★

10698 E. Bridgeport St.
(DON'T MISS IT!)

2021 Jeep Renegade Sport
3,000 miles
HOUSE IS LOADED! 520-904-9411

SAFE SHIFT ESTATE RESALE,
Thurs, Fri, Sat, 8 to 3,
2801 E Grant
https://www.estatesales.net/AZ/Tucson/85716/3268623

'The Girls'
Estate Sale Professionals
& Estate Sale Shop
Tucson's #1 Estate
Sale Company!!!
745-6012
5/7/2022
8:00am - 3:00pm

820 W Peak Vista Pl 85737
From LaCanada & Lambert
Please follow our Red & White
'The Girls' Estate Sale
Directional Signs

At the Store
330 S Wilmot RD
Broadway & Wilmot

Stuffed to the gills

Time to clean out all that useless stuff the two of you have accumulated over the past few months.
Like, who needs dishes with flowers on them?

Basically, your place is filled with a bunch of useless stuff you've got to get rid ofand make room for your life.

Go to Star Classified and put an ad in the paper. ***Star Classified 573-4343***

Real Estate

Homes

starting fresh...

Real Estate Auctions

PUBLISHERS NOTICE: All real estate and rental advertised herein is subject to the Federal Fair Housing Act, which makes it illegal to advertise "any preference, limitation, or discrimination because of race, color, religion, sex, handicap, familial status, or national origin, or intention to make any such preference, limitation, or discrimination". We will not knowingly accept any advertising for real estate and rentals which is in violation of the law. All persons are hereby informed that all dwellings advertised are available on an equal opportunity basis.

Real Estate

Rentals

great places to live...

Apartments - Furnished

EARN FREE RENT! Furnished Studio Apartments w/FREE utilities & FREE cable. Stay Where You're Appreciated! Call Now: 520-214-5046

EARN FREE RENT! Stay Where You're Appreciated! Furnished Studio Apartments w/FREE utilities & FREE cable. Call Now: 520-441-8279

STUDIO & 1BR
Daily $59, Wk fr $325. 100 channel cable TV. All utils pd, incl furn, pool, laundry, linens. Free wi-fi! 10a-7p 797-1710 Oracle/Org Grove

Automotive

Wheels

best deal for you...

Cars

1984 JEEP CJ-7
Black, 5 speed, No AC, 1-owner, well maintained, 140k miles, $8,000. Text only. 202-210-8928

Stuffed to the gills

Time to clean out all that useless stuff the two of you have accumulated over the past few months.

Who needs dishes with flowers on them anyway?
I'd rather have a steak.
Go to Star Classified and put an ad in the paper.

Star Classified 573-4343

Animals

Find a Pet, Care Tips, Pet News and More at: **tucson.com/gadzoopets**

Adopt Me

Pets

all your favorites...

Domestic Pets

GOLDENDOODLE PUPPIES, white, 2M, 10-weeks, vet checked, 1st shots and 2nd-worming, $1200 each. 520-975-1869

ATTENTION!
Havapoo Puppies $900, 16 weeks, Males, Happy, loving, playful slittle31722@gmail.com 360-831-1966

PUGGLES PUPPIES, small M & F, also Lab/Great Pyrenees, large M & F mix puppies, all comes w/shots & deworming, pics avail, adoption fee. 520-221-8576

Domestic Pets

PUPPY, AUSTRALIAN SHEPHERD $400, 4 months, tricolor, female, socialized sharonrk9@gmail.com (520)255-4738

Found - Pets

LOOKING FOR YOUR LOST PET? If you can't find it in the Lost & Found Column, call or visit the following organizations:
Humane Society - 327-6088
635 W. Roger Rd.
www.petfinder.com
Pima Animal Care Center - 243-5900
4000 N. Silverbell Rd.
FOUND! PETS. Lost your pet? Check the Internet! FREE COMMUNITY SERVICE.
www.found-pets.org
Avicultural Society of Tucson
astbirdclub.org
Email: ASTTucson@hotmail.com
www.birdhotline.com A public service of Tucson Newspaper Classified.

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FREE COMMUNITY SERVICE.
www.found-pets.org,
Avicultural Society of Tucson
astbirdclub.org
Email: ASTTucson@hotmail.com
www.birdhotline.com A public service of Tucson Newspaper Classified.

SELL IT!
Star classifieds!
It's the resource you can count on to sell a myriad of merchandise items, because our columns compel qualified buyers to call!
Star classifieds 573-4343

Service Directory

To Advertise, please call **573-4343** or go to: **classifieds.tucson.com**

Air Conditioning

SCOTT GUERIN
HEATING & COOLING
Day & Night
INSTALLED PRICE
REPLACEMENTS FROM
14 SEER EQUIPMENT
3.0T - $5,900.00
4.0T - $6,700.00
5.0T - $7,000.00
GIVE US A CALL
(520) 648-2504

Child - Adult Care and Services

READER NOTICE: Ads in this section ARE NOT employment ads, but Services being offered. If you are seeking employment, please see the ads under JOBS.

Electrical

ALL YOUR ELECTRICAL needs. **LENNIE'S ELECTRIC.** Residential & Commercial. Simply The **Best!** 520-743-8797 or 440-0320 Lic. Credit cards

We're your animal's best friend. Advertise your animal to adopt or sell. ***Star classified 573-4343***

Handyman Services

FRED'S HANDYMAN SERVICE. Painting etc, we do all jobs big & small, free estimates, Lic #3063322. We take all major credit cards. 520-704-4402.

Landscaping

Fair Price YARD WORK
IRRIGATION, HAULING, CACTUS, TRASH, PACKRAT REMOVAL.
WE DO IT ALL!
909-6280

Franks Landscaping
We Do Weeds, Trees, And Hauling. We Also Do Block Work And Concrete. 520-373-8891

FRIENDLY DOT.COMMER I'M WHAT YOU'D CALL THE INSIDER'S RESOURCE TO TUCSON. THIS IS NOT A SITE FOR THE ENT. I TELL IT LIKE IT IS. YOU WANT TO KNOW ABOUT SPAS? I'M RIGHT THERE. HOW ABOUT RESTAURANTS? TRAVEL? SIGHTSEEING? SHOPPING? I'M YOUR DOT.COMMER. I'M WWW.TUCSON.COM/CLASSIFIEDS. LOOK ME UP SOMETIME.

Roofing - Siding

MM ROOFING
All Types of Roofs
FREE ESTIMATES
Roof Repairs Shingles Tile Roof Services Woodwork Roof Coating
CALL MIGUEL
520-907-2084
All Jobs Warrantied • 25 yrs Experience
Find a Licensed Contractor

MORGAN ROOFING
Tile • Shingles • Coatings
520-977-8690
Licensed, bonded, insured • Lic# ROC 331843
MorganRoofingLLC.com

Ride The Storm Roofing LLC
ROC #296676 Insured/bonded
Free estimates, small repairs, installations, coatings, tile, shingles, scupper & more 520-609-6287

Tree Service

LARGE & SMALL
TREE Removal/trim.
Stump removal, firewood.
Karl's 520-883-8001.
karlstreetrimingservice.com

BEFORE THE ARIZONA POWER PLANT
AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF ARIZONA ELECTRIC POWER COOPERATIVE, INC. OR ITS ASSIGNEES, IN CONFORMANCE WITH THE REQUIREMENTS OF A.R.S. § 40-360 et. seq., FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING THE SAGUARO TO MARANA 115 KV TRANSMISSION LINE PROJECT.

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- Wheeler Taft Abbett Sr. Library, 7800 N. Schisler Drive, Tucson, AZ 85743
- The Project Website: www.azgtsaguaromarana.com

The Applicant will make available final copies of the pre-filing conference, prehearing conference, and hearing transcripts at each of the above locations and website.

Each county, municipal government, and state agency interested in the Project that desires to be a party to the proceedings shall, not less than ten (10) days before the date set for the hearing, file a Notice of Intent to Become a Party with the Director of Utilities, Arizona Corporation Commission, 1200 West Washington Street, Phoenix AZ 85007.

Any domestic non-profit corporation or association formed in whole or in part to promote conservation or natural beauty; to protect the environment, personal health or other biological values; to preserve historical sites; to promote consumer interests; to represent commercial and industrial groups; or to promote the orderly development of the area in which the Project are located that desires to become a party to the proceedings shall, not less than ten (10) days before the date set for the hearing, file a Notice of Intent to Become a Party with the Director of Utilities, Arizona Corporation Commission, 1200 West Washington Street, Phoenix AZ 85007.

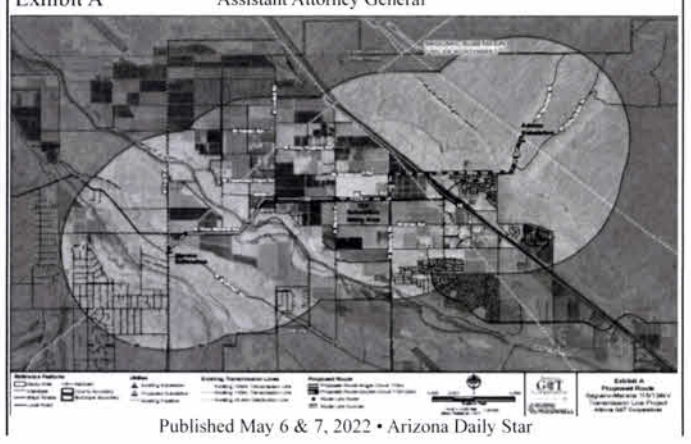
The Committee or the Chairman, at any time deemed appropriate, may make other persons parties to the proceedings. Any person may make a limited appearance at a hearing by filing a statement in writing with the Director of Utilities, Arizona Corporation Commission, 1200 West Washington Street, Phoenix AZ 85007, not less than five (5) days before the date set for the hearing. A person making a limited appearance will not be a party or have the right to present testimony or cross-examine witnesses.

This proceeding is governed by Arizona Revised Statutes ("A.R.S.") §§ 40-360 to 40-360.13 and Arizona Administrative Code ("A.A.C.") R14-3-201 to R14-3-220. No substantive communication, not in the public record, may be made to any member of the Committee. The written decision of the Committee will be submitted to the Commission pursuant to A.R.S. § 40-360.07. Any person intending to be a party to the proceeding on the matter before the Committee must be a party to the proceeding before the Committee.

ORDERED this 3rd day of May, 2022.

Paul A. Katz, Chairman
Arizona Power Plant and Transmission
Line Siting Committee
Assistant Attorney General

Exhibit A



Published May 6 & 7, 2022 • Arizona Daily Star

EXHIBIT AEPCO-8C

MAP OF NOTICE OF HEARING SIGN LOCATIONS

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibit.

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Saguaro to Marana 115/138kV Transmission Line Project
Hearing Notification Sign Locations

TEP Tucson Electric Power

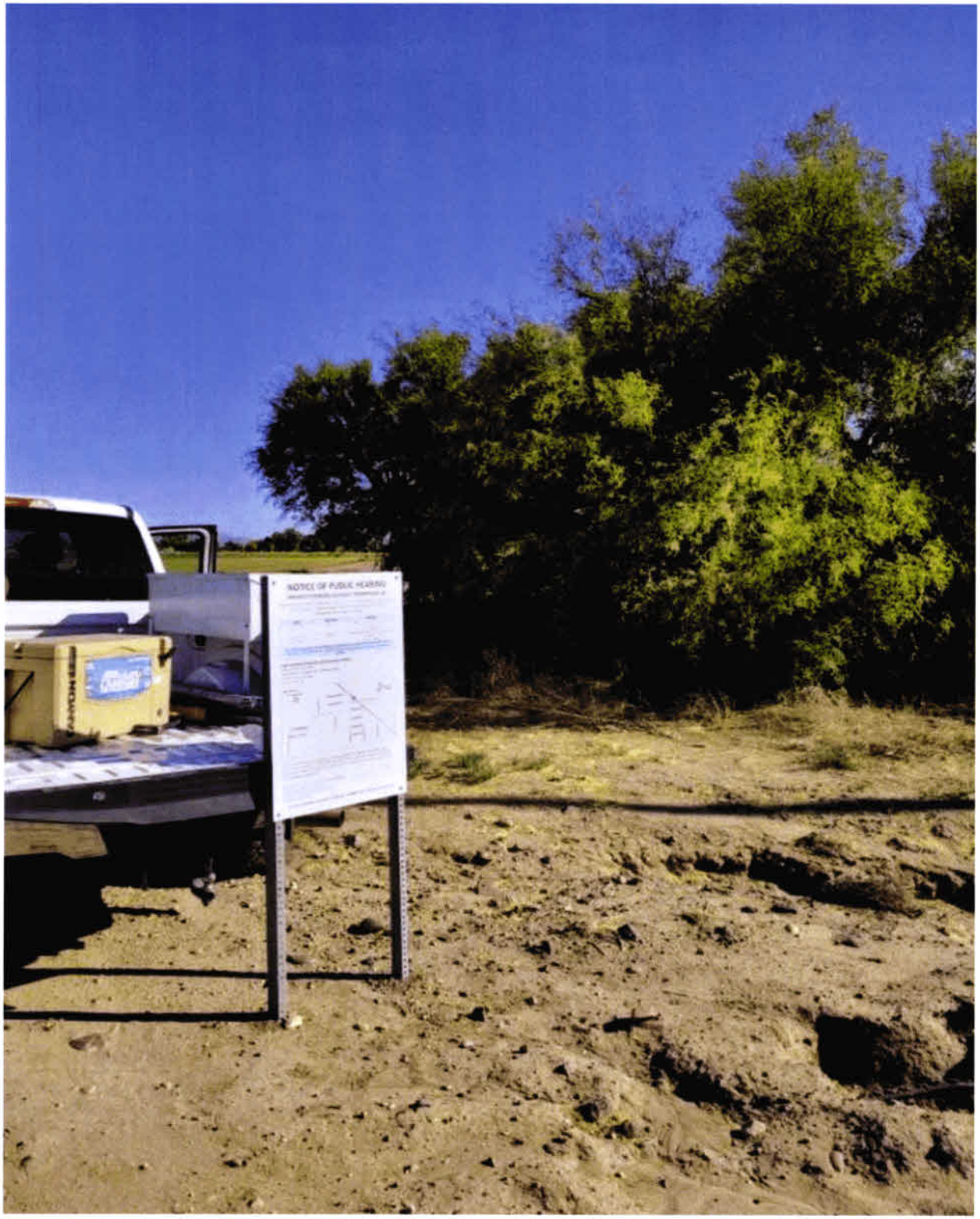
EXHIBIT AEPCO-8D

PHOTOGRAPHS OF SIGN PLACEMENT

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibit.


STOP
NOTICE OF PUBLIC HEARING


NOTICE OF PUBLIC HEARING


NOTICE OF PUBLIC HEARING


NOTICE OF PUBLIC HEARING
SAGUARO TO MARANA 115/138 kV TRANSMISSION LINE
Date
Start Time
Location

EXHIBIT AEPCO-8E

EXAMPLE OF SIGN CONTENTS

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibit.

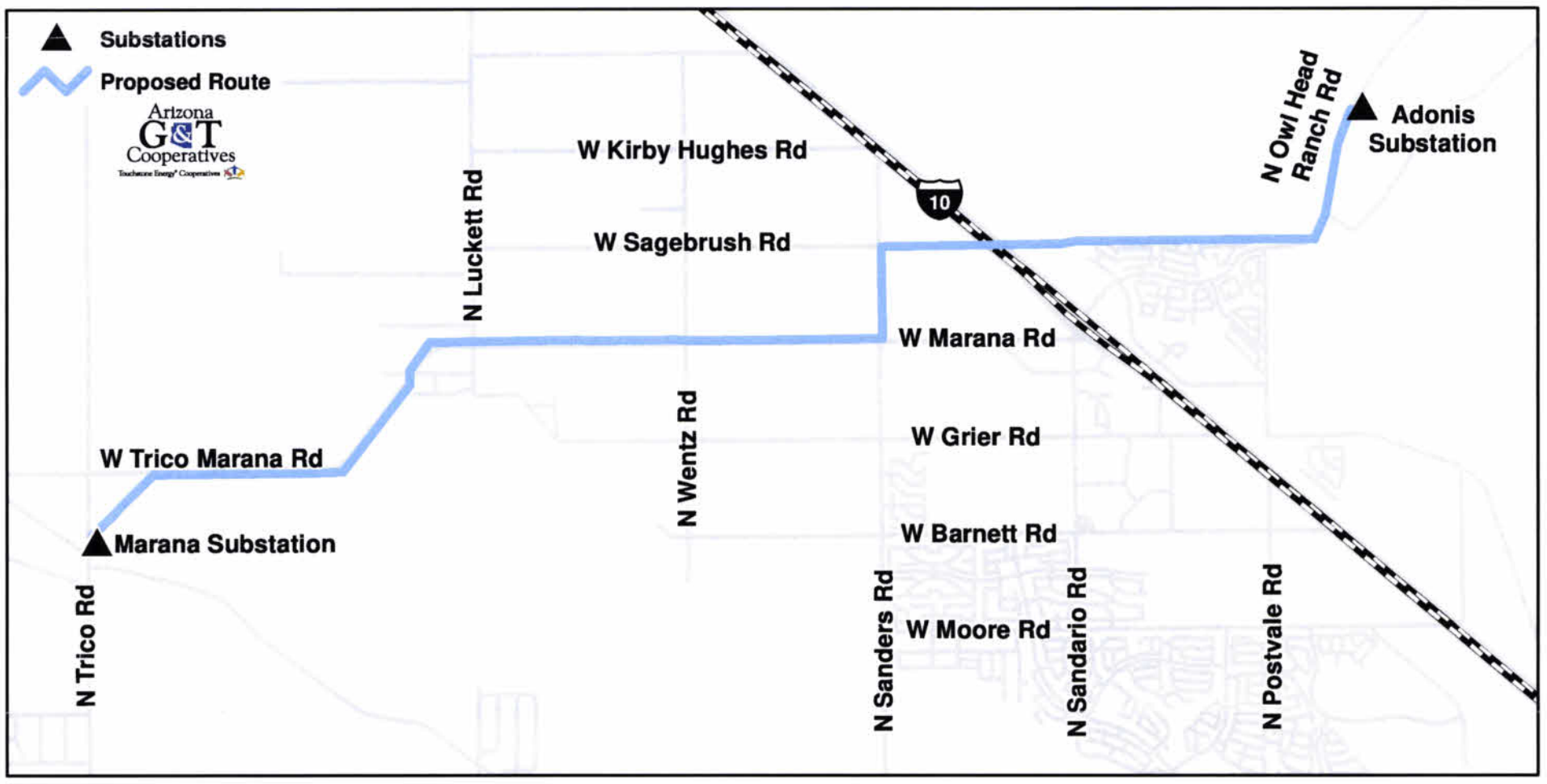
NOTICE OF PUBLIC HEARING

SAGUARO TO MARANA 115/138 kV TRANSMISSION LINE

Arizona Electric Power Cooperative, Inc. (AEPCO) invites the public to participate at the hearing for the above project before the Arizona Power Plant and Transmission Line Sitting Committee.

Date	Start Time	Location
June 6, 2022	1:00 p.m.	Northwest Fire Department Training Facility 5125 W Camino De Fuego Tucson, AZ 85743
June 7-10, 2022 (as needed)	9:00 a.m.	Northwest Fire Department Training Facility 5125 W Camino De Fuego Tucson, AZ 85743
Revision to the hearing or touring schedule and additional hearing days will be noticed on the Arizona Corporation Commission's website, available at: https://www.azcc.gov/arizona-power-plant/meeting-schedule		

Public Comment will be taken at the hearing as follows:
6:00 p.m. on June 6, 2022
at Northwest Fire Department Training Facility
5125 W Camino De Fuego
Tucson, AZ 85743



The Project will involve construction of approximately four miles of new double-circuit 115/138 kV transmission line from the proposed Adonis Substation to Wentz and Marana Road and four miles of new 115 kV transmission line from Wentz and Marana Road to the existing Marana Substation.

For more information, visit the following website:
https://azgtsaguaromarana.com/
Email us at: saguaromarana@azgt.coop
or call (520) 586-5252

Arizona Corporation Commission Docket No. L-00000A-22-0102-002203 (Case No. 203)

EXHIBIT AEPCO-8F

NOTICE OF SERVICE TO AFFECTED JURISDICTION

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibit.

ORIGINAL

0000206680

BEFORE THE ARIZONA POWER PLANT AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF ARIZONA ELECTRIC POWER COOPERATIVE, INC. OR ITS ASSIGNEES, IN CONFORMANCE WITH THE REQUIREMENTS OF A.R.S. § 40-360 et. seq., FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING THE SAGUARO TO MARANA 115 KV TRANSMISSION LINE PROJECT.	Docket No. L-00000A-22-0102-00203 Case No. 203 **NOTICE OF FILING LIST OF AFFECTED JURISDICTIONS**

Attorneys for Applicants, Arizona Electric Power Cooperative, Inc., hereby provide notice that on May 9, 2022, a copy of the Amended Notice of Hearing filed in this docket on May 9, 2022 was mailed to the following affected jurisdictions via certified mail with return receipt requested:

Terry Rozema, Town Manager
Town of Marana
Marana Municipal Complex
11555 W Civic Center Drive
Marana, AZ 85653

Chuck Huckelberry, County Administrator
Pima County
115 N. Church Ave.
2nd Floor, Suite 231
Tucson, Arizona 85701

Lisa A. Atkins, Commissioner
Arizona State Land Department
1616 W. Adams Street
Phoenix, Arizona 85007

RECEIVED
2022 MAY -9 P 12: 54
AZ CORP COMMISSION
DOCKET CONTROL

RESPECTFULLY SUBMITTED this 9th day of May, 2022.

OSBORN MALEDON, P.A.

By Meghan H. Grabel

Meghan H. Grabel
Osborn Maledon, PA
2929 North Central Ave. 21st Floor
Phoenix, Arizona 85012

Attorneys for Arizona Electric Power Cooperative, Inc.

Arizona Corporation Commission
DOCKETED
MAY 09 2022
DOCKETED BY

Original and 25 copies of the foregoing
Filed this 9th day of May, 2022, with:

Docket Control
ARIZONA CORPORATION COMMISSION
1200 West Washington Street
Phoenix, Arizona 85007

COPY of the foregoing emailed
This 9th day of May, 2022

Paul A. Katz, Chairman
Arizona Power Plant and Transmission Line Siting Committee
Arizona Attorney General Office
15 South 15th Avenue
Phoenix, Arizona 85007
Paul.Katz@azag.gov

Robin Mitchell, Director – Legal Division
ARIZONA CORPORATION COMMISSION
1200 W. Washington Street
Phoenix, Arizona 85007
rmitchell@azcc.gov
Counsel for Utilities Division Staff

Elijah Abinah, Director – Utilities Division
ARIZONA CORPORATION COMMISSION
1200 West Washington Street
Phoenix, Arizona 85007
eabinah@azcc.gov

Lisa L. Glennie
Glennie Reporting Services, LLC
1555 East Orangewood
Phoenix, Arizona 85020
admin@glennie-reporting.com
Court Reporter

By: Patricia D. Palmer

EXHIBIT AEPCO-8G

RETURN RECEIPTS OF AFFECTED JURISDICTION

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibit.

7008 0150 0001 1719 8794

OSBORN MALEDON
A PROFESSIONAL ASSOCIATION
ATTORNEYS AT LAW

2929 North Central Avenue
21st Floor
Phoenix, Arizona 85012

Lisa A. Atkins, Commissioner
Arizona State Land Department
1616 W. Adams Street
Phoenix, Arizona 85007

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

LISA A. ATKINS, Commissioner
ARIZONA STATE LAND Dept.
1616 W. ADAMS ST.
PHOENIX, AZ 85007

A. Signature

X ☐ Agent ☐ Addressee

B. Received by (Printed Name) | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☒ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service lab) 7008 0150 0001 1719 8794 -MHG

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

PLACE STICKER AT TOP OF ENVELOPE TO THE RIGHT

ER: COMPLETE THIS SECTION

omplete items 1, 2, and 3. Also complete
em 4 if Restricted Delivery is desired.
Print your name and address on the reverse
so that we can return the card to you.
Attach this card to the back of the mailpiece,
or on the front if space permits.

Article Addressed to:

LISA A. ATKINS, Commissioner
Arizona State Land Dept.
1616 W. Adams St.
Phoenix, AZ 85007

COMPLETE THIS SECTION ON DELIVERY

A. Signature
x Sharp ☒ Agent ☐ Addressee

B. Received by (Printed Name) Sharp
C. Date of Delivery 5/11/22

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☒ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

Article Number (Transfer from service lab) 7008 0150 0001 1719 8794 -MHC

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

7008 0150 0001 1719 8817

OSBORN MALEDON
A PROFESSIONAL ASSOCIATION
ATTORNEYS AT LAW

2929 North Central Avenue
21st Floor
Phoenix, Arizona 85012

Chuck Huckelberry, County Administrator
Pima County
115 N. Church Ave.
2nd Floor, Suite 231
Tucson, Arizona 85701

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Chuck Huckelberry, City Admin.
Pima County
115 N. Church Ave.
2nd Fl. Suite 231
Tucson, AZ 85701

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☒ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number
(Transfer from service lab 7008 0150 0001 1719 8817

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
Chuck Huckelberry, City Admin.
Pima County
115 N. Church Ave.
2nd Fl. Suite 231
Tucson, AZ 85701

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☒ Agent ☐ Addressee

B. Received by (Printed Name) Anthony Bacinski
C. Date of Delivery 5/11/22

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☒ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number
(Transfer from service lab 7008 0150 0001 1719 8817

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

7008 0150 0001 1719 8800

OSBORN MALEDON
A PROFESSIONAL ASSOCIATION
ATTORNEYS AT LAW

2929 North Central Avenue
21st Floor
Phoenix, Arizona 85012

Terry Rozema, Town Manager
Town of Marana
Marana Municipal Complex
11555 W Civic Center Drive
Marana, AZ 85653

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Terry Rozema, Town Manager
Town of Marana
Marana Municipal Complex
11555 W. Civic Center Drive
Marana, AZ 85653

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

☒ Certified Mail ☐ Express Mail
☐ Registered ☒ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number *(Transfer from service l* 7008 0150 0001 1719 8800 -mtc

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

PLACE STICKER AT TOP OF ENVELOPE TO THE RIGHT OF THE RETURN ADDRESS, FOLD AT DOTTED LINE

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Terry Rozema, Town Manager
Town of Marana
Marana Municipal Complex
11555 W. Civic Center Drive
Marana, AZ 85653

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X [signature] ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* MATT Cordova — C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☑ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number *(Transfer from service l* 7008 0150 0001 1719 8800 -MHC

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

EXHIBIT AEPCO-8H

LETTER TO PIMA COUNTY RE DOCUMENTS FOR PUBLIC VIEWING

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibit.

May 6, 2022

Pima County Board of Supervisors
33 N. Stone Avenue, 11th Floor
Tucson, Arizona 85701

Saguaro – Marana 115/138 Kilovolt Transmission Line Application for a Certificate for Environmental Compatibility

To Whom It May Concern:

Arizona Electric Power Cooperative, Inc. (AEPCO) and Tucson Electric Power (TEP) are planning new electrical infrastructure to serve the Town of Marana, Arizona and the surrounding area. Pursuant to Arizona Revised Statutes (A.R.S.) 40-360, *et seq.*, AEPCO is seeking a Certificate of Environmental Compatibility (CEC) granting authority to construct the Saguaro to Marana 115/138kV-kilovolt (kV) Transmission Line Project (Project). The proposed Project is a joint venture being undertaken by AEPCO and TEP.

The Project consists of the construction and operation of a new transmission line between the planned Trico Electric Cooperative Inc. (Trico) Adonis Substation and the existing AEPCO Marana Substation near Marana, Arizona. The Project consists of two separate transmission line configurations. One portion of the Project is a double-circuit 115/138kV transmission line to be jointly owned by AEPCO and TEP (the 115kV circuit will be owned and operated by AEPCO, and the 138kV circuit will be owned and operated by TEP); the other portion of the Project is a single-circuit transmission line owned and operated by AEPCO alone.

Part of the CEC process is submitting an application to help aid in the Line Siting Committee's determination if a CEC should be granted. Public involvement is an important factor in the Line Siting Committee's decision.

The Notice of Hearing issued by the Chairman of the Line Siting Committee specifically identifies the Pima County Board of Supervisors as a location to make the Application and hearing transcripts available for inspection. Per the Chairman's request, AEPCO is requesting this binder be placed in a public viewing area so that those in Pima County, who want to, are able to view the complete application. Per the Notice of Hearing, AEPCO will also provide copies of hearing transcripts for viewing, as those become available.

If you have any questions regarding this request, please contact me, Kevin Barnes, at (520) 586-5457 or at kbarnes@azgt.coop.

Sincerely,

Kevin Barnes
Environmental Permitting and Land Services Manager

Incl:

- Saguaro to Marana 115/138 Kilovolt Transmission Line Application for a Certificate for Environmental Compatibility (binder)
- Pre-filing conference transcripts
- Amended Notice of Hearing Docket No. L-00000A-22-0102-00203 Case No. 203

EXHIBIT AEPCO-8I

LETTER TO LIBRARY RE DOCUMENTS FOR PUBLIC VIEWING

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibit.

May 6, 2022

Wheeler Taft Abbett Sr. Library
7800 N. Schisler Drive
Tucson, AZ 85743

Saguaro – Marana 115/138 Kilovolt Transmission Line Application for a Certificate for Environmental Compatibility

To Whom It May Concern:

Arizona Electric Power Cooperative, Inc. (AEPCO) and Tucson Electric Power (TEP) are planning new electrical infrastructure to serve the Town of Marana, Arizona and the surrounding area. Pursuant to Arizona Revised Statutes (A.R.S.) 40-360, *et seq.*, AEPCO is seeking a Certificate of Environmental Compatibility (CEC) granting authority to construct the Saguaro to Marana 115/138kV-kilovolt (kV) Transmission Line Project (Project). The proposed Project is a joint venture being undertaken by AEPCO and TEP.

The Project consists of the construction and operation of a new transmission line between the planned Trico Electric Cooperative Inc. (Trico) Adonis Substation and the existing AEPCO Marana Substation near Marana, Arizona. The Project consists of two separate transmission line configurations. One portion of the Project is a double-circuit 115/138kV transmission line to be jointly owned by AEPCO and TEP (the 115kV circuit will be owned and operated by AEPCO, and the 138kV circuit will be owned and operated by TEP); the other portion of the Project is a single-circuit transmission line owned and operated by AEPCO alone.

Part of the CEC process is submitting an application to help aid in the Line Siting Committee's determination if a CEC should be granted. Public involvement is an important factor in the Line Siting Committee's decision.

The Notice of Hearing issued by the Chairman of the Line Siting Committee specifically identifies the Pima County Board of Supervisors as a location to make the Application and hearing transcripts available for inspection. Per the Chairman's request, AEPCO is requesting this binder be placed in a public viewing area so that those in Pima County, who want to, are able to view the complete application. Per the Notice of Hearing, AEPCO will also provide copies of hearing transcripts for viewing, as those become available.

If you have any questions regarding this request, please contact me, Kevin Barnes, at (520) 586-5457 or at kbarnes@azgt.coop.

Sincerely,

Kevin Barnes
Environmental Permitting and Land Services Manager

Incl:

- Saguaro to Marana 115/138 Kilovolt Transmission Line Application for a Certificate for Environmental Compatibility (binder)
- Pre-filing conference transcripts
- Amended Notice of Hearing Docket No. L-00000A-22-0102-00203 Case No. 203

EXHIBIT AEPCO-8J

LETTER TO MUNICIPAL COMPLEX RE DOCUMENTS FOR PUBLIC VIEWING

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibit.

May 6, 2022

Marana Municipal Complex
11555 W. Civic Center Dr.
Marana, AZ 85653

Saguaro – Marana 115/138 Kilovolt Transmission Line Application for a Certificate for Environmental Compatibility

To Whom It May Concern:

Arizona Electric Power Cooperative, Inc. (AEPCO) and Tucson Electric Power (TEP) are planning new electrical infrastructure to serve the Town of Marana, Arizona and the surrounding area. Pursuant to Arizona Revised Statutes (A.R.S.) 40-360, *et seq.*, AEPCO is seeking a Certificate of Environmental Compatibility (CEC) granting authority to construct the Saguaro to Marana 115/138kV-kilovolt (kV) Transmission Line Project (Project). The proposed Project is a joint venture being undertaken by AEPCO and TEP.

The Project consists of the construction and operation of a new transmission line between the planned Trico Electric Cooperative Inc. (Trico) Adonis Substation and the existing AEPCO Marana Substation near Marana, Arizona. The Project consists of two separate transmission line configurations. One portion of the Project is a double-circuit 115/138kV transmission line to be jointly owned by AEPCO and TEP (the 115kV circuit will be owned and operated by AEPCO, and the 138kV circuit will be owned and operated by TEP); the other portion of the Project is a single-circuit transmission line owned and operated by AEPCO alone.

Part of the CEC process is submitting an application to help aid in the Line Siting Committee's determination if a CEC should be granted. Public involvement is an important factor in the Line Siting Committee's decision.

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If you have any questions regarding this request, please contact me, Kevin Barnes, at (520) 586-5457 or at kbarnes@azgt.coop.

Sincerely,

Kevin Barnes
Environmental Permitting and Land Services Manager

Incl:

- Saguaro to Marana 115/138 Kilovolt Transmission Line Application for a Certificate for Environmental Compatibility (binder)
- Pre-filing conference transcripts
- Amended Notice of Hearing Docket No. L-00000A-22-0102-00203 Case No. 203

EXHIBIT AEPCO-8K

UPDATED HEARING SIGNS

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

NOTICE OF PUBLIC HEARING

SAGUARO TO MARANA 115/138 kV TRANSMISSION LINE

Arizona Electric Power Cooperative, Inc. (AEPCO) invites the public to participate at the hearing for the above project before the Arizona Power Plant and Transmission Line Sitting Committee.

Date	Start Time	Location
June 6, 2022	1:00 p.m.	Northwest Fire Department Training Facility 5125 W Camino De Fuego Tucson, AZ 85743
June 7-10, 2022 (as needed)	9:00 a.m.	Northwest Fire Department Training Facility 5125 W Camino De Fuego Tucson, AZ 85743
Revision to the hearing or touring schedule and additional hearing days will be noticed on the Arizona Corporation Commission's website, available at: https://www.azcc.gov/arizona-power-plant/meeting-schedule		

Public Comment will be taken at the hearing as follows:
5:30 p.m. on June 6, 2022
at Northwest Fire Department Training Facility
5125 W Camino De Fuego
Tucson, AZ 85743

The Project will involve construction of approximately four miles of new double-circuit 115/138 kV transmission line from the proposed Adonis Substation to Wentz and Marana Road and four miles of new 115 kV transmission line from Wentz and Marana Road to the existing Marana Substation.

For more information, visit the following website:
https://azgtsaguaromarana.com/
Email us at: saguaromarana@azgt.coop
or call (520) 586-5252

Arizona Corporation Commission Docket No. L-00000A-22-0102-002203 (Case No. 203)


STOP
NOTICE OF PUBLIC HEARIN
SAGUARO TO MARANA 115/138 kV TRANSMISSION LINE
Arizona Electric Power Cooperative, Inc. (AEPCO) invites the public to participate at the hearing for the above project before the Arizona Power Plant and Transmission Line Siting Committee.
Start Time
Location
1:00 p.m.
Northwest Fire Department Training Facility
5125 W Camino De Fuego
Tucson, AZ 85743
9:00 a.m.
Northwest Fire Department Training Facility
5125 W Camino De Fuego
Tucson, AZ 85743
Public Comment will be taken at the hearing as follows:
Adonis Substation


NOTICE OF PUBLIC HEARING
SAGUARO TO MARANA 115/138 kV TRANSMISSION LINE
Arizona Electric Power Cooperative, Inc. (AEPCO) invites the public to participate at the hearing for the above project before the Arizona Power Plant and Transmission Line Siting Committee.
Date
Start Time
Location
June 6, 2022
1:00 p.m.
Northwest Fire Department Training Facility
5125 W Camino De Fuego
Tucson, AZ 85743
June 7-10, 2022
(as needed)
9:00 a.m.
Northwest Fire Department Training Facility
5125 W Camino De Fuego
Tucson, AZ 85743
Revision to the hearing or touring schedule and additional hearing days will be noticed on the Arizona Corporation Commission's website, available at: https://www.azcc.gov/arizona-power-plant/meeting-schedule
Public Comment will be taken at the hearing as follows:
5:30 p.m. on June 6, 2022
at Northwest Fire Department Training Facility
5125 W Camino De Fuego
Tucson, AZ 85743
Substations
Proposed Route
W Kirby Hughes Rd
W Sagebrush Rd
W Moreno Rd
W Omar Rd
W Barnett Rd
W Moore Rd
W Trico Marana Rd
Marana Substation
N Trico Rd
N Luckett Rd
N Sandario Rd
N Silverbell Rd
The Project will involve construction of approximately four miles of new double-circuit 115/138 kV transmission line from the proposed Adonis Substation to Wentz and Marana road and four miles of new 115 kV transmission line from Wentz and Marana Road to the Marana Substation.
the following website:
-0102-002203 (Case No. 203)


NOTICE OF PUBLIC HEARING
SAGUARO TO MARANA 115/138 kV TRANSMISSION LINE
Arizona Electric Power Cooperative, Inc. (AEPCO) invites the public to participate at the hearing for the above project before the Arizona Power Plant and Transmission Line Sitting Committee.
Date
June 6, 2022
Start Time
1:00 p.m.
Location
Northwest Fire Department Training Facility
5125 W Camino De Fuego
Tucson, AZ 85743
June 7-10, 2022 (as needed)
9:00 a.m.
Northwest Fire Department Training Facility
5125 W Camino De Fuego
Tucson, AZ 85743
Revision to the hearing or touring schedule and additional hearing days will be noticed on the Arizona Corporation Commission's website, available at: https://www.azcc.gov/arizona-power-plant/meeting-schedule
Public Comment will be taken at the hearing as follows:
5:30 p.m. on June 6, 2022
at Northwest Fire Department Training Facility
5125 W Camino De Fuego
Tucson, AZ 85743
Substations
Proposed Route
W Kirby Hughes Rd
W Sagebrush Rd
W Trico Marana Rd
W Marana Rd
W Grier Rd
W Barnett Rd
W Moore Rd
N Luckett Rd
N Trico Rd
N Wentz Rd
N Sandario Rd
N Owl Head Ranch Rd
N Postvale Rd
Marana Substation
Adonis Substation
The Project will involve construction of approximately four miles of new double-circuit 115/138 kV transmission line from the proposed Adonis Substation to Wentz and Marana Road and four miles of new 115 kV transmission line from Wentz and Marana Road to the existing Marana Substation.
For more information, visit the following website:
https://aepcosaguaromarana.com/
Email us at: saguaromarana@azgt.coop
or call (520) 586-5252
Arizona Corporation Commission Docket No. L-00000A-22-0102-00220 3 (Case No. 203)

NOTICE OF PUBLIC HEARING

SAGUARO TO MARANA 115/138 kV TRANSMISSION LINE

Arizona Electric Power Cooperative, Inc. (AEPCO) invites the public to participate at the hearing for the above project before the Arizona Power Plant and Transmission Line Sitting Committee.

Date	Start Time	Location
June 6, 2022	1:00 p.m.	Northwest Fire Department Training Facility 5125 W Camino De Fuego Tucson, AZ 85743
June 7-10, 2022 (as needed)	9:00 a.m.	Northwest Fire Department Training Facility 5125 W Camino De Fuego Tucson, AZ 85743
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5:30 p.m. on June 6, 2022
at Northwest Fire Department Training Facility
5125 W Camino De Fuego
Tucson, AZ 85743

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For more information, visit the following website:
https://azgtsaguaromarana.com/
Email us at: saguaromarana@azgt.coop
or call (520) 586-5252

Arizona Corporation Commission Docket No. L-00000A-22-0102-002203 (Case No. 203)

EXHIBIT AEPCO-9

RECEIPT OF FILING FEE

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibit.

0000206649

ORIGINAL

ARIZONA CORPORATION COMM

RECEIPT DATE 4-28-22 No: 521559

$1000

RECEIVED FROM Osborn Maledon

One thousand & no/100 DOLLARS

FOR RENT

FOR 4ne Siting Case 00203

ACCOUNT		CASH	
PAYMENT	112977	X CHECK	FROM TO
BAL. DUE		MONEY ORDER	
		CREDIT CARD	BY Carla

L-00000A-22-0102-00203

Arizona Corporation Commission
DOCKETED

APR 28 2022

DOCKETED BY

RECEIVED
2022 APR 28 P 1:05
AZ CORP COMMISSION
DOCKET CONTROL

EXHIBIT AEPCO-10

VIRTUAL TOUR

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Applicant Arizona Electric Power Cooperative, Inc. provides the Virtual Tour to Arizona Power Plant and Line Siting Committee Members via thumb drive.

To view the virtual tour, please see the Project website at: https://azgtsaguaromarana.com/tour/.

EXHIBIT AEPCO-11

TOUR ITINERARY/SCRIPT/PROTOCOL

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibit.

Saguaro – Marana 115/138 kV Transmission Line Project

Route Tour Itinerary

June 2022

Siting Committee Pick Up Location

- Members of the Siting Committee participating in the route tour will be picked up using a passenger van at the hearing venue location at Northwest Fire Department Training Facility 5125 W Camino de Fuego, Tucson, AZ 85743.
- The attached Figure 1 – Proposed Route map illustrates the location of the route traveling from the Planned Adonis Substation (east of Interstate 10) along Owl Head Ranch Road towards the west to the existing Marana Substation (west of Interstate 10) adjacent to North Trico Road.

Route Stop Location #1

- The tour will start at the Planned Adonis Substation, located at the intersection of Owl Head Ranch Road and the 115/138 kV transmission line corridor. The transmission line corridor is approximately 1 mile northeast of the CAP Canal.
- From this point, the tour will continue southwest along Owl Head Ranch Road.

Route Stop Location #2

- The second stop will be along Owl Head Ranch Road approximately ¼ mile southwest of the Planned Adonis Substation.
- From this point, the tour will continue southwest along Owl Head Ranch Road.

Route Stop Location #3

- The third stop will be at the CAP Trail, which crosses over Owl Head Ranch Road approximately ¼ mile east of the CAP Canal.
- From this point, the tour will continue southwest along Owl Head Ranch Road.

Route Stop Location #4

- The fourth stop will be at the CAP Canal, which crosses under a bridge along West Cochise Canyon Trail.
- From this point, the tour will continue southwest along West Cochise Canyon Trail.

Route Stop Location #5

- The fifth stop will be along the northern property boundary of the San Lucas Community. Approximately 300 feet west of the intersection of West Cochise Canyon Trail with the CAP Canal.
- From this point, the tour will continue west along West Cochise Canyon Trail crossing underneath Interstate 10. The tour will then turn north along the frontage road towards the intersection of West Sagebrush Road.

Route Stop Location #6

- The sixth stop will be at the crossing of Interstate 10 and the UPRR tracks. The location is along the west side of Interstate 10 frontage road where it intersects with West Sagebrush Road.
- From this point, the tour will continue west along West Sagebrush Road approximately ½ mile, then turn south along North Sanders Road for ½ mile to the intersection of West Marana Road.

Route Stop Location #7

- The seventh stop will be at the North Sanders Road and West Marana Road.
- From this point, the tour will continue west along West Marana Road approximately ½ mile.

Route Stop Location #8

- The eighth stop will be near the TEP Substation Siting Area located approximately at the ½ section line (midpoint) between North Sanders Road and North Wentz Road.
- From this point, the tour will continue west along West Marana Road approximately 1 mile.

Route Stop Location #9

- The ninth stop will be near along West Marana Road approximately at the ½ section line (midpoint) between North Wentz Road and North Luckett Road.
- From this point, the tour will continue west along West Marana Road approximately 1 mile to the bridge that crossing over top of the Santa Cruz River.

Route Stop Location #10

- The tenth stop will be bridge crossing over top of the Santa Cruz Rive along West Marana Road.
- From this point, the tour will continue west along West Marana Road approximately 1 mile.

Route Stop Location #11

- The eleventh stop will be along West Trico Marana Road approximately ½ mile east of North Trico Road.
- From this point, the tour will continue west along West Trico Marana Road approximately ½ mile. The tour will then turn south along North Trico Marana Road terminating at the Marana Substation.

Route Stop Location #12

- The twelfth stop will at the Marana Substation along North Trico Road approximately 500 feet south of the intersection of West Trico Marana Road.
- The route tour will conclude here and return to the hearing venue.

SAGUARO SUBSTATION
7 MILES NORTHWEST

Pinal County
Pima County

Central Arizona Project Canal

N Luckett Rd

W Hardin Rd

Santa Cruz River

W Kirby Hughes Rd

N Trico Rd

W Treatment Plant Rd

Valles Ln

W Sagebrush Rd

W Marana Rd

Old Head Ranch Rd

W Cochie Canyon Trl

Adonis Substation

30

70

50

100

190

120

250

TEP Substation Siting Area

10

N Wentz Rd

W Grier Rd

N Sanders Rd

W Trico Marana Rd

320

Marana Substation

W Silverbell Rd

Nelson

Marana

Santa Cruz River

Reference Features
- Study Area
- Interstate
- Major Roads
- Local Road
- Railroad
- County Boundary
- Municipal Boundary

Utilities
- Existing Substation
- Proposed Substation
- Existing Pipeline

Existing Transmission Lines
- Existing 138kV Transmission Line
- Existing 115kV Transmission Line
- Existing 24.9kV Distribution Line

Proposed Route
- Proposed Route Single Circuit 115kV
- Proposed Route Double Circuit 115/138kV
- Route Link Node
- 100 Route Link Number

NORTH

4,000 2,000 0 4,000

Scale in Feet

1 inch = 4,000 feet When Plotted at 11x17 1:48,000

Arizona G&T Cooperatives

Touchstone Energy® Cooperatives

BURNS McDONNELL

Figure 1
Proposed Route
Saguaro-Marana 115/138kV Transmission Line Project
Arizona G&T Cooperatives

Source: ESRI, Burns & McDonnell

Issued: 4/27/2022

Path: I:\ESP\Projects\AEPEC\Saguaro_Marana_115kV\Figures\CEC_Application\FIG_01_00_Preferred_Route_Double_Circuit.mxd sjensley 4/27/2022
Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

EXHIBIT AEPCO-12

TESTIMONY SUMMARY OF RANDALL SIMPSON

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibit.

Testimony Summary of Randall Simpson – Panel 2

Randall Simpson is a Senior Project Manager with Burns & McDonnell, Inc. He has approximately 30 years of experience with energy infrastructure development projects. Mr. Simpson has previously testified in several siting matters before this Committee.

Mr. Simpson holds a Bachelor of Landscape Architecture from North Dakota State University and a Bachelor of Environmental Design from North Dakota State University. He has considerable professional experience as a business director, project manager, and environmental planning consultant.

At the hearing, Mr. Simpson will describe the characteristics of the Project site and the siting process used to identify the Proposed Route. Mr. Simpson will also describe the environmental studies as they were considered in the Saguaro to Marana Project evaluations and their relation to the Project. Mr. Simpson will also provide an overview of relevant data collected from agencies and the public through the public engagement process. Additional details concerning Mr. Simpson's testimony are provided in the witness presentation slides, filed concurrently as AEPCO-13.

Mr. Simpson will also guide the virtual route tour of the Project. The virtual route tour will provide a flyover view of the Project site and the surrounding area.

EXHIBIT AEPCO-13

WITNESS PRESENTATION OF RANDALL SIMPSON

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibit.

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Saguaro to Marana 115/138kV Transmission Line Project

Randall L. Simpson
Project Manager
Burns & McDonnell, Inc.

Introduction

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Employment:

- Burns & McDonnell, Inc.
- Senior Project Manager

Education and Experience:

- Bachelor of Landscape Architecture, North Dakota State University
- Bachelor of Environmental Design, North Dakota State University
- Business Director and Senior Project Manager/Environmental Planning Consultant
- Approximately 30 Years of Experience in Energy Infrastructure Development
- Project Manager for and testified in Line Siting Case Nos. 116, 122, 127, 131, 187, and 198

Role and Responsibility

- Transmission Line Siting Study
- Environmental Data Collection and Analysis
- Public Engagement - Agency and Public Outreach
- Preparation of CEC Application and Exhibits

Testimony Overview

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Transmission Line Siting Study
- Environmental Data Collection and Analysis
  - Exhibits A, B, C, D, E, F, H, and I of CEC Application
- Virtual Route Tour

Environmental Studies

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Certificate of Environmental Compatibility Application
  - Siting Study (Exhibits B)
  - Land Use and Recreation (Exhibits A and F)
  - Biological Resources (Exhibits C and D)
  - Visual Resources (Exhibit E)
  - Cultural Resources (Exhibit E)
  - Existing Plans (Exhibit H)
  - Noise and Interference (Exhibit I)

Exhibit B – Siting Study

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Comprehensive evaluation process, integrating engineering and environmental studies along with agency and public input

- Four phases

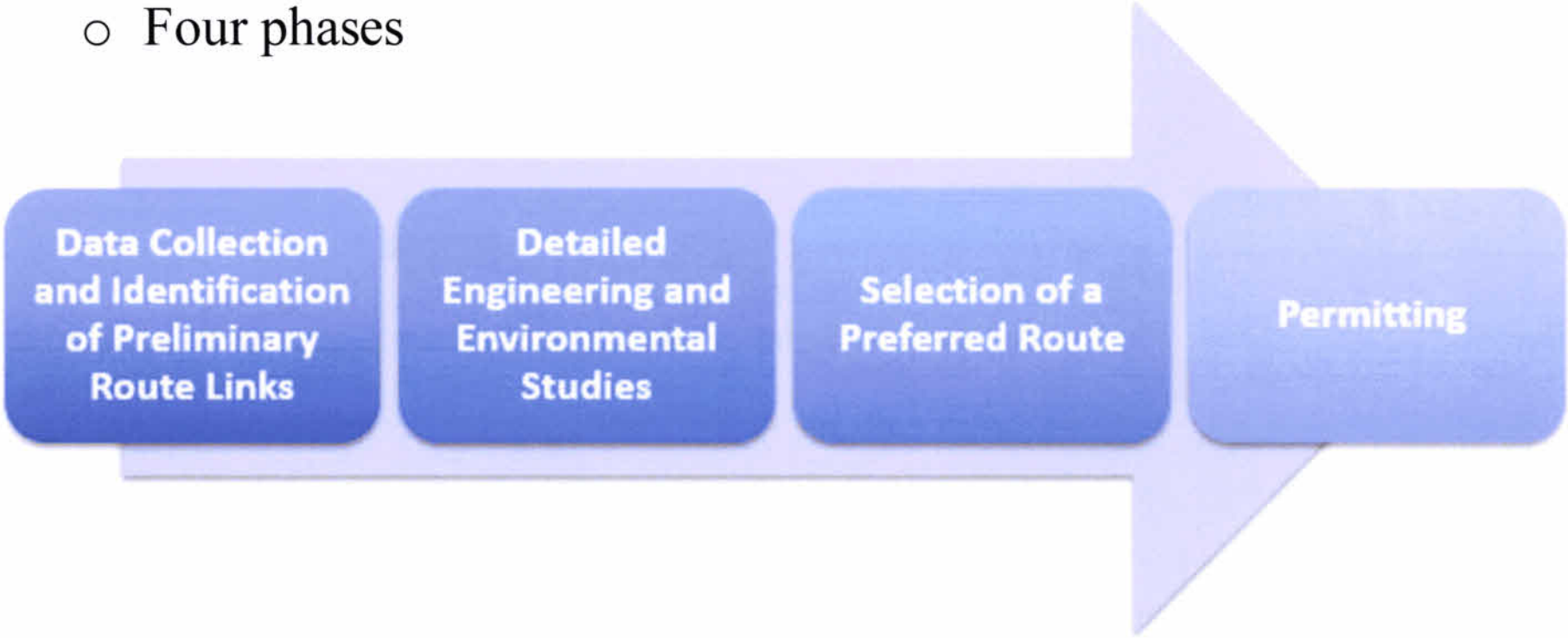


Exhibit B – Siting Study

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Key Considerations and Data Analysis

Engineering and Design

Right-of-Way

Existing and Planned Land Uses

Visual Resources

Recreation Resources

Biology and Conservation Areas

Cultural/Archaeology/Historical

Exhibit B – Siting Study

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Preliminary Route Link Segments

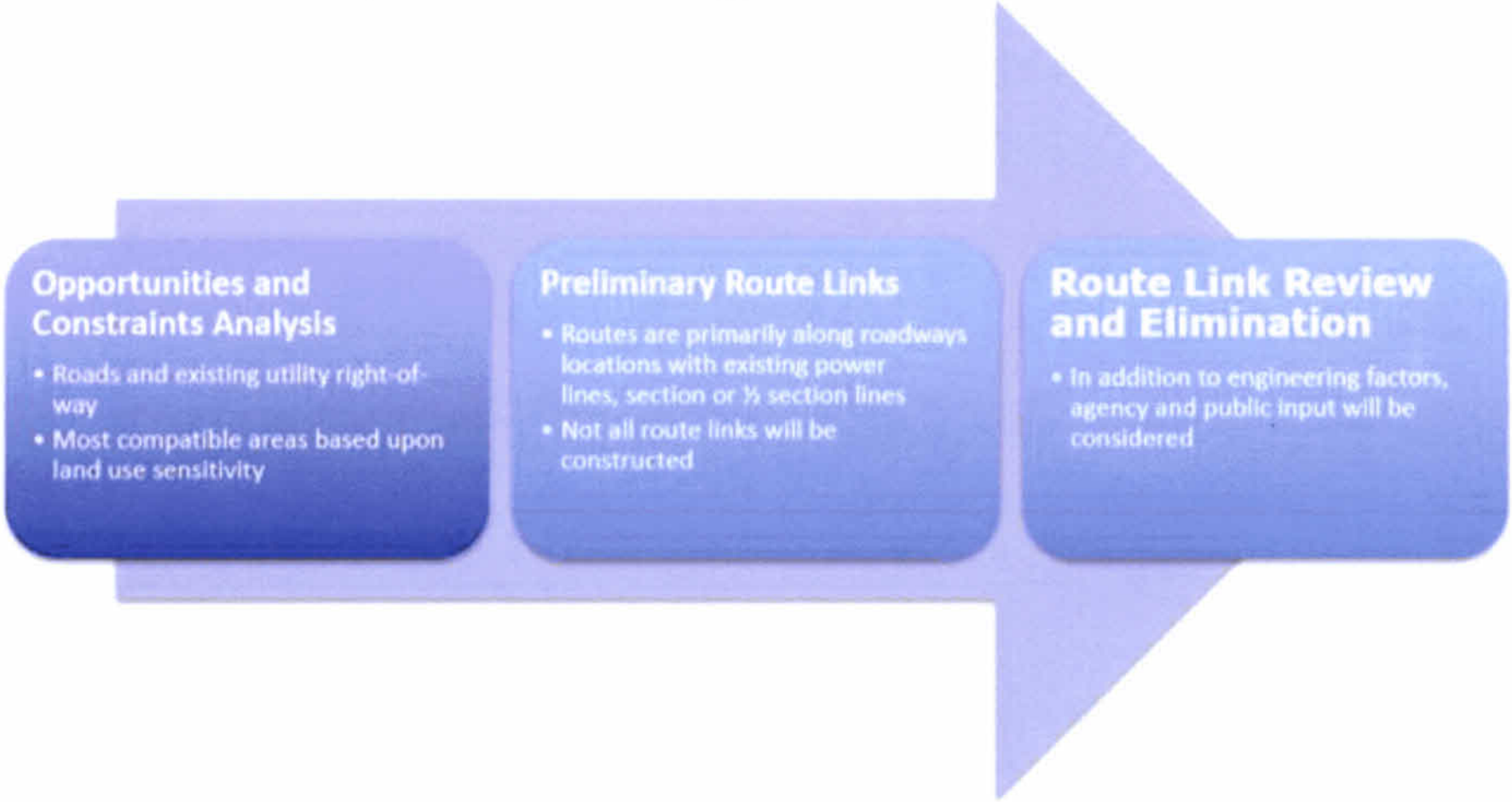


Exhibit B – Siting Study

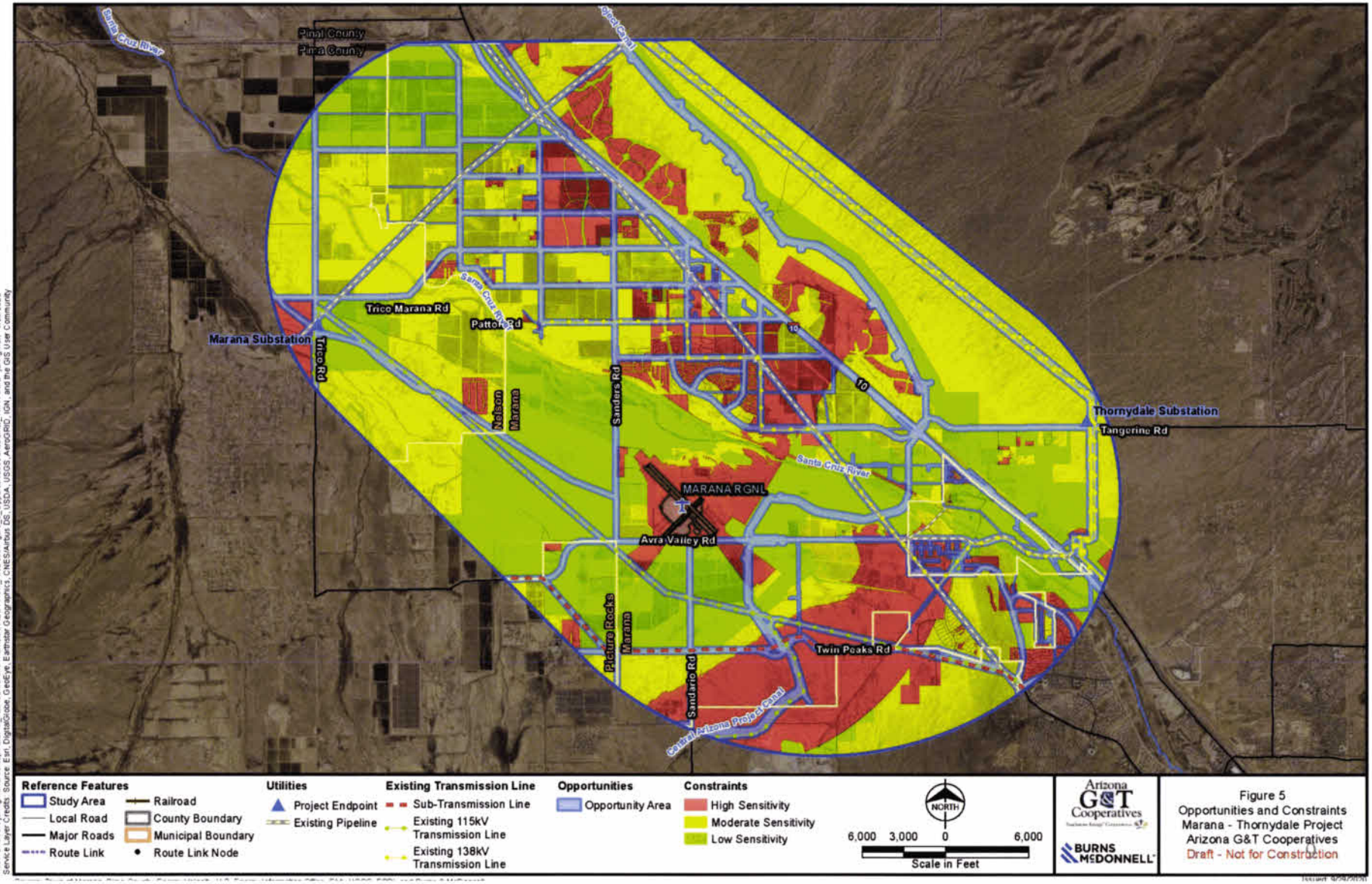
Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Phase I - Thornydale to Marana

- Study area encompasses approximately 79 square miles
- Land use, aviation, and conservation area data collected and analyzed
- Opportunities and constraints analysis identified 120 miles of preliminary route segments
- Four preliminary routes were identified to meet the project purpose and need

Arizona G&T Cooperatives

Touchstone Energy® Cooperatives



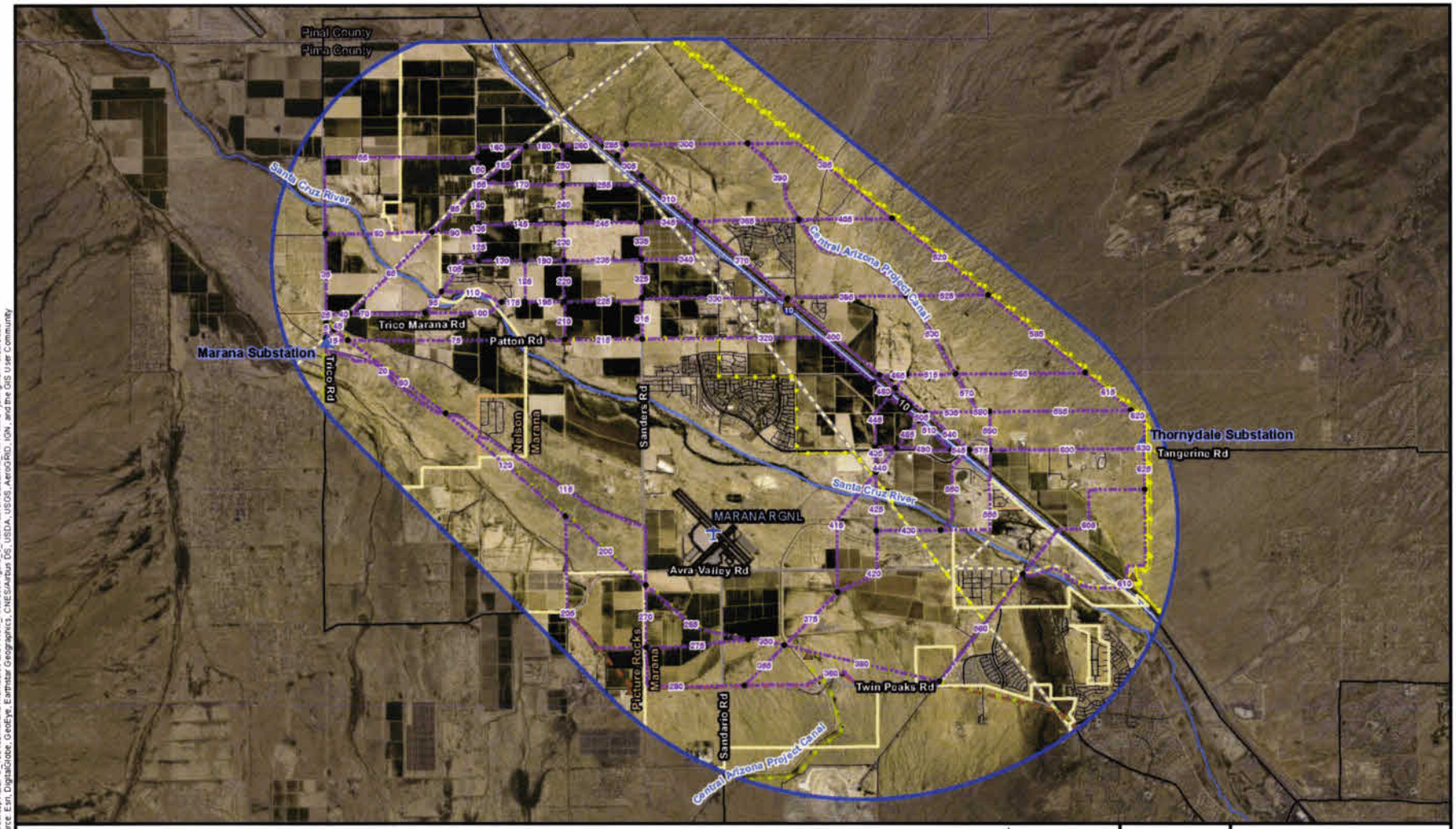
Arizona G&T Cooperatives

BURNS McDONNELL

Figure 5
Opportunities and Constraints
Marana - Thornydale Project
Arizona G&T Cooperatives
Draft - Not for Construction

Arizona G&T Cooperatives

Touchstone Energy® Cooperatives



Reference Features
- Study Area
- Local Road
- Major Roads
- Railroad
- County Boundary
- Municipal Boundary

Utilities
- Existing Substation
- Existing Pipeline

Existing Transmission Line
- Sub-Transmission Line
- Existing 115kV Transmission Line
- Existing 138kV Transmission Line

Alternative
- Route Link
- Route Link
- 555 Route Link Number

NORTH

6,000 3,000 0 6,000

Scale in Feet

Arizona G&T Cooperatives

BURNS McDONNELL

Figure 6
Alternative Route Links
Marana - Thornydale Project
Arizona G&T Cooperatives
Draft - Not for Construction

Issued: 9/29/2020

Path: C:\Users\johngman\Desktop\AZEPC_125432\Marana Thornydale\AZGTNew_ArcDocs\Figure_6_AlternativeRouteLinks_11x17.mxd johngman 9/29/2020
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Source: ESRI, Burns & McDonnell

Exhibit B – Siting Study

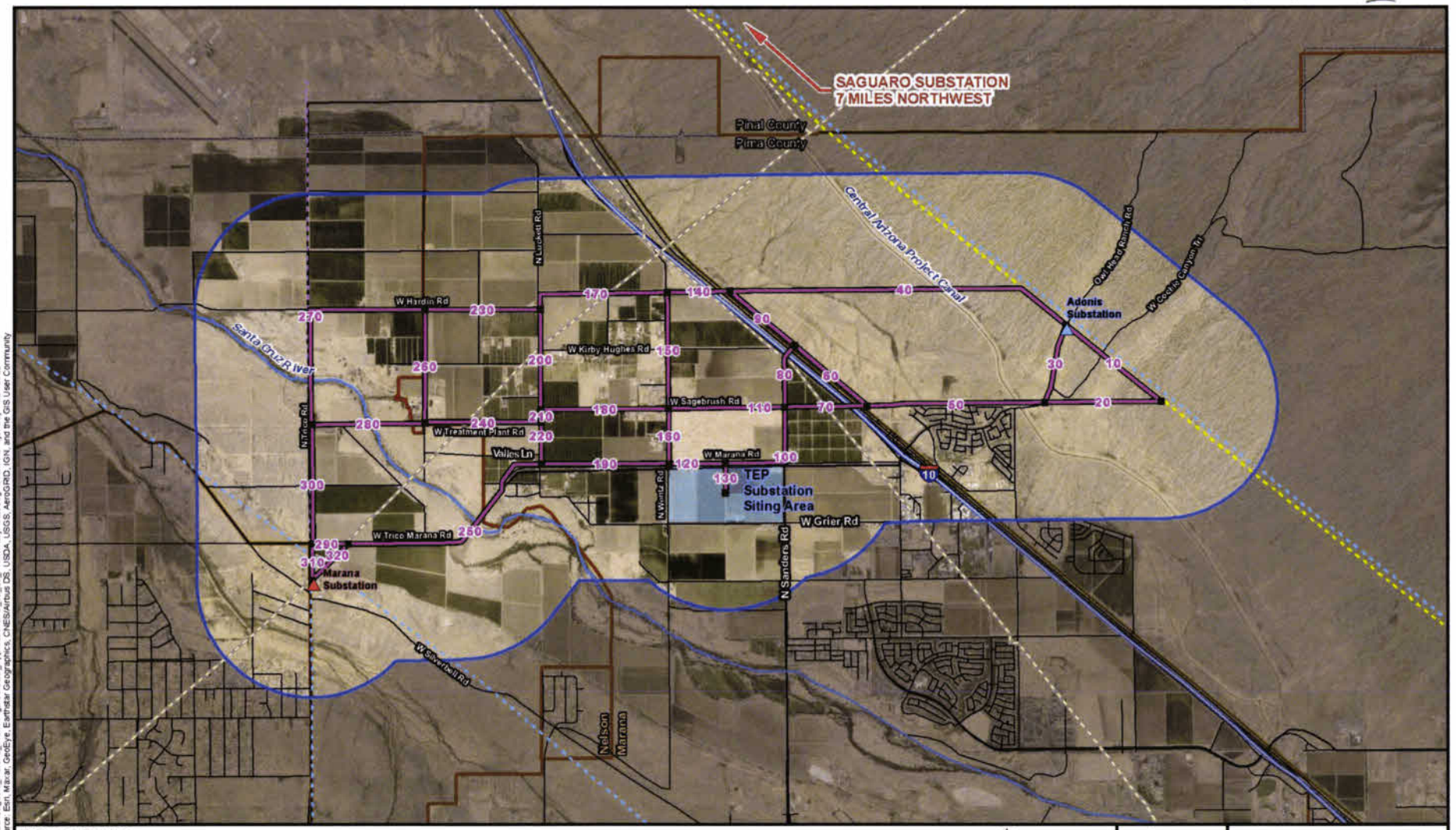
Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Phase II - Saguaro/Adonis to Marana

- Planned Adonis Substation and TEP Substation Siting Area identified as preferred interconnection points
- Revised study area encompasses approximately 43 square miles
- Detailed environmental data collection and analysis conducted for 30 miles of preliminary route segments
- Three revised preliminary routes were identified to meet the project purpose and need
- Proposed Route was identified as the preferred route due to environmental compatibility

Arizona G&T Cooperatives

Touchstone Energy® Cooperatives



Reference Features
- Study Area
- Interstate
- Major Roads
- Local Road
- Railroad
- County Boundary
- Municipal Boundary

Utilities
- Existing Substation
- Proposed Substation
- Existing Pipeline

Existing Transmission Lines
- Existing 138kV Transmission Line
- Existing 115kV Transmission Line
- Existing 24.9kV Distribution Line

Preliminary Route Segments
- Route Link
- Route Link Node
- 100 Route Link Number

4,000 2,000 0 4,000
Scale in Feet
1 inch = 4,000 feet When Plotted at 11x17 1:48,000

Arizona G&T Cooperatives

BURNS McDONNELL

Figure 2
Preliminary Route Segments
Saguaro - Marana 115/138kV Transmission Line Project
Arizona G&T Cooperatives

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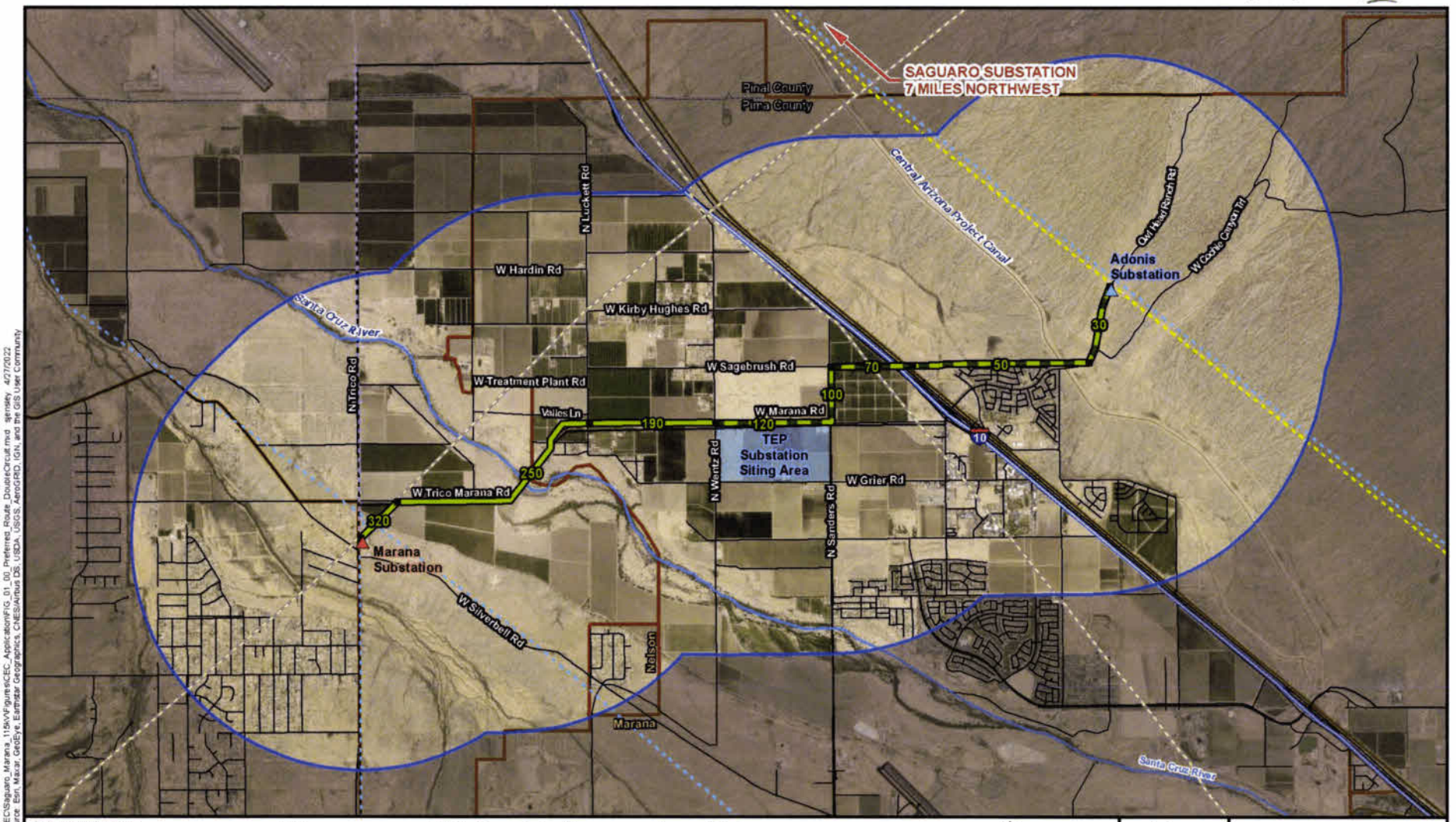
Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Arizona G&T Cooperatives

Touchstone Energy® Cooperatives



Reference Features
- Study Area
- Interstate
- Major Roads
- Local Road
- Railroad
- County Boundary
- Municipal Boundary

Utilities
- Existing Substation
- Proposed Substation
- Existing Pipeline

Existing Transmission Lines
- Existing 138kV Transmission Line
- Existing 115kV Transmission Line
- Existing 24.9kV Distribution Line

Proposed Route
- Proposed Route Single Circuit 115kV
- Proposed Route Double Circuit 115/138kV
- Route Link Node
- Route Link Number

4,000 2,000 0 4,000
Scale in Feet
1 inch = 4,000 feet
When Plotted at 11x17
1:48,000

Arizona G&T Cooperatives

BURNS McDONNELL

Figure 1
Proposed Route
Saguaro-Marana 115/138kV Transmission Line Project
Arizona G&T Cooperatives

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Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Exhibit A – Land Use

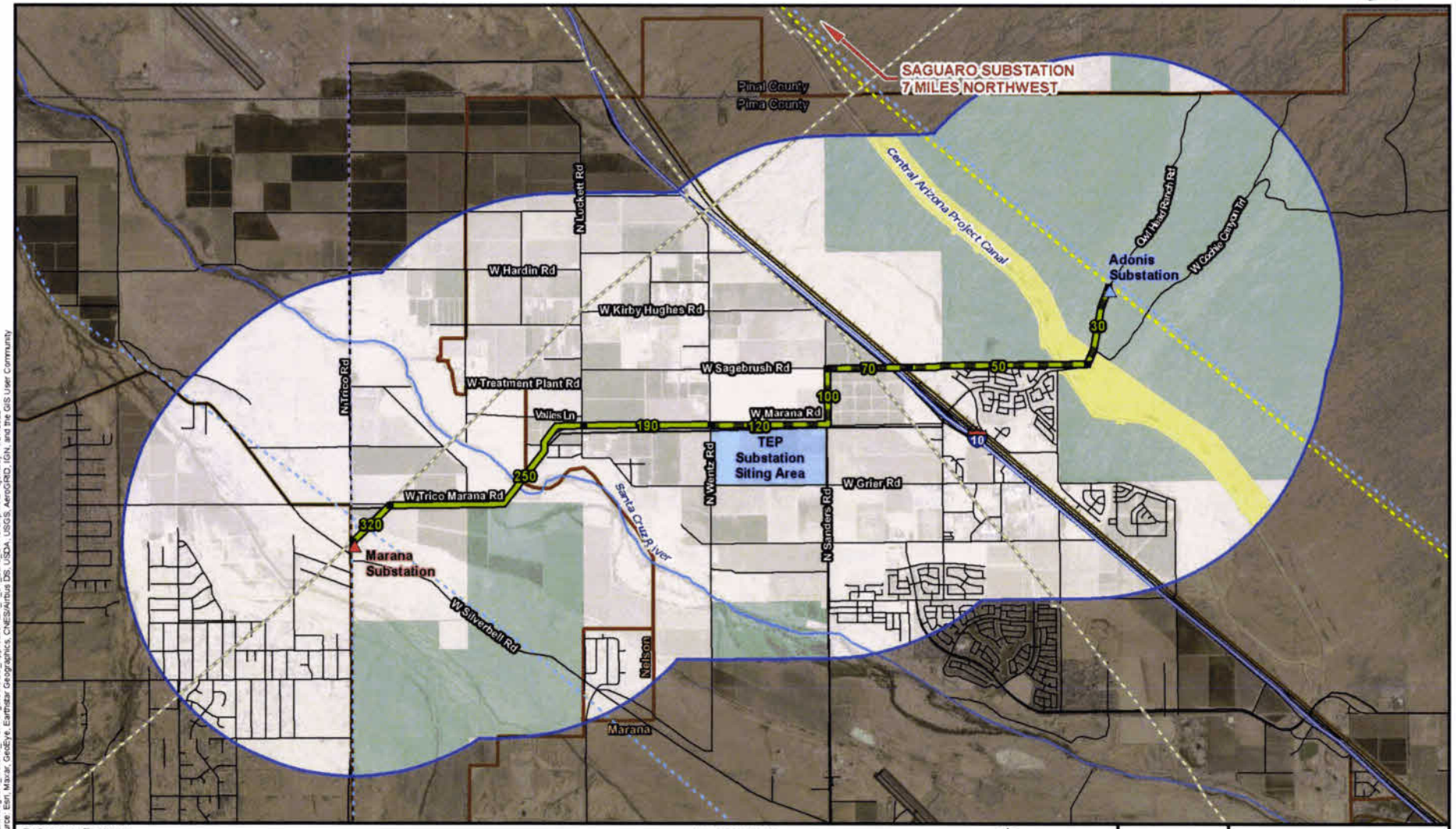
Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Data Collection and Analysis
  - Proposed Route
    - Land Ownership
      - Private land (67.9%)
      - Federal (5.1%)
      - State (23.0%)
      - Municipal (4.0%)

- Jurisdictions of Pima County and Town of Marana
  - Pima Prospers Comprehensive Plan (2015)
  - Make Marana 2040 General Plan (2019)

Arizona G&T Cooperatives

Touchstone Energy® Cooperatives



Reference Features
- Study Area
- Interstate
- Major Roads
- Local Road
- Railroad
- County Boundary
- Municipal Boundary

Utilities
- Existing Substation
- Proposed Substation
- Existing Pipeline

Existing Transmission Lines
- Existing 138kV Transmission Line
- Existing 115kV Transmission Line
- Existing 24.9kV Distribution Line

Land Ownership
- Bureau of Reclamation
- State
- Private

Proposed Route
- Proposed Route Single Circuit 115kV
- Proposed Route Double Circuit 115/138kV
- Route Link Node
- 100 Route Link Number

NORTH

4,000 2,000 0 4,000

Scale in Feet

1 inch = 4,000 feet When Plotted at 11x17 1:48,000

Arizona G&T Cooperatives

BURNS McDONNELL

Exhibit A-1
Land Ownership
Saguaro - Marana 115/138kV Transmission Line Project
Arizona G&T Cooperatives

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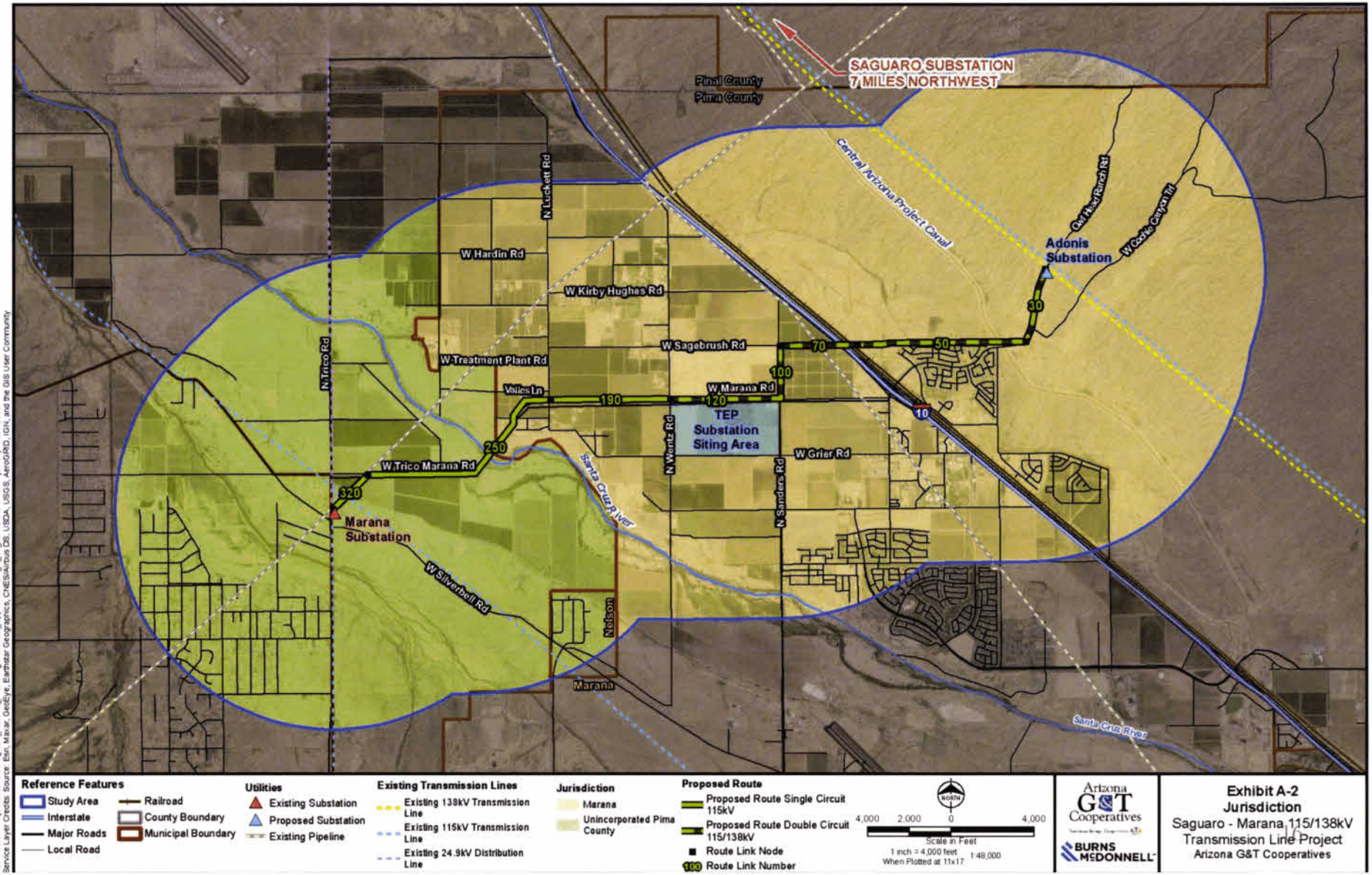
Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Arizona G&T Cooperatives

Touchstone Energy® Cooperatives



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Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Arizona G&T Cooperatives

BURNS McDONNELL

Exhibit A-2
Jurisdiction
Saguaro - Marana 115/138kV Transmission Line Project
Arizona G&T Cooperatives

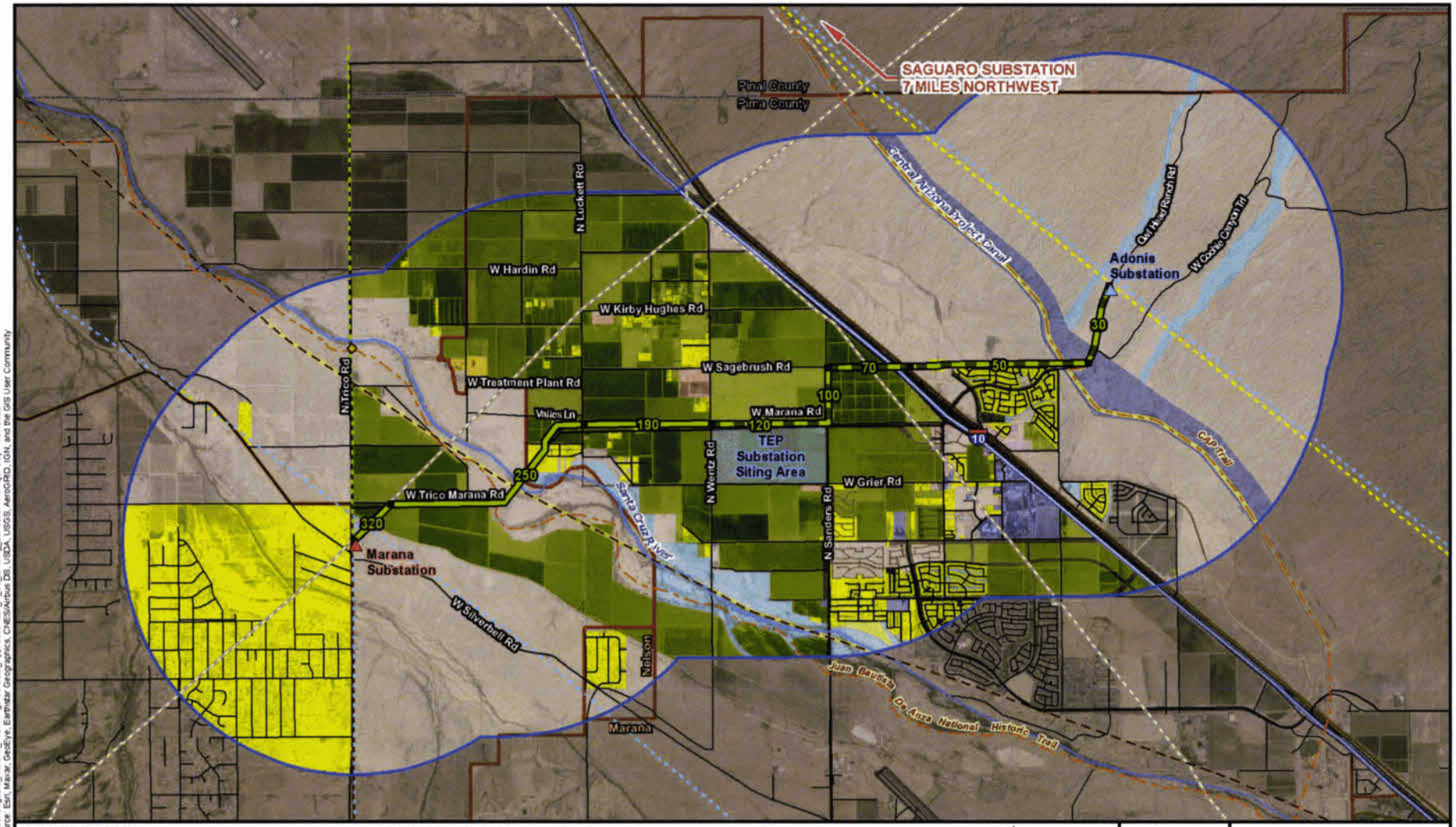
Exhibit A – Land Use

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Data Collection and Analysis
  - Existing Land Use
    - Residential
    - San Lucas Community
    - Rural homes
  - Agricultural west of Interstate 10
  - Commercial near intersection of Interstate 10 and West Marana Road
  - Recreation along CAP Canal and Santa Cruz River
  - Undeveloped desert uplands east of Interstate 10 and along Santa Cruz River
  - Major transportation corridors Interstate 10, UPRR, West Marana/Trico Marana Road

Arizona G&T Cooperatives

Touchstone Energy® Cooperatives



Reference Features
- Study Area
- Interstate
- Major Roads
- Local Road
- Trail
- Trailhead
- Railroad
- County Boundary
- Municipal Boundary

Utilities
- Existing Substation
- Proposed Substation
- Existing Pipeline

Existing Transmission Lines
- Existing 138kV Transmission Line
- Existing 115kV Transmission Line
- Existing 24.9kV Distribution Line

Existing Land Use
- Agriculture
- Commercial
- Industrial
- Open Space/Park
- Public/ Institutional
- Residential
- River/Wash
- Transportation
- Utility
- Vacant/ Undeveloped

Proposed Route
- Proposed Route Single Circuit 115kV
- Proposed Route Double Circuit 115/138kV
- Route Link Node
- 100 Route Link Number

NORTH

4,000 2,000 0 4,000

Scale in Feet

1 inch = 4,000 feet 1:48,000

When Plotted at 11x17

Arizona G&T Cooperatives

BURNS McDONNELL

Exhibit A-3
Existing Land Use
Saguaro - Marana 115/138kV Transmission Line Project
Arizona G&T Cooperatives

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Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

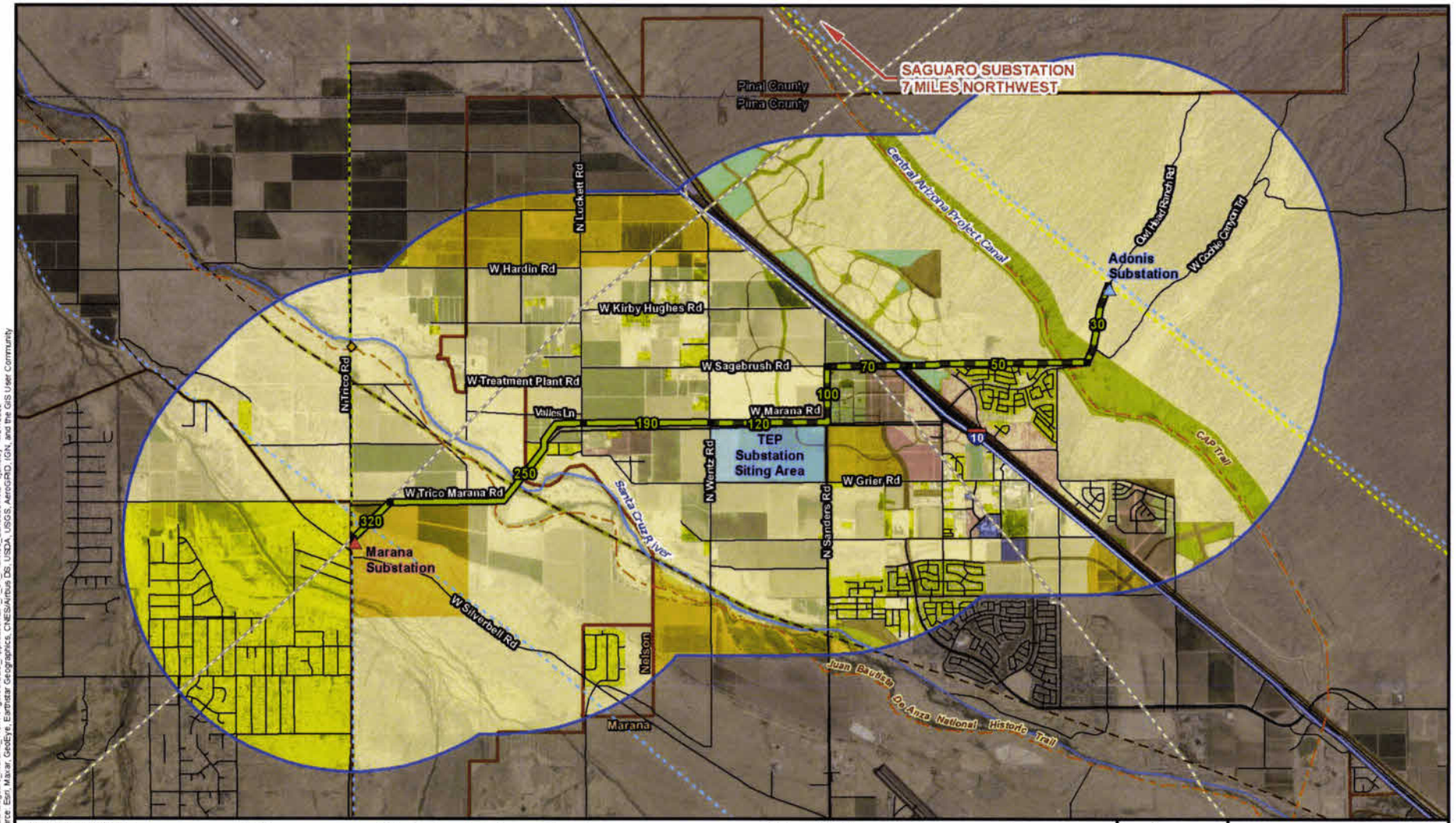
Exhibit A – Land Use

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Data Collection and Analysis
  - Future Land Use
    - Predominantly residential
      - Sanders Grove and Villages at Tortolita are approved master planned communities in Town of Marana
      - Commercial/employment/mixed use along Interstate 10 corridor
    - Recreation corridor along CAP Canal

Arizona G&T Cooperatives

Touchstone Energy® Cooperatives



Reference Features
- Study Area
- Interstate
- Major Roads
- Local Road
- Trail
- Trailhead
- Railroad
- County Boundary
- Municipal Boundary

Utilities
- Existing Substation
- Proposed Substation
- Existing Pipeline

Existing Transmission Lines
- Existing 138kV Transmission Line
- Existing 115kV Transmission Line
- Existing 24.9kV Distribution Line

Planned Land Use
- Commercial
- Employment
- Industrial
- Institutional
- Master Planned Area
- Mixed-Use
- Open Space/Park
- Residential (Existing)
- Residential (Planned)
- Transportation

Proposed Route
- Proposed Route Single Circuit 115kV
- Proposed Route Double Circuit 115/138kV
- Route Link Node
- 100 Route Link Number

NORTH

4,000 2,000 0 4,000

Scale in Feet

1 inch = 4,000 feet When Plotted at 11x17 1:48,000

Arizona G&T Cooperatives

BURNS McDONNELL

Exhibit A-4
Planned Land Use
Saguaro - Marana 115/138kV Transmission Line Project
Arizona G&T Cooperatives

Exhibit A – Land Use

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Proposed Route Assessment and Impacts
  - Majority of impacts would be low to moderate and do not adversely impact existing or planned land uses
  - Moderate to high impacts would occur for few existing and planned land uses
    - Isolated rural residences and corrals where line may cross edges of properties
    - CAP Trail and Juan Bautista National Scenic Trail
  - Parallels existing road rights-of-way and utility lines, thus reducing level of impacts

Exhibit C – Biological Wealth
Exhibit D – Biological Resources

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Data Collection and Analysis
  - Biological Wealth & Resource identification sources
  - Agency coordination: AGFD and USFWS online resources
  - AGFD project-specific letter
  - Species and habitat resources identified
  - Species, species groups, and rich/valuable habitats
  - Project Area site conditions and habitat availability
  - Biological expertise and literature review
  - Biological field visit and habitat evaluation

Exhibit C – Biological Wealth
Exhibit D – Biological Resources

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Proposed Route Assessment and Impacts
  - Habitat Evaluation
    - 77.5% agricultural field & other highly modified lands
    - 12.5% relatively intact desert upland
    - 10% Santa Cruz River floodplain
  - 95% of proposed route parallels existing roads (e.g., improved or unimproved)
  - Environmental Protection Measures
    - Raptors/transmission lines
    - Migratory birds
    - Burrowing owl
    - Sonoran desert tortoise
    - Wildlife travel corridor
    - Vegetation
  - Project causes minimal habitat impacts and no measurable decline in abundance of any native wildlife

Exhibit E – Scenic Areas and Visual Resources

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Data Collection and Analysis
  - Existing Scenery
    - Class A landscapes along Santa Cruz River
    - Class B landscapes
      - desert uplands
      - agricultural land
    - Class C landscapes
      - desert scrub lands
      - fallow agricultural lands
    - Developed landscapes
      - residential
      - commercial
      - industrial
      - utility facilities

Exhibit E – Scenic Areas and Visual Resources

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Class A – Santa Cruz River

Class B – Sonoran Desert Uplands

Class B – Agricultural Land

Developed – Utilities/Marana Substation

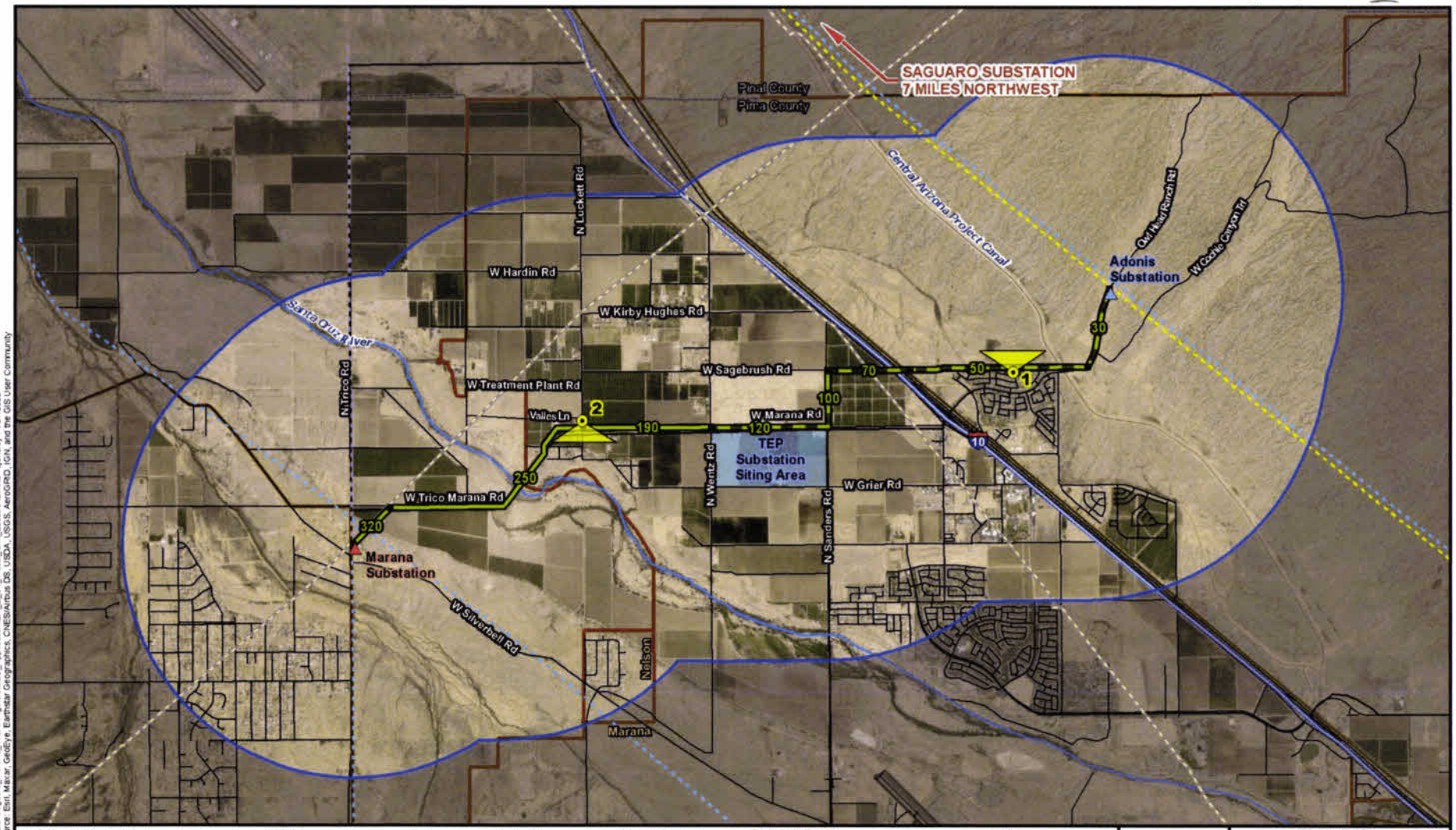
Exhibit E – Scenic Areas and Visual Resources

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Data Collection and Analysis
  - Viewpoints and Visibility
    - Residential
      - San Lucas Community
      - rural homes along West Marana/Trico Marana Road
    - Recreation
    - CAP Trail
      - Juan Bautista National Scenic Trail

Arizona G&T Cooperatives

Touchstone Energy® Cooperatives



Reference Features
- Study Area
- Interstate
- Major Roads
- Local Road
- Railroad
- County Boundary
- Municipal Boundary

Utilities
- Existing Substation
- Proposed Substation
- Existing Pipeline

Existing Transmission Lines
- Existing 138kV Transmission Line
- Existing 115kV Transmission Line
- Existing 24.9kV Distribution Line

Visual Simulation Locations
- Photo Location
- Visual Simulation View Direction

Proposed Route
- Proposed Route Single Circuit 115kV
- Proposed Route Double Circuit 115/138kV
- Route Link Node
- 100 Route Link Number

4,000 2,000 0 4,000
Scale in Feet
1 inch = 4,000 feet 1:48,000
When Plotted at 11x17

Arizona G&T Cooperatives

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Exhibit E-1
Visual Simulation Viewpoint Locations
Saguaro - Marana 115/138kV Transmission Line Project
Arizona G&T Cooperatives

Visual Simulation #1 – San Lucas Community (open)

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Existing Condition

Proposed Condition – Open Viewing Condition

Visual Simulation #1 – San Lucas Community (screened)

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Existing Condition

Proposed Condition – Partially Screened Viewing Condition

Visual Simulation #2 – Rural Residences/West Marana Road

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Existing Condition

Proposed Condition – Open Viewing Condition

Exhibit E – Scenic Areas and Visual Resources

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Proposed Route Assessment and Impacts
  - Majority of impacts would be low to moderate and not adversely impact existing or planned scenic landscapes or high sensitivity views
  - Moderate to high impacts would occur to few existing residences
    - San Lucas Community
    - Isolated rural residences along West Marana/Trico Marana Road
  - Moderate to high impacts would occur to CAP Trail
  - Project parallels existing road rights-of-way and utility lines reducing level of impacts

Exhibit E – Historic Sites/Structures and Archaeological Sites

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Data Collection and Analysis
  - Class I records review for Study Area
    - State of Arizona's online database AZSITE
    - Archaeological Records Office, Arizona State Museum
    - Arizona Register of Historic Places
    - National Register of Historic Places
    - Historic GLO plats and USGS topographic quadrangles
  - Past Class III survey coverage and previously recorded historic properties identified
  - Assessed potential mitigations for impacts to historic properties

Exhibit E – Historic Sites/Structures and Archaeological Sites

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Proposed Route Assessment and Impacts
  - 8 historic properties have potential to be impacted
    - The South Gila Ditch, the Southern Pacific Railroad Mainline - Southern Route, Historic SR 84, and Cortaro Farms Canal
    - AZ AA:12:466(ASM)
    - AZ AA:12:646(ASM)
    - AZ AA:12:1071(ASM)
    - AZ AA:11:12(ASM)
  - Impacts to be mitigated through avoidance (spanning properties, adjustments to access routes) and archaeological construction monitoring
  - Impacts on alternate routes within the Study Area were considered higher impact as required traversing the Marana Platform Mound Community

Exhibit F – Recreation Purposes and Aspects

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Data Collection and Analysis
  - Developed recreation facilities are not prevalent near the Proposed Route; there are small neighborhood parks/open space within the San Lucas Community
  - Proposed Route crosses the CAP Trail west of the CAP Canal and future Juan Bautista National Scenic Trail along the Santa Cruz River

Exhibit F – Recreation Purposes and Aspects

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Proposed Route Assessment and Impacts
  - No recreation facilities will be displaced or adversely impacted
  - AEPCO would consider future opportunities to accommodate recreational facilities within right-of-way, with consideration for safety, operations, and maintenance requirements
  - Proposed route is compatible with existing and planned recreational facilities

Exhibit H – Existing Plans

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Data Collection and Analysis
  - Jurisdictions of Pima County and Town of Marana
    - Pima Prospers Comprehensive Plan (2015)
    - Make Marana 2040 General Plan (2019)
  - Briefings and correspondence with agencies to identify plan approved or conceptual developments
    - Pima County
    - Town of Marana
    - State Land Department
    - ADOT

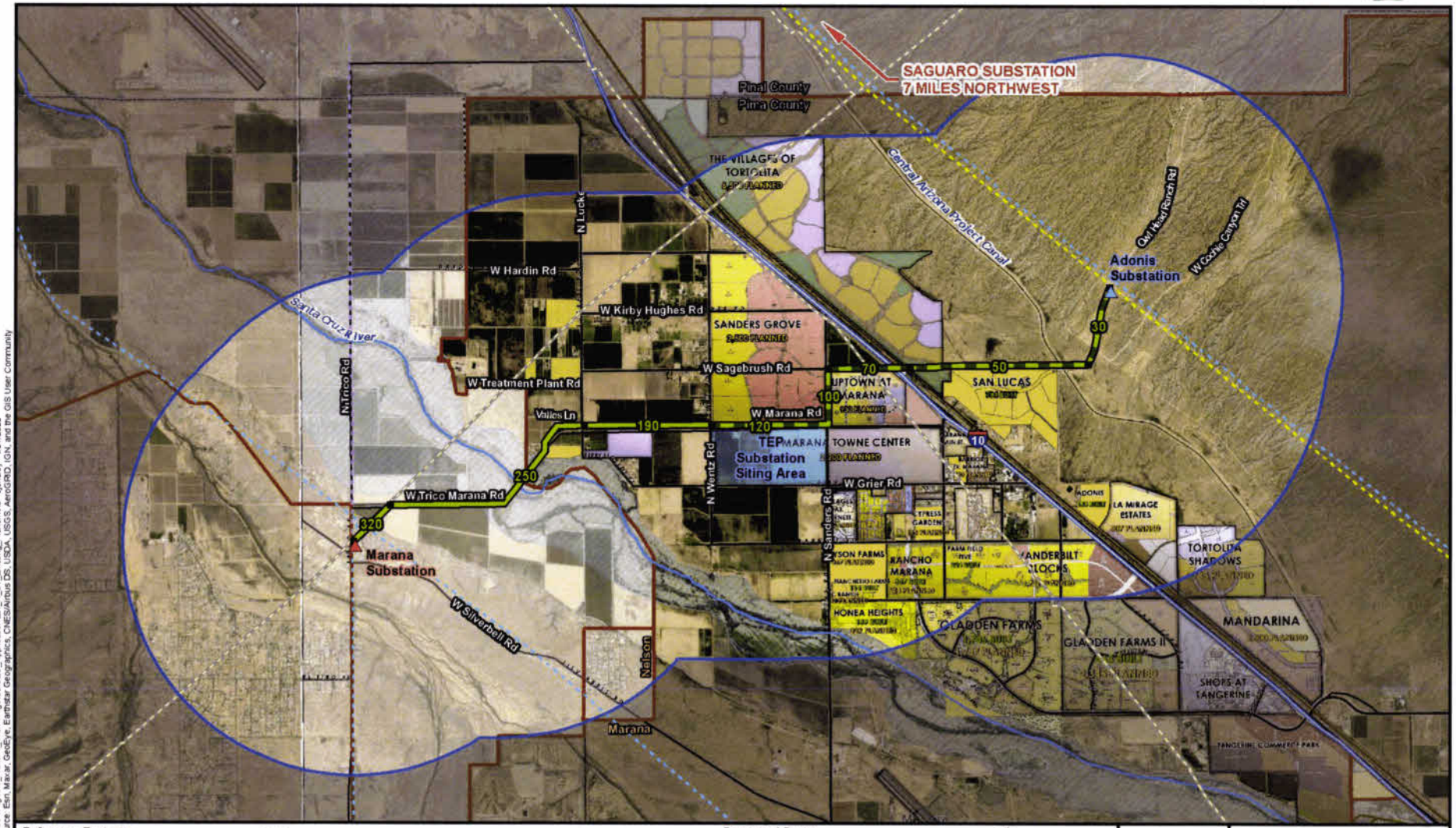
Exhibit H – Existing Plans

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Proposed Route Assessment and Impacts
  - No adverse impacts will occur to the plan approved or conceptual plans identified
    - Villages of Tortolita
    - Sanders Grove
    - Uptown at Marana
    - Marana Town Center
  - Proposed route is compatible with existing and long-term plans of the jurisdictions for this area

Arizona G&T Cooperatives

Touchstone Energy® Cooperatives



Reference Features
- Study Area
- Interstate
- Major Roads
- Local Road
- Railroad
- County Boundary
- Municipal Boundary

Utilities
- Existing Substation
- Proposed Substation
- Existing Pipeline

Existing Transmission Lines
- Existing 138kV Transmission Line
- Existing 115kV Transmission Line
- Existing 24.9kV Distribution Line

Planning
- Town of Marana Planning Data

**Approved and conceptual planning data provided by Town of Marana, 2021*

Proposed Route
- Proposed Route Single Circuit 115kV
- Proposed Route Double Circuit 115/138kV
- Route Link Node
- 100 Route Link Number

NORTH

4,000 2,000 0 4,000

Scale in Feet

1 inch = 4,000 feet When Plotted at 11x17 1:48,000

Arizona G&T Cooperatives

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Exhibit H-1
Existing Plans
Saguaro - Marana 115/138kV Transmission Line Project
Arizona G&T Cooperatives

Exhibit I – Noise and Interference

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Data Collection and Analysis
  - Evaluated corona, audible noise, radio interference, television interference, and electric and magnetic field effects
  - Methods based upon the industry standards developed by Bonneville Power Administration (BPA) Corona and Field Effects Program

Exhibit I – Noise and Interference

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Proposed Route Assessment and Impacts
  - No adverse impacts are expected from corona, audible noise, radio interference, television interference, and electric and magnetic field effects
  - AEPCO will work with any affected party to resolve concerns raised about noise and interference associated with the Project

Environmental Summary

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Proposed Route is Environmentally Compatible
  - Conforms to applicable general/comprehensive plans; most lands are undeveloped or agricultural
  - Lands are expected to be developed for residential or commercial/employment/mixed use
  - Located adjacent to 4.3 miles of existing power distribution and utility lines, 6.0 miles of road rights-of-way, and 1 existing substation
  - Avoids significant cultural resources present in the eastern portion of study area
  - Design standards and selective mitigation measures further reduce impacts from the project
  - AEPCO will work with landowners and agencies throughout the design and construction process
  - No adverse impacts to existing and planned land use, recreation, visual, cultural, and biological resources
  - No opposition from agencies or the public

EXHIBIT AEPCO-14

TESTIMONY SUMMARY OF TRAVIS LEVITT

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibit.

Testimony Summary of Travis Levitt – Panel 3

Travis Levitt is a Senior Public Involvement Specialist with Burns & McDonnell, Inc. Mr. Levitt leads the public involvement efforts during the routing, siting, and construction of hundreds of miles of transmission line projects for large utility companies in the United States. Mr. Levitt develops necessary project collateral including handouts, letters, notifications, and informative displays used at public open houses, stakeholder meetings, and in mailings. He coordinates across multiple disciplines to manage public impacts.

Mr. Levitt is a strategic communicator with 15+ years of experience engaging the public and stakeholders in the utility, advocacy, and public sectors. He holds a B.A. in Political Science from North Central College. Mr. Levitt is a credentialed Envision Sustainability Professional through the Institute for Sustainable Infrastructure.

At the hearing, Mr. Levitt will provide a detailed overview of the stakeholder engagement process related to the Saguaro to Marana 115/138kV Project. He will explain the methods used to coordinate with stakeholders. Mr. Levitt will describe the analytics and results from the stakeholder engagement process. He will present most of his testimony using a power point presentation, which can be found as Exhibit AEPCO-15.

EXHIBIT AEPCO-15

WITNESS PRESENTATION OF TRAVIS LEVITT

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibit.

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Saguaro to Marana 115/138kV Transmission Line Project

Travis Levitt
Burns & McDonnell, Inc.
Senior Public Involvement Specialist

Introduction

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Employment:

- Burns & McDonnell, Inc.
- Senior Public Involvement Specialist

Education and Experience:

- B.A., Political Science, North Central College – Naperville, IL
- 8 years' experience providing Stakeholder Management Services
- Envision Sustainability Professional (ENV SP)

Role and Responsibility

- Implemented Public Engagement Process
- Virtual Open House Website
- Newsletters
- Comment Forms
- Survey
- Hotline/Email
- Comment Tracking

Testimony Overview

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Public Engagement Phases
  - Newsletter/Mailing
  - Survey Results
  - Comment Tracking
- Virtual Open House Analytics
- Social Media Analytics
- Hotline Calls

Phase 1: 2021 Public Engagement

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Jurisdictional/Agency Briefings

- Town of Marana – June 23, 2021
- Pima County – August 4, 2021
- Arizona State Land Department – August 17, 2021

Phase 2: January-March 2022

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Agency Briefings

- Arizona Department of Transportation

Newsletter

- Mailed to all property owners and residents within 1 mile of the Proposed Route and alternative links in the Project Study Area on January 11, 2022
- Mailing included 1,420 addresses
- Included:
  - Notification of Project
  - High Level Project Information
  - Project Study Area Map
  - Contact Information & Project Website

Saguaro to Marana 115/138kV Transmission Line Project

Este boletín está disponible en español en el sitio web

Arizona G&T Cooperatives

Tucson Electric Power

Project Purpose and Need

Arizona Electric Power Cooperative Inc. (AEPCO) and Tucson Electric Power (TEP) are planning new electrical infrastructure to serve the town of Marana, Arizona and the surrounding area.

The Saguaro to Marana Project planning process is being conducted for AEPCO to construct a new 115 kilovolt (kV) transmission line between the planned Trico Electric Cooperative Inc. Adonis Substation and existing Marana Substation. The Project will connect to the the existing Saguaro Substation located approximately 7 miles northwest of Marana using an existing transmission line. TEP has identified the need for a new 138kV substation within the town of Marana. TEP will need a 138kV transmission line to provide power to this substation.

The Project will increase electric reliability and serve customers' growing energy needs, as well as add transmission capacity to support the development of future energy generation projects.

Project Description

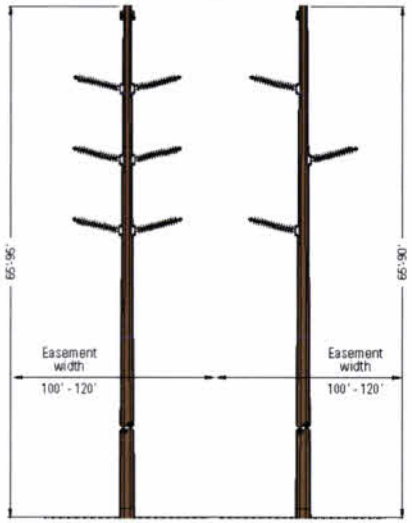
The new Saguaro to Marana 115/138kV line would begin at the planned Adonis Substation and proceed west across Interstate 10, continuing to the planned TEP substation siting area located along West Marana Road between North Sanders Road and North Wentz Road. This portion of the Project will be constructed as a double circuit transmission line. One circuit will be owned and operated by AEPCO, and one circuit will be owned and operated by TEP. The AEPCO circuit will be energized at 115kV, while the TEP circuit will be energized at 138kV. The co-location of AEPCO and TEP assets will minimize environmental impacts and provide efficiencies in the permitting processes required to build the facilities. From the approximate location of the planned TEP 138kV substation, the remainder of the line proceeding westerly to the existing AEPCO Marana Substation will be single-circuit 115kV, solely owned by AEPCO.

The transmission lines will utilize steel monopole (single pole) structures typically ranging in height from 65-95 feet tall, with spans of 500-700 feet in length. Right-of-way will be approximately 100 to 120 feet and may be co-located along existing roads or other utility rights-of-way.

The Project study area, interconnection points, and preliminary route alternatives that are being studied are illustrated on the map included with this newsletter.

Typical Double Circuit Transmission Structure

Proposed Transmission Structures



115 or 138kV **Double** Circuit Tangent Steel Monopole

115 or 138kV **Single** Circuit Tangent Steel Monopole

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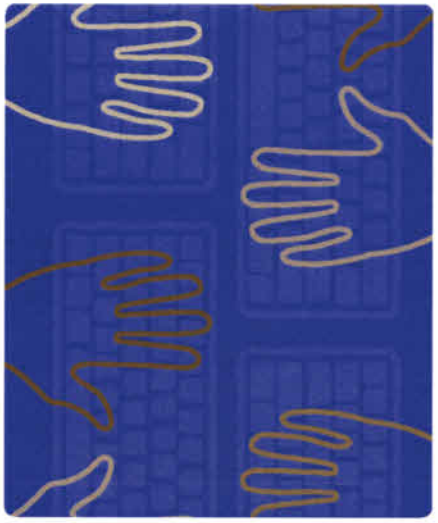
Planning and Permitting Process

Project Purpose and Need	2020
Preliminary Engineering and Environmental Studies	2020
Preliminary Route Identification	Q1-Q3 2021
Public & Agency Outreach	Q3-Q4 2021
Route Selection	Q4 2021-Q1 2022
CEC Application and Hearings	Q2 2022

The diagram to the left illustrates the key tasks and schedule that AEPCO and TEP anticipate for the planning and permitting process. At the conclusion of the environmental and engineering studies and the public process, AEPCO and TEP will submit an application for a Certificate of Environmental Compatibility (CEC) to the Arizona Power Plant and Transmission Line Siting Committee. The Siting Committee will review the application and hear the evidence from the Study Team and any stakeholders participating in the process. This hearing is open to the public, and there will be time allocated for public comments. If the Siting Committee supports the application, they will recommend issuing a CEC and forward it to the Arizona Corporation Commission for final approval.

We Value Your Input



An important component of our planning and permitting process is to receive and consider input from residents, property owners, and businesses within the study area. Members of the community and all interested parties are invited to visit our virtual open house at any time online at www.azgtsaguaromarana.com to learn more about the purpose and need for the Project, the siting process, environmental/ engineering studies, and preliminary route alternatives. We are specifically asking members of communities within the study area to identify issues that are important to them with respect to the proposed transmission lines, as well locational preferences for the preliminary route alternatives considered for the Project, as shown on the map.

Your input will help AEPCO and TEP make decisions regarding the proposed transmission lines. You will be able to provide input via a public comment form on the virtual open house website, emails, or telephone hotline. We invite you to reach out to us using the contact information below or scan the QR code using your smartphone to take you directly to the virtual open house website.

www.azgtsaguaromarana.com saguaromarana@azgt.coop Telephone Hotline: **520-586-5252**

Arizona G&T Cooperatives
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Saguaro to Marana 115/138kV Transmission Line Project Study Area

TEP Tucson Electric Power

VOH Web Address: www.azgtsaguaromarana.com | Email: saguaromarana@azgt.coop | Telephone Hotline: **520-586-5252**

Phase 2: January-March 2022

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Survey

- Captured what factors were most important to respondents to determine a proposed route

- Four responses received
  - All respondents were developing property, represented a business, or lived within the Project study area
  - Three learned of project via mailings, one learned of project via news release

Phase 2: January-March 2022

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Survey Results

Routing Factors	Unimportant	Somewhat Unimportant	Uncertain	Important	Very Important
Maximize distance from homes	0	0	0	2	2
Maximize distance from commercial/industrial facilities/businesses	1	3	0	0	0
Maximize distance from public facilities (e.g. schools, libraries, parks, churches, cemeteries, etc.)	0	1	0	2	1
Minimize crossing agricultural land	1	1	0	2	0
Minimize crossing directly through property (versus along property boundaries)	0	0	0	1	3
Minimize total length of the transmission line and number of angles (reducing the project footprint)	0	1	0	2	1
Maximize distance from historic/cultural sites	0	2	0	2	0
Maximize placement of transmission line along freeways and arterial roads	0	0	0	2	2
Maximize placement of transmission line along existing power lines and utility corridors	0	0	0	1	3

Phase 2: January-March 2022

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Survey Results

- Respondents believe Project was adequately explained

- Respondents were given space to leave open-ended comments/questions about the Project

Phase 3: March-June 2022

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Postcard

- Mailed to all valid addresses of property owners and residents within one mile of the Proposed Route and alternative links in the Project study area on March 9, 2022
- Mailing included 1,353 addresses
- Information Included:
  - Selection of Proposed Route
  - Notification of CEC Hearing
  - Contact Information & Project Website

Saguaro to Marana 115/138kV Transmission Line Project

Tucson Electric Power

NOTICE OF HEARING

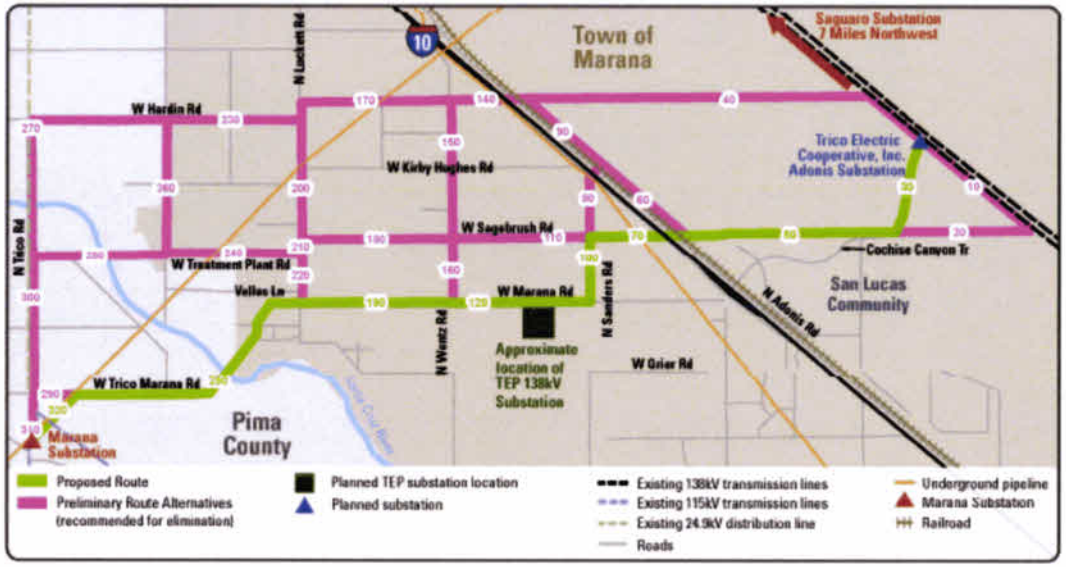
Arizona Electric Power Cooperative, Inc. and Tucson Electric Power have completed the planning process for a new 115/138 kilovolt (kV) transmission line/substation between the planned Trico Electric Cooperative Inc. Adonis Substation and the existing Marana Substation in Marana, Arizona. We welcome feedback regarding the project anytime via our comment form on the project website listed below.

The Proposed Route shown in green on the map (see reverse side) will be requested in an application for a Certificate of Environmental Compatibility from the Arizona Corporation Commission. Public hearings for this project will be held **June 6-10, 2022**. Details regarding the time and location for the hearings will be posted on the project website listed below and announced via social media.

www.azgtsaguaromarana.com | saguaromarana@azgt.coop | 520-586-5252

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Saguaro to Marana 115/138kV Transmission Line Project Proposed Route



Phase 3: March-June 2022

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Contact Us Form Entries*

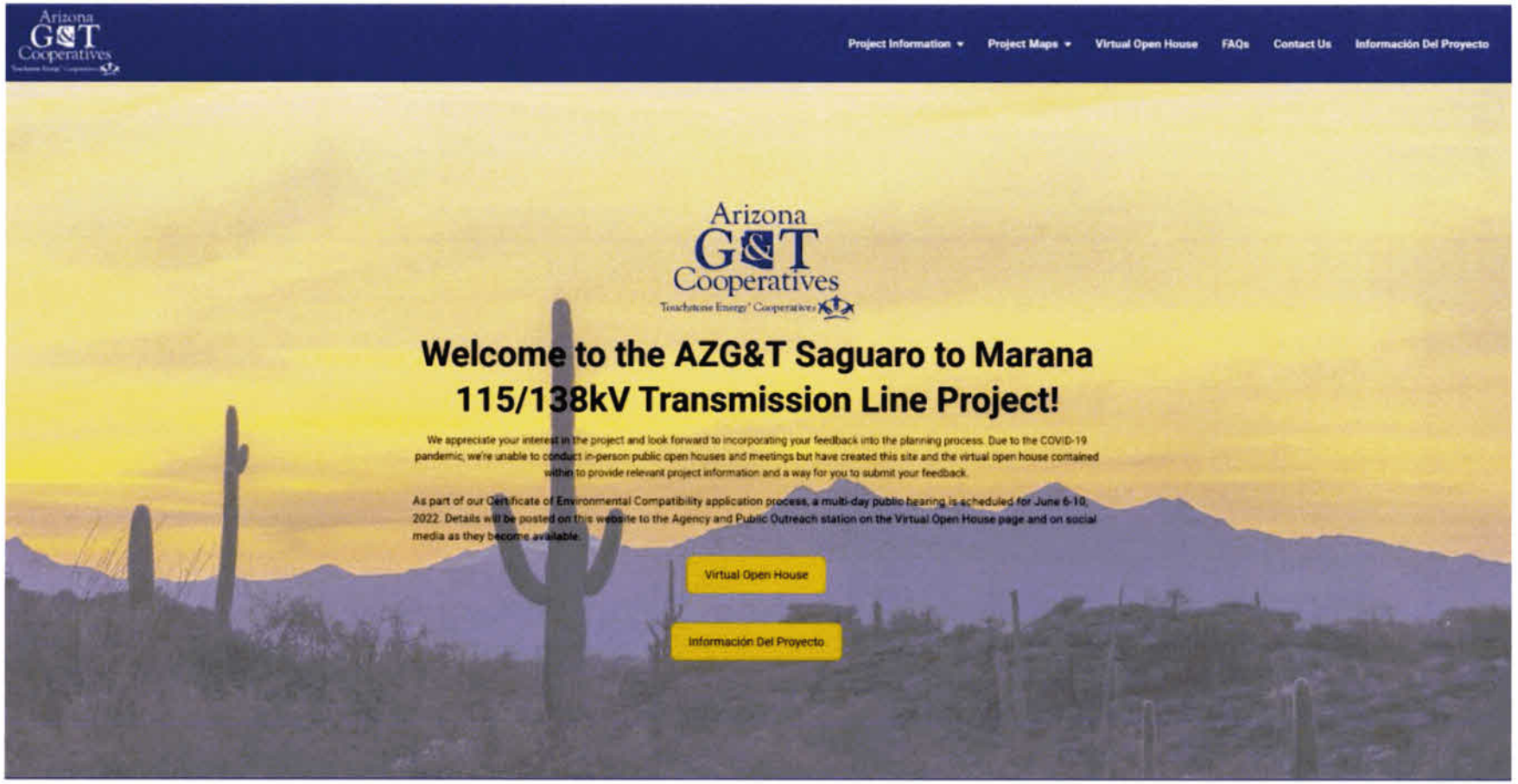
Date	Comment
5/11/22	Addison Construction Co. is a substation construction contractor that has worked with AEPCO on recent projects such as the Valencia, Schieffelin, and currently the Boothill Substations. We would like the opportunity to bid on the substation requirements for the Saguaro to Marana T-Line project, as well as other substation construction and expansion projects that AEPCO and TEP are planning. Please contact us with any questions.
5/16/22	Power lines in existing neighborhoods need to be underground.

*Comments above were received after CEC Application was submitted

Virtual Open House Website

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- azgtsaguaromarana.com
- Launched January 2022
- Included:
  - Project Description
  - Project Purpose and Need
  - Project Maps
  - Educational Information
  - Opportunities for Feedback
- Updated for Phase 3


Arizona G&T Cooperatives
Project Information
Project Maps
Virtual Open House
FAQs
Contact Us
Información Del Proyecto
Arizona G&T Cooperatives
Touchstone Energy® Cooperatives
Welcome to the AZG&T Saguaro to Marana 115/138kV Transmission Line Project!
We appreciate your interest in the project and look forward to incorporating your feedback into the planning process. Due to the COVID-19 pandemic, we're unable to conduct in-person public open houses and meetings but have created this site and the virtual open house contained within to provide relevant project information and a way for you to submit your feedback.
As part of our Certificate of Environmental Compatibility application process, a multi-day public hearing is scheduled for June 6-10, 2022. Details will be posted on this website to the Agency and Public Outreach station on the Virtual Open House page and on social media as they become available.
Virtual Open House
Información Del Proyecto
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Website Analytics – Phase 2

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

January 4, 2022 – March 9, 2022

- Total Users: 237
- Users from Arizona: 113

How Users Got to Website

- 95 users visited the site via Facebook
- 82 users visited the site via QR code or typing the URL into an internet browser
- 48 users were referred to the site via websites owned by UNS Energy Corporation/Tucson Electric Power, and Arizona G&T Cooperatives
- 13 users visited the site through other means that could not be determined by the analytics program

Website Analytics – Phase 3

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

March 9, 2022 – April 18, 2022

- Total Users: 103
- Users from Arizona: 50

How Users Got to Website

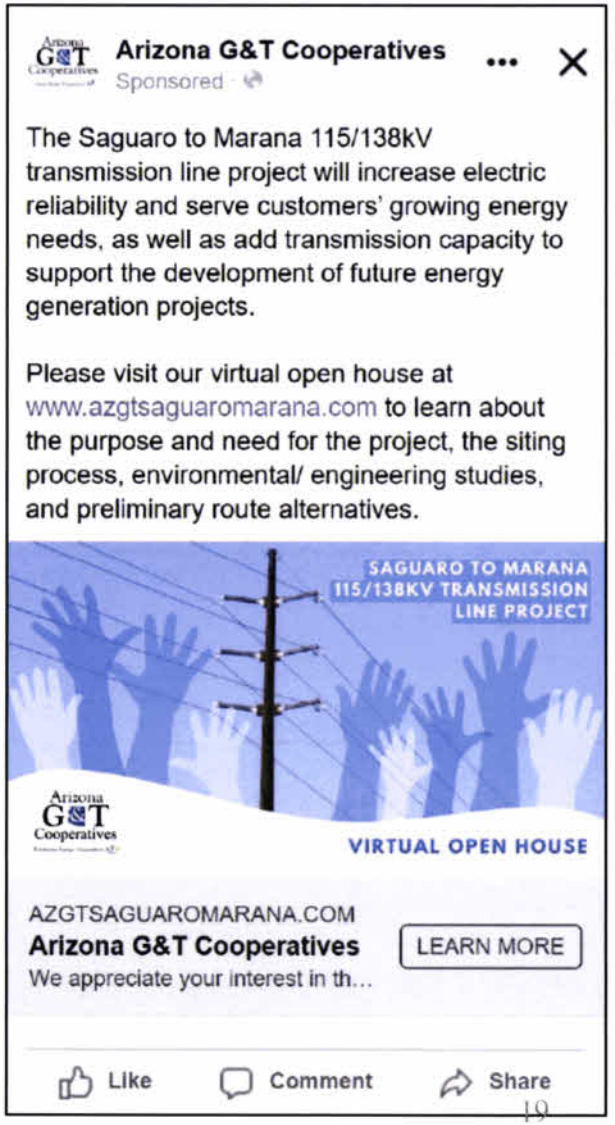
- 42 users visited the site via Facebook
- 42 users visited the site via QR code or typing the URL into an internet browser
- 14 users were referred to the site via websites owned by UNS Energy Corporation/Tucson Electric Power, and Arizona G&T Cooperatives
- 5 users visited the site through other means that could not be determined by the analytics program

Social Media

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Facebook Ads

- Our Approach
  - 7 ads posted and managed by Pioneer Utility Resources
  - Tested "Reach" strategy
  - Shift to "Engagement" strategy
  - 47 comments received, interested parties told to visit project website whenever possible



Social Media

Facebook Ads Analytics

Phase 2

Ad Metrics	Impressions	Unique Impressions	Clicks	Engagement
Jan. 31 – Feb 6	21,364	20,492	38	29
Feb. 7 – 13	3,166	2,525	20	61
Feb. 14 – 20	4,045	2,687	133	83
Feb. 21 – 27	5,013	3,259	159	75
Feb. 28 – March 6	5,097	3,158	121	65
TOTAL	38,685	32,121	471	313

Phase 3

Ad Metrics	Impressions	Unique Impressions	Clicks	Engagement
March 7 – 13	5,370	3,292	135	75
March 14 – 20	4,866	2,987	102	62
March 21 – 31	7,169	4,113	149	86
March 30 – April 3	2,748	2,417	320	157
April 4 – 6	3,086	2,789	307	117
April 7 – 10	4,020	3,684	409	161
April 11 – 14	4,345	3,994	273	123
TOTAL	31,604	23,276	1,695	781

Hotline Calls

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Three calls received
  - Two in Phase 2
    - Resident requesting more information on the project
      - Resident was concerned other infrastructure (road) may be included in this project. It was made clear to the resident that this would not include any additional components outside the transmission line.
    - Survey Respondent 2 requesting more information about project's impact on development property
  - One in Phase 3
    - Resident requesting information on potential for new electric utility provider aside from Trico Electric Cooperative

Feedback Opportunities

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

Project Telephone Hotline

- (520) 586-5252

Project Email Address

- saguaromarana@azgt.coop

Website Contact Form

- azgtsaguaromarana.com/contact-us

Phase 2 Survey

- Link to Survey

Public Engagement Summary

Arizona G&T Cooperatives
Touchstone Energy® Cooperatives

- Public engagement process and analytics are described in detail in Exhibit J
- The public engagement process was based upon successful programs we have implemented nationally and in Arizona
- Challenging environment to communicate with public and agencies due to numerous COVID-19 restrictions
- Multiple tools deployed to engage members of the public and agencies in the project, emphasized virtual participation along with in-person meetings
- Public and agencies provided key input for AEPCO to consider when identifying the proposed route
- No opposition from the public or agencies

EXHIBIT AEPCO-16

SUMMARY OF PUBLIC OUTREACH

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibit.

SUMMARY OF PUBLIC OUTREACH EFFORTS

AEPCO SAGUARO TO MARANA 115/138KV TRANSMISSION LINE PROJECT

DOCKET L-00000A-22-0102-00203 (Case No. 203)

May 2022

Introduction

Arizona Electric Power Cooperative, Inc. ("AEPCO") implemented a targeted stakeholder and public involvement process for the Saguaro to Marana 115/138kV Transmission Line Project ("Project"). Virtual public engagement was used in lieu of traditional in-person public meetings not only due to the COVID-19 pandemic, but also to capture a broader audience than traditional public meetings. To engage and involve stakeholders and the public, a website and virtual open house launched in January of 2022. The website contains text, images, and downloadable PDF files displaying project-related materials such as maps, charts, infographics, etc. The materials are deliberate about providing the information that people need to give meaningful input on the Project. The virtual public engagement process used a range of technology and social media tools to successfully capture important information from key stakeholders in the project area. The involvement program launched in Summer 2021 and included the following elements:

- Stakeholder Briefings
- Virtual Open House Website
- Project Newsletters and Postcards
- Social Media
- Public Comments

Three phases of engagement were conducted throughout the planning process. The initial phase occurred from Summer of 2021 through the end of that year. During that time the project team engaged with government agencies to gather officials' input. A member of the Project team also engaged with an interested landowner while conducting a site visit. The second phase began in January of 2022 with the launch of the Project virtual open house website and distribution of an informational newsletter to all property owners and residents within 1 mile of the various links in the Project study area. The newsletter included details on the Project, a map of the study area, a Project hotline phone number, and a Project email address. The public was able to provide comments and take a survey regarding the Project and route selection on the virtual open house website. The third phase of public engagement was marked by the distribution of a postcard and updating of the Project virtual open house website on March 9, 2022. The postcard and website announced the selection of a Proposed Route and the upcoming CEC hearing, and included the Project hotline phone number, and the Project email address.

Stakeholder Briefings

Starting in June of 2021, the Project team conducted meetings to inform government agencies about the Project. These agencies included the Town of Marana, Pima County, and the Arizona

State Land Department. In addition to informing them about the Project, the team was able to gather information and data useful to the Project and designate a primary point of contact and process for communicating with these entities and their elected officials. Additionally, on February 24, 2022, the Project team conversed with the Arizona Department of Transportation via email regarding the Project's potential crossing of Interstate 10. Documentation of all the stakeholder coordination is included in Exhibit J.

Virtual Open House Website

The website at www.azgtsaguaromarana.com launched on January 4, 2022. During this public engagement period, AEPCO checked available data on website activity weekly. From the launch of the site, 618 users visited the website. On average, a user spent one minute and 50 seconds on the website. Of those users, 592 users were located in the United States and 297 of those users came from Arizona.

AZG&T Cooperatives (https://www.azgt.coop/), Trico Electric Cooperative (https://www.trico.coop/), Tucson Electric Power (https://www.tep.com/), and the Town of Marana (https://www.maranaaz.gov/) posted information about the project on their respective websites. You can view images of those postings through Exhibit J.

Project Newsletters and Postcards

The newsletter was mailed on January 11, 2022, to all property owners and residents within 1 mile of the various links in the Project study area. The newsletter contained an explanation of the need for the Project, a detailed Project description, a photo and diagram of potential structures to be used for the Project, a projected schedule, an explanation of the importance of public engagement, and project-related contact information. A map of the Project study area and potential routes was included with the newsletter.

A postcard was mailed on March 9, 2022, to all valid addresses of property owners and residents within 1 mile of the Proposed Route and alterative links in the Project study area. The postcard contained a map showing the Proposed Route selection and announced the dates for the CEC hearing as well as opportunities for the public to be involved in the hearing process. Thumbnails and full-page versions of those materials are available in Exhibit J.

Social Media

Following the mailing of the newsletter, a series of seven Facebook ads were released to targeted geographical areas in the Project study area, notifying the public of the Project virtual open house website and the opportunity to learn more and provide comments on the Project. Each of the ads contained the same verbiage and imagery as shown in Exhibit J.

From January through April, the Facebook ads received over 55,000 unique impressions and over 1,000 engagements. A more detailed breakdown of the social media performance is included in Exhibit J.

Public Comments

There were many avenues for providing feedback during each phase of engagement. A Project hotline phone number, a Project email address, and a contact us form on the Project virtual open house website were available during all phases of engagement. Phase two of engagement also featured a survey on the virtual open house website. Following submission of AEPCO's CEC application, two comments were submitted via the contact us form on the Project virtual open house website. Summaries of conversations and responses to public comment are found throughout Exhibit J.

The survey aimed to capture what considerations were most and least important to the public and determine preferred preliminary route alternatives. The Project team received a total of four survey responses during this phase of public engagement. All four survey respondents lived, owned property, or represented a business within the Project study area. Each survey response was submitted in January 2022. On average, the respondents spent eight minutes and 45 seconds completing the survey. A summary of customer feedback and survey results is included in Exhibit J.

The Project hotline was available throughout phases two and three of public engagement and three calls were received.

EXHIBIT AEPCO-17

PROPOSED CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY

DOCKET NO. L-00000A-22-0102-00203 (CASE NO. 203)

Pursuant to the May 5, 2022 Procedural Order, Applicant Arizona Electric Power Cooperative, Inc. provides the following exhibit.

BEFORE THE ARIZONA POWER PLANT AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF ARIZONA ELECTRIC POWER COOPERATIVE, INC. OR ITS ASSIGNEES, IN CONFORMANCE WITHTHE REQUIREMENTS OF A.R.S. § 40-360 et. seq., FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING THE SAGUARO TO MARANA 115 KV TRANSMISSION LINE PROJECT.	Docket No. L-00000A-22-0102-00203 Case No. 203

CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY

A. Introduction

Pursuant to notice given as provided by law, the Arizona Power Plant and Transmission Line Siting Committee ("Committee") held public hearings in Marana, Arizona, on June 6, 2022 through June X, 2022 in conformance with the requirements of the Arizona Revised Statutes ("A.R.S.") § 40-360 *et seq.* for the purpose of receiving evidence and deliberating the Application for a Certificate of Environmental Compatibility (the "Application") filed by Arizona Electric Power Cooperative, Inc. ("AEPCO" or "Applicant") seeking approval to construct a 115/138 kilovolt ("kV") transmission line called the Saguaro to Marana 115/138 kV line ("Saguaro to Marana" or "the Project").

The following members and designees of members of the Committee were present at one or more of the hearing days for the evidentiary presentations, public comment and/or the deliberations:

Paul Katz	Chairman, Designee for Arizona Attorney General
Zachary Branum	Designee of the Chairman, Arizona Corporation Commission ("Commission")
Leonard Drago	Designee for Director, Arizona Department of Environmental Quality

David French	Designee for Director, Arizona Department of Water Resources
Rick Grinnell	Appointed Member, representing the counties
Mary Hamway	Appointed Member, representing cities and towns
James Palmer	Appointed Member, representing agriculture
Karl Gentles	Appointed Member, representing the general public
Jack Haenichen	Appointed Member, representing the general public
Margaret "Toby" Little	Appointed Member, representing the general public

The Applicant was represented by Meghan H. Grabel and Elias Ancharski of Osborn Maledon, P.A. The following party was granted intervention pursuant to A.R.S. § 40-360.05: [intervenor].

At the conclusion of the hearing, the Committee, after considering the (i) Application, (ii) evidence, testimony, and exhibits presented by AEPCO and interveners, and (iii) comments of the public, and being advised of the legal requirements of A.R.S. §§ 40-360 through 40-360.13, upon motion duly made and seconded, voted X to X in favor of granting AEPCO, its successors and assigns, this Certificate of Environmental Compatibility for the construction of the Project.

B. Overview Project Description

The Project will consist of the construction and operation of a new transmission line between the planned Trico Electric Cooperative Inc. ("Trico") Adonis Substation and the existing AEPCO Marana Substation near Marana, Arizona. The Project consists of two separate transmission line configurations. A general location map of the Project is set forth in **Exhibit A**. One portion of the Project is a double-circuit 115/138 kV transmission line to be jointly owned by AEPCO and Tucson Electric Power Company ("TEP") (the 115 kV circuit will be owned and operated by AEPCO, and the 138 kV circuit will be owned and operated by TEP); the other portion of the Project is a single-circuit transmission line owned and operated by AEPCO alone. The transmission line originates at Trico's planned Adonis Substation. The location of the planned Adonis Substation enables AEPCO to connect to an existing transmission line,

then interconnect to Arizona Public Service Company's ("APS") existing Saguaro Substation located approximately seven miles northwest of the planned Adonis Substation. In the future, TEP will connect its 138 kV circuit to TEP's existing 138 kV Quad Circuit adjacent to the planned Adonis Substation. The proposed double-circuit 115/138 kV transmission line would proceed west approximately four miles crossing Interstate 10, continuing to the intersection of Marana Road and Wentz Road. At the intersection of Marana Road and Wentz Road, the 138 kV line will be terminated for future use by TEP once a new substation location has been definitively located. From the intersection of Marana Road and Wentz Road, the line will proceed another four miles as a single circuit 115 kV transmission line to the existing AEPCO Marana Substation.

CONDITIONS

This Certificate is granted upon the following conditions:

1. This authorization to construct the Project shall expire ten (10) years from the date this Certificate is approved by the Commission, with or without modification. Construction of the Project shall be complete, such that the Project is in-service within this ten-year timeframe. However, prior to the expiration of the time period, the Applicant may request that the Commission extend the time limitation. [CEC 196, 198]

2. In the event the Project requires an extension of the term(s) of this Certificate prior to completion of construction, the Applicant shall file such time extension request at least one hundred eighty (180) days prior to the expiration date of the Certificate. The Applicant shall use reasonable means to promptly notify the Board of Supervisors of Pima County, Arizona State Land Department ("ASLD"), and all cities and towns within a five (5) mile radius of the Project and all landowners and residents within a five (5) mile radius of the Project, all persons who made public comment at this proceeding who provided a mailing or email address, and all parties to this proceeding. The notification provided will include the request and the date, time,

and place of the hearing or open meetings during which the Commission will consider the request for extension. Notification shall be no more than three (3) business days after the Applicant is made aware of the hearing date or the open meeting date. [CEC 196, 198]

3. During the development, construction, operation, maintenance and reclamation of the Project, the Applicant shall comply with all existing applicable air and water pollution control standards and regulations, and with all existing applicable statutes, ordinances, master plans and regulations of any governmental entity having jurisdiction including, but not limited to, the United States of America, the State of Arizona, Pima County, and their agencies and subdivisions, including but not limited to the following:

a. All applicable land use regulations;

b. All applicable zoning stipulations and conditions including, but not limited to, landscaping and dust control requirements;

c. All applicable water use, discharge and/or disposal requirements of the Arizona Department of Water Resources and the Arizona Department of Environmental Quality;

d. All applicable noise control standards; and

e. All applicable regulations governing storage and handling of hazardous chemicals and petroleum products. [CEC 196, 198]

4. The Applicant shall obtain all approvals and permits necessary to construct, own, operate, and maintain the Project required by any governmental entity having jurisdiction including, but not limited to, the United States of America, the State, Pima County, and their agencies and subdivisions. [CEC 196, 198]

5. The Applicant shall comply with the Arizona Game and Fish Department ("AGFD") guidelines for handling protected animal species, should any be encountered during construction and operation of the Project, and shall consult with AGFD or U.S.

Fish and Wildlife Service, as appropriate, on other issues concerning wildlife. [CEC 196, 198]

6. The Applicant shall design the Project to incorporate reasonable measures to minimize electrocution of and impacts to avian species in accordance with the Applicant's avian protection program. Such measures will be accomplished through incorporation of Avian Power Line Interaction Committee guidelines set forth in the current versions of *Suggested Practices for Avian Protection on Power Lines and Reducing Avian Collisions with Power Lines manuals*. [CEC 196, 198]

7. The Applicant shall consult the State Historic Preservation Office ("SHPO") with respect to cultural resources. If any archaeological, paleontological, or historical site or a significant cultural object is discovered on state, county or municipal land during the construction or operation of the Project, the Applicant or its representative in charge shall promptly report the discovery to the Director of the Arizona State Museum ("ASM"), and in consultation with the Director, shall immediately take all reasonable steps to secure and maintain the preservation of the discovery as required by A.R.S. § 41-844. [CEC 196, 198]

8. The Applicant shall comply with the notice and salvage requirements of the Arizona Native Plant Law (A.R.S. §§ 3-901 *et seq.*) and shall, to the extent feasible, minimize the destruction of native plants during the construction and operation of the Project. [CEC 196, 198]

9. The Applicant shall make every reasonable effort to promptly investigate, identify and correct, on a case-specific basis, all complaints of interference with radio or television signals from operation of the Project addressed in this Certificate and where such interference is caused by the Project take reasonable measures to mitigate such interference. The Applicant shall maintain written records for a period of five (5) years of all complaints of radio or television interference attributable to operations, together with the corrective action taken in response to each complaint. All complaints

shall be recorded to include notation on the corrective action taken. Complaints not leading to a specific action or for which there was no resolution shall be noted and explained. Upon request, the written records shall be provided to the Staff of the Commission. The Applicant shall respond to complaints and implement appropriate mitigation measures. In addition, the Project shall be evaluated on a regular basis so that damaged insulators or other line materials that could cause interference are repaired or replaced in a timely manner. [CEC 196, 198]

10. If human remains and/or funerary objects are encountered during the course of any ground-disturbing activities related to the construction or maintenance of the Project, the Applicant shall cease work on the affected area of the Project and notify the Director of the ASM as required by A.R.S. § 41-865 for private land, or as required by A.R.S. § 41-844 for state, county, or municipal lands. [CEC 196, 198]

11. Within one hundred twenty (120) days of the Commission's decision approving this Certificate, the Applicant shall post signs in or near public rights-of-way, to the extent authorized by law, reasonably adjacent to the Project giving notice of the Project. Such signage shall be no smaller than a roadway sign. The signs shall advise:

a. Future site of the Project;

b. A phone number and website for public information regarding the Project; and

c. Refer the Public to the Docket https://edocket.azcc.gov/Search/Docket-Search.

Such signs shall be inspected at least once annually and, if necessary, be repaired or replaced, and removed at the completion of construction.

The Applicant shall make every reasonable effort to communicate the decision either approving or disapproving the Certificate in digital media. [CEC 196, 198]

12. Upon the approval of this Certificate by the Committee, the Applicant shall provide cities and towns within five (5) miles of the Project, the Board of Supervisors for Pima County, and known builders and developers who are building upon or developing land within one (1) mile of the centerline of the Project with a written description, including the approximate height and width measurements of all structure types, of the Project. The written description shall identify the location of the Project and contain a pictorial depiction of the facilities being constructed. The Applicant shall also encourage the developers and builders to include this information in their disclosure statements. Upon approval of this Certificate by the Commission, the Applicant may commence construction of the Project. [CEC 196, 198]

13. The Applicant shall use non-specular conductors and non-reflective surfaces for the transmission line structures on the Project. [CEC 196, 198]

14. The Applicant shall be responsible for arranging that all field personnel involved in the Project receive training as to proper ingress, egress, and on-site working protocol for environmentally sensitive areas and activities. Contractors employing such field personnel shall maintain records documenting that the personnel have received such training. [CEC 196, 198]

15. The Applicant shall follow the most current Western Electricity Coordinating Council ("WECC") and North American Electric Reliability Corporation ("NERC") planning standards, as approved by the Federal Energy Regulatory Commission ("FERC"), National Electrical Safety Code ("NESC") standards and Federal Aviation Administration ("FAA") regulations. [CEC 196, 198]

16. The Applicant shall participate in good faith in state and regional transmission study forums to coordinate transmission expansion plans related to the Project and to resolve transmission constraints in a timely manner. [CEC 196, 198]

17. When Project facilities are located parallel to and within one hundred (100) feet of any existing natural gas or hazardous liquid pipeline, the Applicant shall:

a. Ensure grounding and cathodic protection studies are performed to show that the Project's location parallel to and within one hundred (100) feet of such pipeline results in no material adverse impacts to the pipeline or to public safety when both the pipeline and the Project are in operation. The Applicant shall take appropriate steps to ensure that any material adverse impacts are mitigated. The Applicant shall provide to Staff of the Commission, and file with Docket Control, a copy of the studies performed and additional mitigation, if any, that was implemented as part of its annual compliance-certification letter; and

b. Ensure that studies are performed simulating an outage of the Project that may be caused by the collocation of the Project parallel to and within one hundred (100) feet of the existing natural gas or hazardous liquid pipeline. The studies should either: (a) show that such simulated outage does not result in customer outages, or (b) include operating plans to minimize any resulting customer outages. The Applicant shall provide a copy of the study results to Staff of the Commission and file them with Docket Control as part of the Applicant's annual compliance certification letter. [CEC 196, 198]

18. The Applicant shall submit a compliance certification letter annually, identifying progress made with respect to each condition contained in this Certificate, including which conditions have been met. The letter shall be submitted to Commission's Docket Control commencing on December l, 2022. Attached to each certification letter shall be documentation explaining how compliance with each condition was achieved. Copies of each letter, along with the corresponding documentation, shall be submitted to the Arizona Attorney General's Office. With respect to the Project, the requirement for the compliance letter shall expire on the date

the Project is placed into operation. Notification of such filing with Docket Control shall be made to the Board of Supervisors for Pima County, all parties to this Docket, and all parties who made a limited appearance in this Docket. [CEC 196, 198]

19. The Applicant shall provide a copy of this Certificate to the Board of Supervisors for Pima County and ASLD. [CEC 196, 198]

20. Any transfer or assignment of this Certificate shall require the assignee or successor to assume, in writing, all responsibilities of the Applicant listed in this Certificate and its conditions as required by A.R.S. § 40-360.08(A) and R14-3-213(F) of the Arizona Administrative Code. [CEC 196, 198]

21. In the event the Applicant, its assignee, or successor, seeks to modify the Certificate terms at the Commission, it shall provide copies of such request to the Board of Supervisors for Pima County, all parties to this Docket, and all parties who made a limited appearance in this Docket. [CEC 196, 198]

22. The Certificate Conditions shall be binding on the Applicant, its successors, assignee(s), and transferees and any affiliates, agents, or lessees of the Applicant who have a contractual relationship with the Applicant concerning the construction, operation, maintenance, or reclamation of the Project. The Applicant shall provide in any agreement(s) or lease(s) pertaining to the Project that the contracting parties and/or lessee(s) shall be responsible for compliance with the Conditions set forth herein, and the Applicant's responsibilities with respect to compliance with such Conditions shall not cease or be abated by reason of the fact that the Applicant is not in control of or responsible for operation and maintenance of the Project facilities. [CEC 196, 198]

23. The Applicant shall provide the Commission Staff with copies of the interconnection agreement(s) it ultimately enters into with any transmission provider(s) in Arizona with whom it is interconnecting with thirty (30) days of execution of such

agreement(s), with the summary thereof filed at Docket Control, prior to construction of such facilities. [CEC 196]

24. [CEC 198]

FINDINGS OF FACT AND CONCLUSIONS OF LAW

This Certificate incorporates the following Findings of Fact and Conclusions of Law:

1. The Project aids the state and the southwest region of the United States in meeting the need for an adequate, economical, and reliable supply of electric power.

2. The Project aids the state, preserving a safe and reliable electric transmissions system.

3. During the course of the hearing, the Committee considered evidence on the environmental compatibility of the Project as required by A.R.S. § 40-360 *et seq*.

4. The Project and the conditions placed on the Project in this Certificate effectively minimize the impact of the Project on the environment and ecology of the state.

5. The conditions placed on the Project of this Certificate resolve matters concerning balancing the need for the Project with its impact on the environment and ecology of the state arising during the course of the proceedings, and, as such, serve as finding and conclusions on such matters.

6. The Project is in the public interest because the Project's contribution to meeting the need for an adequate, economical and reliable supply of electric power outweighs the minimized impact of the Project on the environment and ecology of the state.

DATED this _____ day of June, 2022.

THE ARIZONA POWER PLANT AND
TRANSMISSION LINE SITING COMMITTEE

By: _____

Paul A. Katz, Chairman

AEPCO - 18

ORIGINAL

0000206907

Utilities Division Director

ARIZONA CORPORATION COMMISSION

May 31, 2022

Mr. Paul A. Katz, Chairman
Arizona Power Plant and
Transmission Line Siting Committee
Assistant Arizona Attorney General
2005 North Central Avenue
Phoenix, Arizona 85004-1592

RE: AEPCO, Inc. Saguaro to Marana 115kV Transmission Line
Line Siting Application 203
Docket Control # L-00000A-22-0102-00203

Dear Chairman Katz:

On May 5, 2022, Arizona Corporation Commission ("ACC" or "Commission") Utilities Division's Staff ("Staff") received your letter regarding Arizona Electric Power Cooperative, Inc.'s ("Applicant" or "Company" or "AEPCO") Application for the issuance of a Certificate of Environmental Compatibility ("CEC") for the Saguaro to Marana 115/138 kilovolt ("kV") Transmission Line Project ("Project"), for the construction and operation of a new transmission line between the planned Trico Electric Cooperative, Inc. ("Trico") Adonis Substation, and the existing AEPCO Marana Substation near Marana, Arizona.

This letter is Staff's response addressing the question of whether the proposed project improves the reliability and/or safety of the operation of the grid and the delivery of power in Arizona, and other legal or technical issues relevant to your statutory review.

PROJECT DESCRIPTION

On April 28, 2022, the Applicant filed an Application for the issuance of a CEC for its Saguaro to Marana 115/138kV Transmission Line Project. The proposed Project is a joint venture between AEPCO and Tucson Electric Power Company ("TEP"). It consists of a new transmission line between the planned Trico Adonis Substation and the existing AEPCO Marana Substation near Marana, Arizona. The Project involves two separate transmission line configurations. One portion is a double-circuit 115/138kV transmission line where the 115kV circuit will be owned and operated by AEPCO, and the 138kV circuit will be owned and operated by TEP. The other portion is a single-circuit 115kV transmission line that will be owned and operated in its entirety by AEPCO. The project will be constructed in its totality by AEPCO. The U.S. Department of Agriculture Rural Utilities Service will provide funding to AEPCO for the construction of the 115kV transmission line single and double circuit portions, while the construction of the 138kV section, will be funded by TEP.

AEPCO and its consultant, Burns & McDonnell, Inc. ("BMcD"), developed a public planning and outreach process to identify environmentally compatible routes for the project, examining an approximate 78.8 square-mile area. More than 30 miles of preliminary route segments were identified. After multiple public participation activities and after incorporating the feedback from agencies and the public, AEPCO and BMcD identified the proposed route to be presented to the Arizona Power Plant and Transmission Line Sitting Committee.

The location of the planned Adonis Substation enables AEPCO to connect its 115kV circuit to an existing transmission line and then interconnect to Arizona Public Service Company's ("APS") existing Saguaro Substation, located seven miles northwest of the mentioned Adonis Substation. TEP will connect its 138kV circuit to TEP's existing 138kV Quad Circuit, adjacent to the planned Adonis Substation. The double-circuit line will proceed west for approximately four miles, crossing Interstate 10, continuing to the intersection of West Marana Road and North Sanders Road. At this point, the 138kV line will be terminated for future use by TEP, once a new substation location has been identified. From there, the line will continue west, for another three to four miles, as a single-circuit 115kV transmission line, to the existing Marana Substation. This route is located within the jurisdiction of the town of Marana, Pima County, Arizona, on Federal, State, and privately owned land.

The Company states the purpose of the Project is to increase electric reliability and serve customers' growing energy needs in the area surrounding the Project, by connecting the Trico and AEPCO substations to APS's Saguaro substation. This Project will specifically serve rapidly growing load in the service territory north of Marana, which at present, is only served by a single radial 46kV substation (Thornydale). The Company also states the Project will add transmission capacity to the AEPCO transmission system, to support the development of future generation projects. TEP has also identified that the proposed project will increase reliability within its service area.

The impact of the Project was evaluated in several ways, performing dedicated system analyses. These studies show that the proposed connection between Marana and Saguaro substations will resolve reliability issues identified in the area South of Saguaro. The same line would provide power delivery to Trico and allow for better utilization of the existing transmission assets.

The environmental studies included in the Application indicate that because the Project would be constructed in areas subject to previous disturbance and outside of areas that provide essential habitat for rare or endangered species, impacts on most special-status species present in the region would not occur or would not rise to a level that would require mitigation.

CONCLUSIONS AND RECOMMENDATIONS

Based on Staff's review of the Application, as well as the Applicant's response to Staff's data request, Staff believes that the reliability and safety of the grid would be improved with the addition of the proposed double-circuit 115/138kV and single-circuit 115kV transmission lines.

Staff recommends inclusion, as a condition to any CEC the Line Siting Committee may issue, of the standard cathodic study condition to evaluate the risk to any existing natural gas or hazardous liquid pipelines as follows:

When project facilities are located parallel to and within 100 feet of any existing natural gas or hazardous liquid pipeline, Applicant shall:

(a) Ensure grounding and cathodic protection studies are performed to show that the project's location, parallel to and within 100 feet of such pipeline, results in no material adverse impacts to the pipeline or to public safety, when both the pipeline and the project are in operation. The Applicant shall take appropriate steps to ensure that any material adverse impacts are mitigated. The Applicant shall provide Staff and file with Docket Control, a copy of the studies performed and additional mitigation if any, that was implemented as part of its annual compliance-certification letter, and

(b) Ensure that studies are taken during an outage simulation of the project, that may be caused by the collocation of the project parallel to and within 100 feet of the existing natural gas or hazardous liquid pipeline. The studies should either:

i) show that such simulated outage does not result in customer outages, or
ii) include operating plans to minimize any resulting customer outages. The Applicant shall provide a copy of the study results to Staff and file with Docket Control as part of its annual compliance-certification letter.

If there are any questions, please contact me at (602) 542-6935, or Teresa Brown at (602) 542-0828.

Sincerely,

Elijah O. Abinah
Director
Utilities Division

On this 31st day of May 2022, the foregoing document was filed with Docket Control as a Utilities Division Correspondence, and copies of the foregoing were mailed on behalf of the Utilities Division to the following who have not consented to email service. On this date or as soon as possible thereafter, the Commission's eDocket program will automatically email a link to the foregoing to the following who have consented to email service.

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By: _____
Lorena Ayala
Administrative Assistant I