ORIGINAL

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Tucson Electric Power Company

P.O. Box 711, Tucson, AZ 85702
88 East Broadway Blvd., Tucson, Arizona 85701

January 31, 2012

Arizona Corporation Commission
DOCKETED
JAN 31 2012
DOCKETED BY

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

Re: Notice of Filing – Tucson Electric Power Company's 2012-2021 Ten-Year Plan and Reliability-Must-Run Report
Docket No. E-00000D-11-0017

Pursuant to ARS § 40-360.02, enclosed please find an original and thirteen copies of Tucson Electric Power Company's ("TEP") 2012-2021 Ten-Year Plan. As part of the Biennial Transmission Assessment ("BTA"), also attached is TEP's Reliability-Must-Run Report. In accordance with the last BTA, approved in Decision No. 72031 (December 10, 2010), TEP is including information on planned transmission reconductor projects, transformer capacity upgrade projects, and reactive power compensation facility additions at the 115 kV and above levels.

If you have any questions, please contact me at (520) 884-3680.

Sincerely,

Jessica Bryne

Jessica Bryne

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2012 JAN 31 P 2: 07
AZ CORP COMMISSION
DOCKET CONTROL

cc: Prem Bahl, Utilities Division, ACC
Compliance Section, ACC

A UniSource Energy Company

TUCSON ELECTRIC POWER COMPANY
TEN YEAR PLAN
FOR YEARS
2012-2021

SUBMITTED TO THE

ARIZONA CORPORATION COMMISSION

JANUARY 2012

DOCKET NO: E-00000D-11-0017

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INTRODUCTION

EHV Transmission System

Tucson Electric Power Company (TEP) is a member of the WestConnect Planning Area and the Southwest Area Transmission (SWAT) Sub-Regional Planning Group. TEP participates in various SWAT subcommittees, including: Central Arizona Transmission (CATS), Colorado River Transmission (CRT), and Southeast Arizona Transmission System (SATS). Each of these subcommittees has been involved in studying various generation and transmission projects to enhance and increase utilization of the existing system. The SATS study includes all or part of Pima, Pinal, Cochise, and Santa Cruz counties and has the largest direct impact on TEP. TEP has chaired this subcommittee since its inception.

TEP is a participant in the Pinal West - Pinal Central portion of the SRP Pinal West - Pinal Central - Randolph - Abel - Browning 500 kV Project. TEP plans to construct a 500 kV line between the proposed Pinal Central Switchyard and TEP's Tortolita Substation. The Pinal Central to Tortolita 500kV project is scheduled to be in-service in 2014.

TEP is evaluating various EHV alternatives to increase load serving capability within TEP's Planning Authority Area. Projects under consideration include a 345 kV line between TEP's South and Vail substations with a loop in at the Irvington Station, EHV transmission lines between TEP's Tortolita and North Loop Substations, and a double-

circuit 345 kV line between TEP's Winchester and Vail Substations. In addition, TEP is a funding participant in the siting efforts for the SunZia Transmission Project and a study participant in the Southline Project. Additional local 138kV system reinforcement alternatives are also being considered within TEP's service territory.

138kV Local Transmission System

TEP performs an annual review of its 138kV system performance over a ten-year planning horizon. This results in a schedule for new facilities and upgrades to existing facilities assuring adequate transmission capacity within TEP's service territory as the Tucson metropolitan area continues to develop. Capital improvements are proposed for the TEP 138kV system to accommodate new 138/13.8kV substations, address increased line loading, and mitigate localized stability issues.

Load projection analysis focuses on distribution system needs and shows the impact of load growth at each of TEP's distribution substations. This analysis identifies new 138/13.8 kV substations and new 138kV transmission lines that are needed. Load projection also provides input to the power flow analysis used to identify thermal overloads as loads in Tucson continue to grow.

Power flow analysis is conducted to identify thermal overloads and voltage violations under normal and contingency conditions as required by the NERC Reliability Standards and the WECC System Performance Criteria. Mitigation is then determined

such that the performance measures of the NERC Reliability Standards and WECC System Performance Criteria are met for Category A, B and C conditions.

Contingencies include:

- Loss of major EHV import transmission facilities
- Loss of critical local generation
- Single 138kV circuit outages
- Credible 138kV multiple circuit outages
- Critical circuits initially out of service with the system adjusted to normal conditions followed by a subsequent outage.

Violations of the NERC Reliability Standards and WECC System Performance Criteria are mitigated by proposed system improvements including the following:

- New transmission lines;
- Uprates to existing lines (including increase to conductor clearances, upgrade of station equipment, or reconductoring);
- New local generation (when more cost effective than transmission);
- Additional 138 kV shunt capacitor banks;
- Other cost-effective measures.

Stability issues are resolved through transmission system reinforcement and/or the application of Flexible AC Transmission System (FACTS) devices. For example, TEP plans to install a 12.5 MVAr STATCOM at the Toro Switchyard following the addition

of the Rosemont load to the TEP 138 kV system and completion of the loop of the Green Valley 138 kV transmission system.

TEP EHV and local area 138kV transmission systems with facility additions or uprates are shown graphically in Figures 1, 2, and 3, and followed by individual project descriptions. Note that in-service dates shown as "TBD" are beyond the ten-year horizon. Figure 1, *Existing and Planned EHV Transmission Facilities Map;* and Figure 2, *Existing and Planned EHV Transmission Facilities One-Line Diagram* show existing and proposed EHV transmission for portions of TEP and neighboring systems. Existing 500kV, 345kV, 230kV, and 138 kV lines are depicted as solid red, green, blue, and orange lines respectively. Proposed lines are shown in the same colors, but as thicker dashed lines. Lines owned by others are shown in the same color but as dotted lines. Proposed Substations are shown in the same color but with a black border.

Biennial Transmission Assessment Orders

In Decision No. 72031 regarding the 6th Biennial Transmission Assessment (BTA), the Arizona Corporation Commission ("ACC" or "Commission") issued the following orders relevant to TEP:

1) SWTC, APS, Tucson Electric Power Company ("TEP") and Sulphur Springs Valley Electric Cooperative ("SSVEC") shall jointly complete additional actions and file specified information related to the Cochise County Study Group plan of service with the Commission as follows:

a) By June 30, 2011, identify the components of the plan in a facilities report that provide the most benefit to customer reliability and can be implemented in the shortest timeframe, and file a progress report with the Commission that includes planned in-service dates for all relevant elements of the plan reflecting these priorities.

b) By September 30, 2011, submit a progress report including in-service dates for the components of the plan of service identified in the June 30, 2011, facility study. This schedule shall reflect the most recent load forecast.

c) By December 31, 2011, substantially complete contractual negotiations with affected parties over cost responsibility, wheeling arrangements, Engineering, Procurement and Construction ("EPC"), operations and maintenance, etc. (described as pending items in the CCSG 2009 report), and file a draft memorandum of understanding among affected parties addressing these items with the Commission.

d) By June 30, 2012, file a progress report with the Commission including an executed memorandum of understanding between the parties that includes planned in-service dates for all remaining elements of the plan in the 2013-2018 timeframe. If applicable, in-service dates beyond 2013-2018 may be proposed for later stages of the plan if justified by documented changes in the load forecast[i].

e) By December 31, 2012, seek to obtain all required approvals and permits needed to complete remaining components of the plan, and file a progress

[i] Load forecast updates may include the impacts of energy efficiency improvements, demand side management, demand response, distributed generation and other applicable factors.

report on plan implementation with the Commission. If any related approvals or permits from appropriate regulatory agencies are still pending at that time, the progress report shall identify a clear action plan and proposed schedule to obtain such approvals.

2) The jurisdictional utilities shall report relevant findings in future BTAs regarding compliance with transmission planning standards (e.g., TPL-00 1 through TPL-004) from NERC/WECC reliability audits that have been finalized and filed with FERC.

3) APS, SWTC and TEP shall conduct additional analysis of potential 230 kV and 138 kV voltage deviations in Southeastern Arizona as noted in the 2009 SATS report and file an update based on the 2010 SATS by February 28, 2011, and shall finalize mitigation plans if needed for this voltage concern in ten-year plan filing(s) for the 7th BTA by January 31, 2012.

4) Jurisdictional utilities shall continue to perform RMR studies in accordance with the methodology set forth in Appendix C to this Sixth BTA, and shall file such studies with ten-year plans for inclusion in future BTA reports.

5) Jurisdictional utilities shall include planned transmission reconductor projects, transformer capacity upgrade projects and reactive power compensation facility additions at 115 kV and above in future BTA ten-year plan filings.

6) In addition, we believe that the jurisdictional utilities should include the effects of distributed renewable generation and energy efficiency programs on future transmission needs in future ten-year plan filings, beginning in January 2011 , and that these effects be discussed in future BTAs.

7) The Commission is mindful of the interest in Arizona's abundant supply of renewable energy, and the potential for these energy resources to be tapped by surrounding states to meet their RPS obligations. We would like the utilities to jointly conduct or procure a study, as well as a stakeholder workshop, to identify the barriers to and solutions for enhancing Arizona's ability to export renewable energy, including identifying specific transmission corridors that should be built out in order to accomplish this objective. The study and results of the workshop should be filed at the Commission no later than November 1, 2011, and shall be included as part of the 2012 BTA.

Cochise County Study Group (CCSG)

TEP has a single customer, Fort Huachuca, located in Cochise County and is participating in the Cochise County Study Group. In 2011, Southwest Transmission Cooperative filed the required reports with the Commission on behalf of APS, SSVEC, and TEP. TEP will continue to participate in the CCSG in 2012 to address the remaining issues.

NERC/WECC Reliability Audit

A reliability audit of TEP was conducted by WECC and NERC between August 22 and September 2, 2011. TEP received a report of "no findings" for the Transmission

Planning Standards (TPL-001 through TPL-004). TEP's next reliability audit is expected to occur in 2014.

Reliability Must Run (RMR) Generation Study

TEP conducted RMR studies for 2014 and 2021 planned systems. The RMR analysis included RMR for forecasted peak load, Simultaneous Import Limit with no local generation, and Maximum Load Serving Capability. The results of this study are included in the report included with this filing.

Load Forecasts

TEP's 2012 – 2021 Ten-Year Plan was developed based on the Corporate Forecast approved in February 2011. This forecast took into account distributed renewable generation, energy efficiency programs, Network Integrated Transmission Service (NITS) customer load forecasts, as well as TEP retail customer load.

Renewable Energy Transmission Export Capability Study

APS, SRP, SWTC, and TEP/UNSE conducted the Renewable Energy Transmission Export Capability Study in 2011. The study report was filed by APS on behalf of the participants.

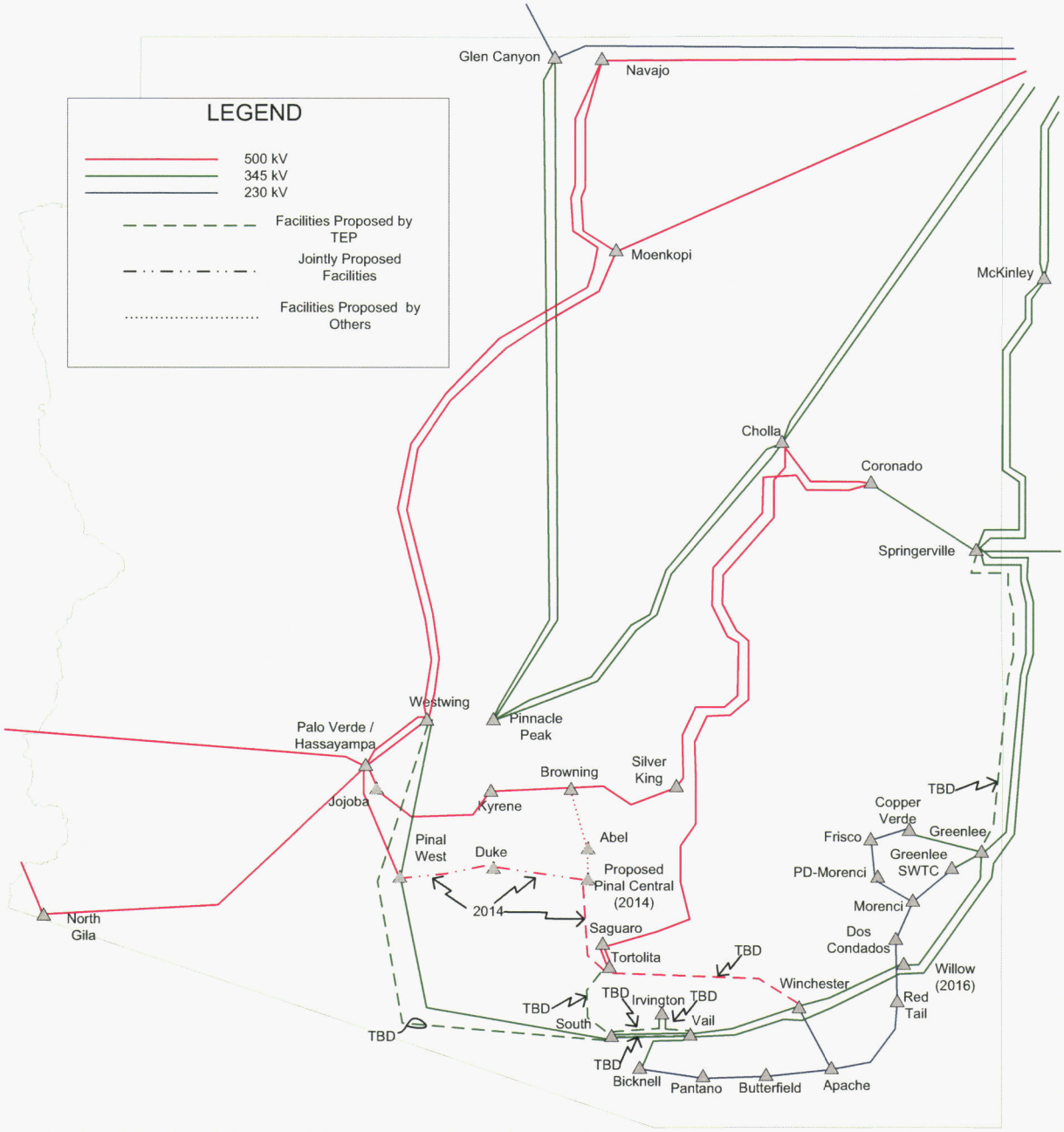

Figure 1. Existing and Planned EHV Transmission Facilities Map

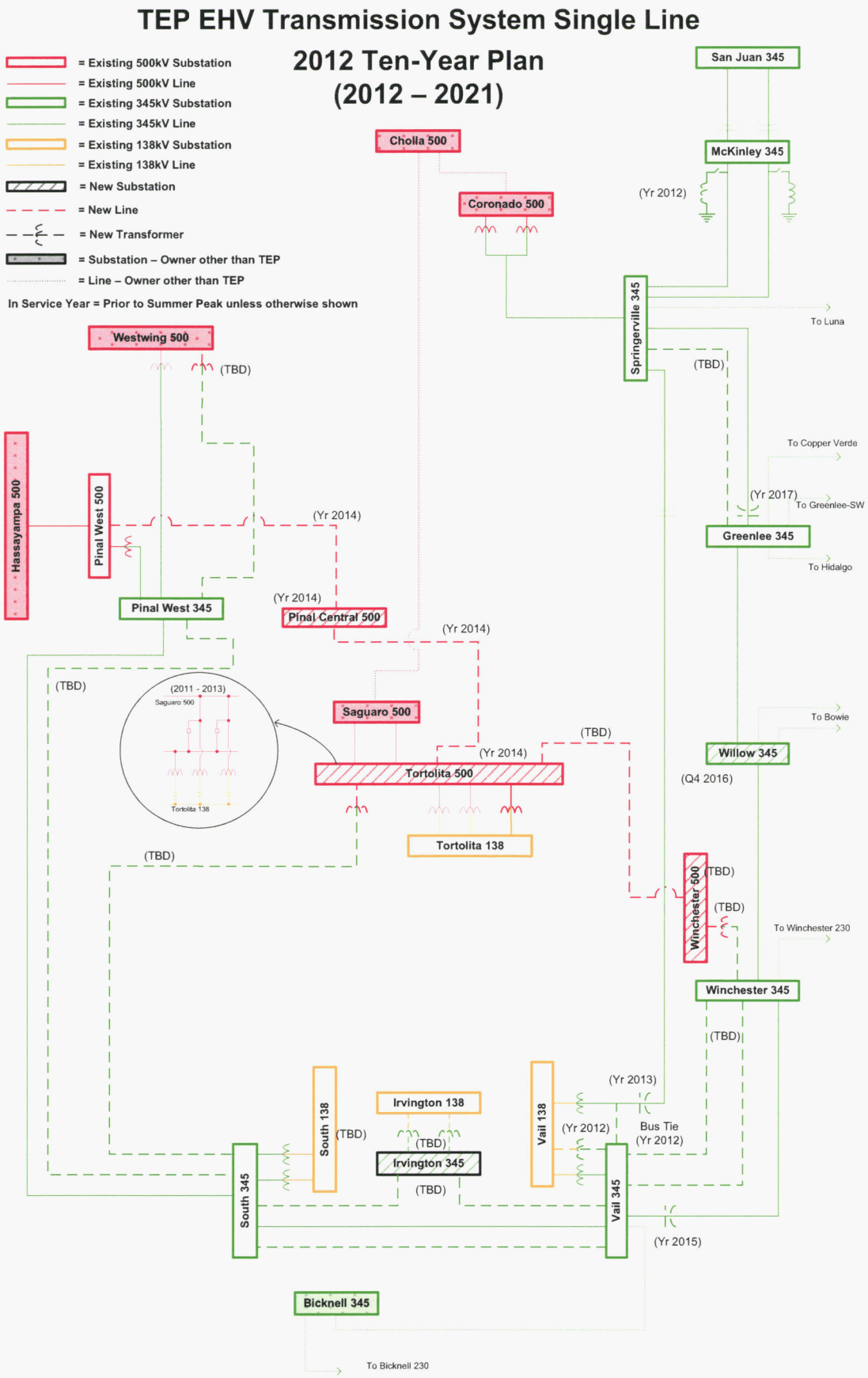

Figure 2. Existing and Planned EHV Transmission Facilities Single-Line Diagram

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Tortolita 500/138kV Transformer T3
Size	
a) Voltage	500/138-kV
b) Capacity	672 MVA Continuous/940 MVA Emergency
c) Point of Origin	Tortolita 500kV Bus
d) Point of Termination	Tortolita 138kv Bus
e) Length	NA
Routing	NA
Purpose	To increase TEP load serving capability.
Date	
a) Construction Start	2010
b) In-Service Date	2011 – Completed[ii]
Is Certificate Necessary	No
Technical Studies	Completed

[ii] This will be removed in future Ten-Year Plans

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Vail 345/138kV Transformer T3
Size	
a) Voltage	345/138-kV
b) Capacity	672 MVA Continuous/806 MVA Emergency
c) Point of Origin	Vail 500kV Bus
d) Point of Termination	Vail 138kv Bus
e) Length	NA
Routing	NA
Purpose	To increase TEP load serving capability and provide delivery point to UNSE.
Date	
a) Construction Start	2011
b) In-Service Date	2012
Is Certificate Necessary	No
Technical Studies	Completed

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	McKinley 345kV Substation Reactor Addition
Size	
a) Voltage	345-kV
b) Capacity	60 MVAR
c) Point of Origin	McKinley Substation
d) Point of Termination	McKinley Substation
e) Length	NA
Routing	NA
Purpose	To mitigate high voltages at McKinley during low flow conditions.
Date	
a) Construction Start	2012
b) In-Service Date	2012
Is Certificate Necessary	No
Technical Studies	Completed

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Series Capacitor Replacement at Vail 345kV Substation (Springerville – Vail 345kV Line)
Size	
a) Voltage	345-kV
b) Capacity	1195 MW Continuous/1494 MW Emergency
c) Point of Origin	Vail Substation
d) Point of Termination	Vail Substation
e) Length	NA
Routing	NA
Purpose	To upgrade existing equipment.
Date	
a) Construction Start	2012
b) In-Service Date	2013
Is Certificate Necessary	No
Technical Studies	Completed

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Pinal West Substation to Pinal Central Substation
Size	
a) Voltage	500-kV
b) Capacity	1500 MVA
c) Point of Origin	Pinal West substation
d) Point of Termination	Future Pinal Central Substation
e) Length	Approximately 38 miles
Routing	South and east from the Pinal West substation to approximately Teel Road, then east to the vicinity of the Santa Rosa substation. From Santa Rosa easterly to approximately the Santa Rosa Wash, then generally south to approximately a half mile north of I-8 where it turns east again. Then it runs easterly to about the location of the ED2 substation (Sec 25, T6S, R7E).
Purpose	TEP is a participant in the project that will provide a higher capacity link for the flow of power from the Palo Verde area into TEP's northern service territory.
Date	
a) Construction Start	2013
b) In-Service Date	2014
Is Certificate Necessary	Case Number 126
Technical Studies	Completed

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Pinal Central Substation to Tortolita Substation
Size	
a) Voltage	500-kV
b) Capacity	System dependent
c) Point of Origin	Future Pinal Central substation
d) Point of Termination	Tortolita Substation (Sec. 14 T10S R10E)
e) Length	Approximately 38 miles
Routing	Unknown
Purpose	To reinforce TEP's EHV system and to provide a higher capacity link for the flow of power from the Palo Verde area into TEP's northern service territory.
Date	
a) Construction Start	2013
b) In-Service Date	2014
Is Certificate Necessary	Yes
Technical Studies	Completed

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Series Capacitor Replacement at Vail 345kV Substation (Winchester – Vail 345kV Line)
Size	
a) Voltage	345-kV
b) Capacity	1195 MW Continuous/1494 MW Emergency
c) Point of Origin	Vail Substation
d) Point of Termination	Vail Substation
e) Length	NA
Routing	NA
Purpose	To upgrade existing equipment.
Date	
a) Construction Start	2014
b) In-Service Date	2015
Is Certificate Necessary	No
Technical Studies	Completed

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Interconnection of Greenlee – Winchester 345 kV with future Willow 345 kV Substation
Size	
a) Voltage	345-kV
b) Capacity	System dependent
c) Point of Origin	Greenlee - Winchester
d) Point of Termination	Future Willow substation
e) Length	Less than 1 mile
Routing	Adjacent to Greenlee - Winchester 345 kV line.
Purpose	To accommodate interconnection of Bowie Power Station.
Date	
a) Construction Start	2015
b) In-Service Date	2016
Is Certificate Necessary	CEC was obtained by Southwestern Power Group – Case number 118
Technical Studies	SATS and Interconnection Studies per TEP OATT.

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	SunZia Southwest Transmission 500kV Project
Size	
a) Voltage	500-kV
b) Capacity	Approximately 3000 MVA
c) Point of Origin	Central New Mexico
d) Point of Termination	Proposed Pinal Central Substation
e) Length	Approximately 460+ miles
Routing	From Lincoln County area in central New Mexico to Pinal Central Substation in Coolidge, Arizona.
Purpose	Provide TEP and participants access to anticipated renewable generation resources in Southeastern Arizona and New Mexico.
Date	
a) Construction Start	TBD
b) In-Service Date	2015/2016
Is Certificate Necessary	Yes
Technical Studies	Studies in progress

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Series Capacitor Replacement at Greenlee 345kV Substation (Springerville – Greenlee 345kV Line)
Size	
a) Voltage	345-kV
b) Capacity	1195 MW Continuous/1494 MW Emergency
c) Point of Origin	Greenlee Substation
d) Point of Termination	Greenlee Substation
e) Length	NA
Routing	NA
Purpose	To upgrade existing equipment.
Date	
a) Construction Start	2016
b) In-Service Date	2017
Is Certificate Necessary	No
Technical Studies	Completed

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Vail Substation to Irvington Substation
Size	
a) Voltage	345-kV
b) Capacity	System dependent
c) Point of Origin	Vail Substation (Sec. 4 T16S R15E)
d) Point of Termination	Irvington Substation (Sec. 03 T15S R14E)
e) Length	Approximately 11 miles
Routing	Unknown
Purpose	To reinforce TEP's EHV system and to provide a new tie between TEP's HV and EHV systems.
Date	
a) Construction Start	TBD
b) In-Service Date	TBD
Is Certificate Necessary	Yes
Technical Studies	Studies in progress via SATS, SWAT and internal TEP study efforts.

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Irvington Substation to South Substation
Size	
a) Voltage	345-kV
b) Capacity	System dependent
c) Point of Origin	Irvington Substation (Sec. 03 T15S R14E)
d) Point of Termination	South Substation (Sec. 36 T16S R13E)
e) Length	Approximately 16 miles
Routing	Unknown
Purpose	To reinforce TEP's EHV system and to provide a new tie between TEP's HV and EHV systems.
Date	
a) Construction Start	TBD
b) In-Service Date	TBD
Is Certificate Necessary	Yes
Technical Studies	Studies in progress via SATS, SWAT and internal TEP study efforts.

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Tortolita Substation to Winchester Substation
Size	
a) Voltage	500-kV
b) Capacity	System dependent
c) Point of Origin	Tortolita Substation (Sec. 14 T10S R10E)
d) Point of Termination	Winchester Substation
e) Length	Approximately 80 miles
Routing	As described in Siting Case Number 23
Purpose	To reinforce TEP's EHV system and to provide a higher capacity link 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	Case Number 23
Technical Studies	Studies in progress via SWAT, SATS and internal TEP study efforts.

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Vail Substation to South Substation – 2nd circuit
Size	
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 to existing Vail – South Line
Purpose	To reinforce TEP's EHV 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	Case Number 15
Technical Studies	Studies in progress via SWAT, SATS and internal TEP study efforts.

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Springerville Substation to Greenlee Substation - 2nd circuit
Size	
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 to existing Springerville to Greenlee line.
Purpose	To deliver power and energy from major TEP interconnections in the Four Corners and Eastern Arizona regions.
Date	
a) Construction Start	TBD
b) In-Service Date	TBD
Is Certificate Necessary	Case numbers 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 system in the 70's. This project is based on that original work. Detailed studies will be developed in the future upon a determination of need for this project by TEP.

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Tortolita Substation to South Substation
Size	
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 to existing Westwing – South line to South Substation.
Purpose	To reinforce TEP's EHV system and to provide a high capacity link for the flow of power in Southern Arizona.
Date	
a) Construction Start	TBD
b) In-Service Date	TBD
Is Certificate Necessary	Case Number 50
Technical Studies	Studies conducted in coordination with neighboring utilities formed the basis for the design of TEP's original EHV system in the 70's. This project is based on that original work. Detailed studies will be developed in the future upon a determination of need for this project by TEP.

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Westwing Substation to South Substation – 2nd circuit
Size	
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 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	Case Number 15
Technical Studies	Studies conducted in coordination with neighboring utilities formed the basis for the design of TEP's original EHV system in the 70's. This project is based on that original work. Detailed studies will be developed in the future upon a determination of need for this project by TEP. To be reviewed in SWAT, SATS and internal TEP studies.

HV Plans

The TEP 138kV existing and planned local area transmission system is shown in Figure 3. *TEP Local Area 138kV Ten Year Transmission Plan*. Existing substations and lines are shown as green blocks and solid black lines respectively. Proposed substations are shown as yellow blocks and proposed lines are in red. Reconductor projects are shown in subdued red.

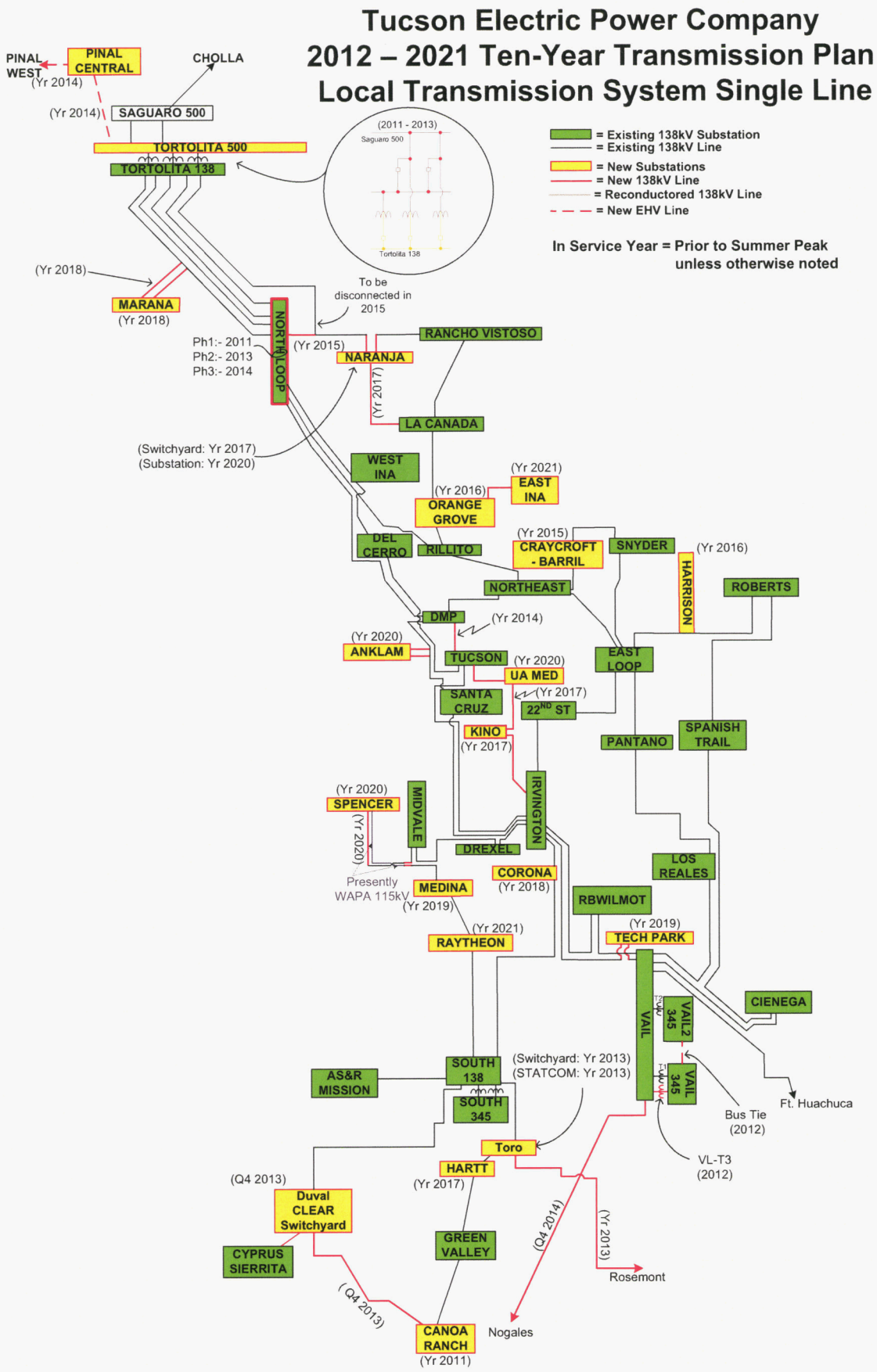

Figure 3. TEP Local Area 138kV Ten Year Transmission Plan

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Vail Substation to East Loop Substation through Spanish Trail and Roberts Substations, looping-in the Roberts-East Loop line to the new Harrison Substation.
Size	
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	Phase 1: Vail Substation to East Loop Substation - 22 Miles Phase 2: East Loop – Roberts – 7 miles Spanish Trail to Roberts – 5.75 miles Phase 3: Vail Substation to East Loop Substation - 22 Miles Phase 4: East Loop – Harrison – approximately 3 miles Roberts – 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 local transmission system.
Date	
a) Construction Start	1976
b) In-Service Date	Phase 1 - 1977 Spanish Trail

	(Completed)	Substation to East Loop and Vail Substation
	Phase 2 - 1983 (Completed)	Roberts Substation and associated 138-kV lines
	Phase 3 – TBD	Third 138-kV line from Vail to East Loop Substation
	Phase 4 - 2016	Harrison Substation loop-in of the Roberts-East Loop 138 kV line
Is Certificate Necessary	Case Number 8	

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Irvington Substation to East Loop Substation (through 22nd Street Substation)	
Size		
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	
	Phase 1: Irvington Station 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 local transmission system.	
Date		
a) Construction Start	1985	
b) In-Service Date	Phase 1 – 1994 (Completed)	Irvington Station to 22nd St. Substation
	Phase 2 – 2000 (Completed)	22nd Street to East Loop Substation
	Phase 3 – TBD	2nd Circuit of Phase I
Is Certificate Necessary	Case Number 66	

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	South Substation to Duval CLEAR Switchyard through future Canoa Ranch Substation and Green Valley Substation	
Size		
a) Voltage	138-kV	
b) Capacity	System dependent	
c) Point of Origin	South Substation (Sec. 36 T16S R13E)	
d) Point of Termination	Duval CLEAR Switchyard (Sec. 10 T18S R12E)	
e) Length	South - Green Valley - Approximately 15 miles Green Valley - Canoa Ranch - Approximately 3.5 miles Canoa Ranch - Duval CLEAR Switchyard - Approximately 7.5 miles	
Routing	Uses existing transmission, sub-transmission, and overhead distribution route.	
Purpose	To provide additional electrical service to southern area of TEP's service area and to reinforce the local transmission & distribution system.	
Date		
a) Construction Start	1995	
b) In-Service Date	Phase 1 -1997 (Completed)	South 138-kV line to Green Valley.
	Phase 2a -2006 (Completed)	138-kV line from Green Valley to future Canoa Ranch Substation site

	Phase 2b- 2013	Extend 138-kV line from Canoa Ranch Substation site to future Duval CLEAR Switchyard
Is Certificate Necessary	Case 84 (Extension approved in 2006 Commission Decision No. 69680 (June 28, 2007))	

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Tortolita Substation – North Loop Substation, North Loop Substation – Rancho Vistoso Substation and Tortolita – Rancho Vistoso 138 kV corridor expansion and reconfiguration
Size	
a) Voltage	138-kV
b) Capacity	System dependent
c) Points of Origin	Tortolita 138 kV Substation North Loop 138 kV Substation
d) Points of Termination	North Loop 138 kV Substation Rancho Vistoso 138 kV Substation
e) Length	Tortolita – North Loop – approximately 14 miles North Loop – Rancho Vistoso – approximately 11 miles
Routing	Phase 1: Re-configure Tortolita – Rancho Vistoso line as a third Tortolita - North Loop line utilizing existing 138 kV stub out of North Loop. Build new bay at North Loop to accommodate North Loop – Rancho Vistoso line utilizing existing 138 kV pole-line along Tangerine Rd. Phase 2: A new four-circuit pole-line to replace existing single-circuit structures in the Tortolita-North Loop 138 kV corridor. The four-circuit structures will accommodate the two existing Tortolita-North Loop lines, and two new Tortolita – North Loop lines This phase also includes reconfiguring the Tortolita – North Loop #3 and North Loop – Rancho Vistoso 138 kV lines as Tortolita – Rancho Vistoso 138 kV. This was previously a jointly planned

	project between SWTC and TEP but is now solely TEP.
Purpose	Required to meet reliability criteria.
Date	
a) Construction Start	2008
b) In-Service Date	Phase 1: 2008- Completed
	Phase 2: 2011 – Completed[iii]
Is Certificate Necessary	Phase 1: No
	Phase 2: Case Number 149

[iii] This will be removed in future Ten-Year Plans

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Northeast – Snyder 138kV – loop-in for Craycroft-Barril Substation
Size	
a) Voltage	138-kV
b) Capacity	System dependent
c) Point of Origin	Northeast 138 kV Substation
d) Interim Point	Future Craycroft-Barril 138kV Substation
e) Point of Termination	Snyder 138 kV Substation
f) Length	Northeast – Craycroft-Barril – approximately 8 miles Snyder – Craycroft-Barril – approximately 4 miles
Routing	Existing Northeast-Snyder Corridor requires 1 span of wire to drop into station.
Purpose	Required to serve load at the new Craycroft-Barril 138/13.8 kV Substation located approximately 3 miles northeast of the Northeast Substation
Date	
a) Construction Start	2014
b) In-Service Date	2015
Is Certificate Necessary	No

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	DeMoss Petrie Substation – Tucson Station 138 kV
Size	
a) Voltage	138-kV
b) Capacity	System dependent
c) Point of Origin	DeMoss Petrie 138 kV Substation
d) Point of Termination	Tucson 138 kV Substation
e) Length	2.5 miles
Routing	South from DeMoss Petrie for approximately 1.25 miles, turn west for approximately 0.1 miles, turn south for approximately 0.5 miles, then east for approximately 0.4 miles, then northeast for approximately 0.2 miles. (Freeway Route)
Purpose	Required to meet reliability criteria of a localized voltage instability specific to loss of both the North Loop-West Ina and Irvington-Tucson 138 kV circuits.
Date	
a) Construction Start	2013
b) In-Service Date	2014
Is Certificate Necessary	Case Number 157

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Future Toro Switchyard (previously Rosemont Point of Interconnection) to Rosemont Substation 138 kV
Size	
a) Voltage	138-kV
b) Capacity	> 120 MVA
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 Substation (Sec. 30 T18S R16E)
e) Length	Approximately 24 Miles
Routing	Approximately 1 mile east from Toro, then southeast to the intersection of Santa Rita Road and Helvetia Road, then northeast to Rosemont.
Purpose	To provide electrical service to large mine load located ~ 17 miles east-southeast of Green Valley, AZ
Date	
a) Construction Start	2012
b) In-Service Date	2013
Is Certificate Necessary	Case Number 164

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	La Canada Substation – Orange Grove Substation– Rillito Substation 138kV
Size	
a) Voltage	138-kV
b) Capacity	System dependent
c) Point of Origin	La Canada 138 kV Substation
d) Interim Point	Future Orange Grove 138 kV Substation
e) Point of Termination	Rillito 138kV Substation
f) Length	La Canada – Orange Grove – approximately 4 miles Orange Grove – Rillito – approximately 2 miles
Routing	Loop-in of the existing La Canada - Rillito 138kV circuit and drop into new station adjacent to the right-of-way at La Canada Blvd. and Orange Grove Rd.
Purpose	Required to serve load at the new Orange Grove 138/13.8 kV Substation
Date	
a) Construction Start	2015
b) In-Service Date	2016
Is Certificate Necessary	TBD

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Future Toro Switchyard (previously Rosemont Point of Interconnection) STATCOM
Size	
a) Voltage	138-kV
b) Capacity	50-75 MVAr
c) Point of Origin	Future Toro Switchyard
d) Point of Termination	Future Toro Switchyard
e) Length	NA
Routing	To be located in Toro Switchyard.
Purpose	To provide voltage support for post-contingency conditions following interconnection of the Rosemont Mine load to the TEP 138 kV system and completion of the loop of the Green Valley 138 kV system.
Date	
a) Construction Start	TBD
b) In-Service Date	2013
Is Certificate Necessary	No

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Tortolita Substation – Rancho Vistoso Substation to North Loop Substation – Rancho Vistoso Substation reconfiguration
Size	
a) Voltage	138-kV
b) Capacity	System dependent
c) Points of Origin	North Loop 138 kV Substation
d) Points of Termination	Rancho Vistoso 138 kV Substation
e) Length	North Loop – Rancho Vistoso – approximately 11 miles
Routing	Reconfigure Tortolita – Rancho Vistoso line as a North Loop – Rancho Vistoso line utilizing existing 138 kV stub out of North Loop and existing 138 kV pole-line along Tangerine Rd.
Purpose	Required to meet reliability criteria.
Date	
a) Construction Start	2014
b) In-Service Date	2015
Is Certificate Necessary	No

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Santa Cruz Substation - Anklam Substation - DeMoss Petrie Substation 138kV
Size	
a) Voltage	138-kV
b) Capacity	System dependent
c) Point of Origin	Del Cerro 138 kV Substation
d) Interim Point	Future Anklam 138 kV Substation
d) Point of Termination	Tucson 138kV Substation
e) Length	Del Cerro - Anklam - approximately 5 miles Anklam - Tucson - approximately 3 miles
Routing	Anklam to tie into the existing Del Cerro – Tucson 138kV circuit with approximately two mile extension of double circuit 138 kV pole-line.
Purpose	Required to serve load at the new Anklam 138/13.8 kV Substation
Date	
a) Construction Start	2019
b) In-Service Date	2020
Is Certificate Necessary	Yes

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Loop existing Irvington Station to Vail Substation #2 line through future University of Arizona Tech Park Substation.
Size	
a) Voltage	138-kV
b) Capacity	System dependent
c) Point of Origin	Vail - Irvington Corridor
d) Point of Termination	Future U of A Tech Park Substation approximately (Sec. 28 T15S R15E)
e) Length	Approximately 2 miles of double-circuited line
Routing	Loop existing Irvington - Vail #2 line into future U of A Tech Park substation
Purpose	To provide additional electric service to the U of A Tech Park expansion and the southern part of TEP's service area.
Date	
a) Construction Start	2018
b) In-Service Date	2019
Is Certificate Necessary	Yes

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Interconnection of Tortolita – North Loop 138 kV with future TEP Marana 138 kV Substation
Size	
a) Voltage	138-kV
b) Capacity	System dependent
c) Point of Origin	Tortolita 138 kV Substation
d) Interim Point	Future Marana 138kV Substation
e) Point of Termination	North Loop 138 kV Substation
f) Length	Tortolita–Marana-North Loop – approximately 22 miles Tortolita – Marana – approximately 13 miles Marana – North Loop – approximately 9 miles
Routing	Tap the Tortolita- North Loop corridor at the Trico-Marana Rd. alignment and extend approximately 4 miles of double-circuit pole-line west across I-10 to proposed Marana substation site near Sanders Rd.
Purpose	Required to serve load at the new Marana 138/13.8 kV Substation located approximately 9 miles south-southeast of the Tortolita Substation
Date	
a) Construction Start	2017
b) In-Service Date	2018
Is Certificate Necessary	Yes

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	North Loop Substation - Rancho Vistoso Substation 138kV loop-in for new Naranja Substation
Size	
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	Ranch Vistoso 138 kV Substation
f) Length	North Loop – Naranja – approximately 6 miles Naranja – Ranch Vistoso – approximately 17 miles
Routing	Loop-in the North Loop – Rancho Vistoso line and extend approximately 3 miles of new double circuit pole-line south of Tangergine Rd. along Thornydale Rd. to the substation site
Purpose	Required to serve load at the new Naranja 138/13.8 kV Substation located in the vicinity of Thornydale Rd. and Lambert Ln.
Date	
a) Construction Start	2016
b) In-Service Date	2017
Is Certificate Necessary	Yes

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Irvington Substation - Corona Substation - South Substation 138kV
Size	
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	South 138kV Substation
f) Length	Irvington - Corona - approximately 16 miles Corona - South - approximately 4 miles
Routing	Loop-in of the existing Irvington - South 138kV circuit.
Purpose	Required to serve load at the new Corona 138/13.8 kV Substation
Date	
a) Construction Start	2017
b) In-Service Date	2018
Is Certificate Necessary	TBD

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Future Orange Grove Substation – Future East Ina Substation 138kV
Size	
a) Voltage	138-kV
b) Capacity	System dependent
c) Point of Origin	Future Orange Grove 138 kV Substation
d) Point of Termination	Future East Ina 138kV Substation
e) Length	Approximately 4 miles
Routing	Unknown
Purpose	Required to serve load at the new East Ina 138/13.8 kV Substation
Date	
a) Construction Start	2020
b) In-Service Date	2021
Is Certificate Necessary	Yes

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Future Toro Switchyard - Hartt Substation-Green Valley Substation 138kV
Size	
a) Voltage	138-kV
b) Capacity	System dependent
c) Point of Origin	Future Toro 138 kV Switchyard
d) Interim Point	Future Hartt 138 kV Substation
e) Point of Termination	Green Valley 138kV Substation
f) Length	Toro - Hartt - approximately 2.5 miles Hartt - Green Valley - approximately 4 miles
Routing	Looping the existing South - Future Toro - Green Valley 138kV circuit and drop into new station adjacent to the right-of-way approximately 1 mile south of Old Nogales Hwy and Duval Mine Rd.
Purpose	Increase load serving and reliability of existing 46/13.8 facilities near this site.
Date	
a) Construction Start	2016
b) In-Service Date	2017
Is Certificate Necessary	No

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Irvington Substation –Tucson Station #2 138 kV
Size	
a) Voltage	138-kV
b) Capacity	System Dependent
c) Point of Origin	Irvington Substation
d) Interim Point	New Kino Substation
e) Interim Point	New UA Med Substation
f) Point of Termination	Tucson Station
g) Length	Phase 1: Irvington – Kino – approximately 6 miles Kino – Tucson – approximately 5 miles Phase 2: Kino – UA Med – approximately 6 miles UA Med – Tucson – approximately 3 miles
Routing	Unknown
Purpose	To increase load serving capability and reliability in Central Tucson.
Date	
a) Construction Start	2016
b) In-Service Date	Phase 1 - 2017 Irvington Substation to new Kino Substation to

		Tucson Station 138 kV lines
	Phase 2 - 2020	Loop Kino Substation to Tucson Station Substation 138-kV line into UA Med Substation
Is Certificate Necessary	Yes	

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Interconnection of South - Midvale 138 kV circuit with future Medina, Spencer, and Raytheon 138kV substations
a) Voltage	138-kV
b) Capacity	System dependent
c) Point of Origin	Midvale 138 kV Substation
d) Interim Points	Phase 1: Future Medina 138kV Substation Phase 2: Future Spencer Substation (Sec. 2 T15S R12E) Phase 3 : Future Raytheon 138 kV Substation
e) Termination Point	South 138kV Substation
f) Length	Phase 1: Midvale-Medina - approximately 5 miles Phase 2: Midvale-Spencer approximately 8 miles of double-circuit 138 kV Phase 3: Medina - Raytheon - approximately 3 miles Raytheon - South - approximately 8 miles
Routing	Phase 1: Medina Substation will be adjacent to existing Midvale - South 138kV circuit Phase 2: West of Midvale Substation along Valencia Road, then north on Spencer Road alignment. Phase 3: Raytheon Substation will be adjacent to existing Midvale - South 138kV circuit

Purpose	Phase 1: Required to serve load at the new Medina 138 kV Substation Phase 2: To provide additional electrical service to the far western portion of TEP's service area and to reinforce the local distribution system. Phase 3: Required to serve load at the new Raytheon 138 kV Substation
Date	
a) Construction Start	Phase 1: 2018 Phase 2: 2019 Phase 3: 2020
b) In-Service Date	Phase 1: 2019 Phase 2: 2020 Phase 3: 2021
Is Certificate Necessary	Phase 1: No Phase 2: TBD (dependent upon use of Federal and/or Tohono r/w) Phase 3: No

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Rancho Vistoso – La Canada 138kV Line Reconductor
Size	
a) Voltage	138-kV
b) Capacity	System Dependent
c) Point of Origin	Rancho Vistoso Substation
d) Point of Termination	La Canada Substation
e) Length	Approximately 4.5 Miles
Routing	Existing
Purpose	To increase TEP load serving capability.
Date	
a) Construction Start	TBD
b) In-Service Date	TBD
Is Certificate Necessary	No

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Los Reales - Vail 138kV Line Reconductor
Size	
a) Voltage	138-kV
b) Capacity	System Dependent
c) Point of Origin	Los Reales Substation
d) Point of Termination	Vail Substation
e) Length	Approximately 8 Miles
Routing	Existing
Purpose	To increase TEP load serving capability.
Date	
a) Construction Start	TBD
b) In-Service Date	TBD
Is Certificate Necessary	No

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	North East Loop - Rillito 138kV Line Reconductor
Size	
a) Voltage	138-kV
b) Capacity	System Dependent
c) Point of Origin	North East Loop Substation
d) Point of Termination	Rillito Substation
e) Length	Approximately 5 Miles
Routing	Existing
Purpose	To increase TEP load serving capability.
Date	
a) Construction Start	TBD
b) In-Service Date	TBD
Is Certificate Necessary	No

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Irvington – Robert Bills-Wilmot 138kV Line Reconductor
Size	
a) Voltage	138-kV
b) Capacity	System Dependent
c) Point of Origin	Irvington Substation
d) Point of Termination	Robert Bills-Wilmot Substation
e) Length	Approximately 11 Miles
Routing	Existing
Purpose	To increase TEP load serving capability.
Date	
a) Construction Start	TBD
b) In-Service Date	TBD
Is Certificate Necessary	No

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	Los Reales - Pantano 138kV Line Reconductor
Size	
a) Voltage	138-kV
b) Capacity	System Dependent
c) Point of Origin	Los Reales Substation
d) Point of Termination	Pantano Substation
e) Length	Approximately 9 Miles
Routing	Existing
Purpose	To increase TEP load serving capability.
Date	
a) Construction Start	TBD
b) In-Service Date	TBD
Is Certificate Necessary	No

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	DeMoss Petrie - North East Loop 138kV Line Reconductor
Size	
a) Voltage	138-kV
b) Capacity	System Dependent
c) Point of Origin	DeMoss Petrie Substation
d) Point of Termination	North East Substation
e) Length	Approximately 6 Miles
Routing	Existing
Purpose	To increase TEP load serving capability.
Date	
a) Construction Start	TBD
b) In-Service Date	TBD
Is Certificate Necessary	No

TUCSON ELECTRIC POWER COMPANY

10 YEAR PLAN

TRANSMISSION FACILITIES

Line Designation	North Loop – Rillito 138kV Line Reconductor
Size	
a) Voltage	138-kV
b) Capacity	System Dependent
c) Point of Origin	North Loop Substation
d) Point of Termination	Rillito Substation
e) Length	Approximately 11 Miles
Routing	Existing
Purpose	To increase TEP load serving capability.
Date	
a) Construction Start	TBD
b) In-Service Date	TBD
Is Certificate Necessary	No

A UniSource Energy Company

TEP

A STUDY OF SIMULTANEOUS IMPORT LIMIT (SIL) RELIABILITY MUST-RUN GENERATION (RMR) MAXIMUM LOAD SERVING CAPABILITY (MLSC)

Prepared for:
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Utilities Division
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EXECUTIVE SUMMARY

Power flow simulations show the Study System is reliable and is capable of serving all load within the specified TEP Study area. Table 2A and Table 2B depict the 2014 and 2021 metric values (1) **SIL**, (2) **MLSC, (3) RMR** for the 2012 ACC Biannual Transmission Assessment (7th BTA).

Table 2A: 2013 Load Serving Analysis for TEP Study Area

year	TEP Study System Forecasted Peak[1]	Study System Load (MW)	Metric	Metric Value (MW)	Limiting Element	Limiting Outage	TEP Study System Generation Dispatch	
							Station	Dispatch
2014	2,533	2,345	SIL	2,392	North Loop - DMP 138kV circuit #1	North Loop - Rillito 138kV ckt #1 & North Loop - West Ina 138kV ckt #1	N/A	N/A
		2,820	MLSC	2,820	North Loop - DMP 138kV circuit #1	North Loop - Rillito 138kV ckt #1 & North Loop - West Ina 138kV ckt #1	ALL within study area	551MW
		2,533	RMR	294	N/A	N/A	SUNDT #3 SUNDT #2 SUNDT #1 DMP CT#1	100MW 75MW 75MW 44MW

1 - TEP Study Loads include a 5% load margin

Table 2B: 2021 Load Serving Analysis for TEP Study Area

year	TEP Study System Forecasted Peak[1]	Study System Load (MW)	Metric	Metric Value (MW)	Limiting Element	Limiting Outage	TEP Study System Generation Dispatch	
							Station	Dispatch
2021	2,880	2,504	SIL	2,575	VAIL - TECHPARK 138kV circuit #1	PINALWES - SOUTH345kV #1 & VAIL - SOUTH 345kV #1	N/A	N/A
		3,079	MLSC	3,079	NL. EXP - NARANJA 138kV circuit #1	North Loop - Rillito 138kV ckt #1 & North Loop - West Ina 138kV ckt #1	ALL within study area	551MW
		2,880	RMR	338	VAIL - TECHPARK 138kV circuit #1	PINALWES - SOUTH345kV #1 & VAIL - SOUTH 345kV #1	SUNDT #3 SUNDT #2 SUNDT #1 DMP CT#1 SUNDTCT#1 SUNDTCT#2	100MW 75MW 75MW 44MW 22MW 22MW

1 - TEP Study Loads include a 5% load margin

SIL: The transmission system's simultaneous import limit (SIL) for each local constrained area is established for contingencies studied with no local generation in operation.
MLSC: The maximum load serving capability (MLSC) of the local system is established by operating all local units at capacity, less local reserve requirements. The local MLSC equals to the SIL when there is no local generation.
RMR: The required must-run (RMR) generation are those resources located within a load pocket that, during some portions of the year, are required to serve that portion of the local load that cannot be served by local transmission.

An RMR condition exists **in** 2014 **and 2021 e**xpected emissions due to this RMR requirement can be seen in Table 3A below and expect annual generation cost for running this generation case be seen in Table 3B.

Table 3A: RMR Environmental Output Estimates for 2014 and 2021

2014 RMR Environmental Output	Estimated SO2	Estimated NOx	Estimated PM	Estimated CO2
Sundt Steam Gas (lbs)	14	4,683	123	2,777,523
Gas Turbines (lbs)	39	1,906	606	7,613,591
Sundt Steam Coal (lbs)	85,275	45,665	795	21,559,354

2021 RMR Environmental Output	Estimated SO2	Estimated NOx	Estimated PM	Estimated CO2
Sundt Steam Gas (lbs)	125	41,744	1,095	24,758,736
Gas Turbines (lbs)	262	12,921	4,105	51,609,511
Sundt Steam Coal (lbs)	369,224	197,719	3,442	93,347,417

Table 3B: Annual RMR Cost Estimates for 2014 and 2021

year	TEP Study System Forecasted Peak[1]	Study System Load (MW)	Metric	Metric Value (MW)	TEP Study System Generation Dispatch		Annual Incremental RMR Generation Cost Estimate
					Station	Dispatch	
2014	2,533	2,533	RMR	294	SUNDT #3 SUNDT #2 SUNDT #1 DMP CT#1	100MW 75MW 75MW 44MW	$186,774
2021	2,880	2,880	RMR	338	SUNDT #3 SUNDT #2 SUNDT #1 DMP CT#1 SUNDTCT#1 SUNDTCT#2	100MW 75MW 75MW 44MW 22MW 22MW	$1,188,526

An RMR condition exists in 2014 and 2021 therefore a comparative analysis of alternatives was done that compared:

(1) the annual RMR generation cost (Table 3B)

(2) the cost of new facilities that eliminate the RMR condition (Table 5)

Table 5: 2014 & 2021 Comparative Analysis

RMR Mitigation Option		2014	2021
1	Annual Incremental RMR Generation Cost Estimate	$186,774	$1,188,526
2	RMR New Facilities Mitigation Cost Estimate	$12,500,000	$132,200,000

The new facilities mitigation costs are planning feasibility level estimates, they are conceptual, without the benefit of engineering design or location-specific appraisals. These estimates allow for uncertainty of procurement cost, land requirements, permitting, terrain, and physical construction cost.

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INTRODUCTION

In order to assess Arizona's electrical power systems in accordance with applicable NERC Reliability Standards and WECC System Performance Criteria, the Arizona Corporation Commission requires Arizona utilities to study their systems at SIL, MLSC, and at peak forecast operating conditions every two years. Normal operating study procedures are followed for the SIL, MLSC, and peak forecast operating condition evaluations. Common corridor outages and extreme contingencies (all transformers at any one EHV substation) are studied as well. RMR generation is determined for the peak forecast loads. Utilities are also required to provide information on the environmental outputs, generators and generation sensitivity, transmission import limit, and alternative solutions.

PURPOSE

The purpose of this RMR Study is to determine the following six components as specified in the ACC 2nd Biennial Transmission Assessment 2002-2011, Section 7.2 "Reliability Must-Run Generation (RMR) Requirements":

1. **Simultaneous Import Limit (SIL)** – The maximum import level that the Study System can reliably support when no local generation is dispatched.
2. **Maximum Load Serving Capability (MLSC)** – The maximum load level that the Study System can reliably support when all local generation is dispatched.
3. **Reliability Must Run (RMR) conditions** – RMR conditions exist only when the Study System cannot reliably support its projected peak load without the dispatch of some or all local generation, (i.e., when forecasted load exceeds the SIL).
4. **System Generator List** – TEP local generators available for dispatch. (Appendix A)
5. **Effectiveness of New Facilities** – A new facilities effectiveness evaluation is to be done only if new facilities (transmission or generation) are needed to mitigate RMR conditions in the Study System.
6. **Comparative Analysis of Alternatives** – Comparative analysis of alternatives is to be done only if such alternatives are needed to mitigate RMR conditions in the Study System.

Common corridor outages (three or more elements) and extreme contingencies were evaluated for consequences. These contingencies can be seen in APPENDIX C2.

Included in this report are the cost estimates for:

(1) Running TEP local generation for RMR;

(2) Upgrading the system such that RMR generation could be eliminated.

Information regarding environmental emissions, generation output, generation sensitivity, transmission import limit, and alternative solutions is also provided.

Figure 1 – Study System for TEP (2014 & 2021)

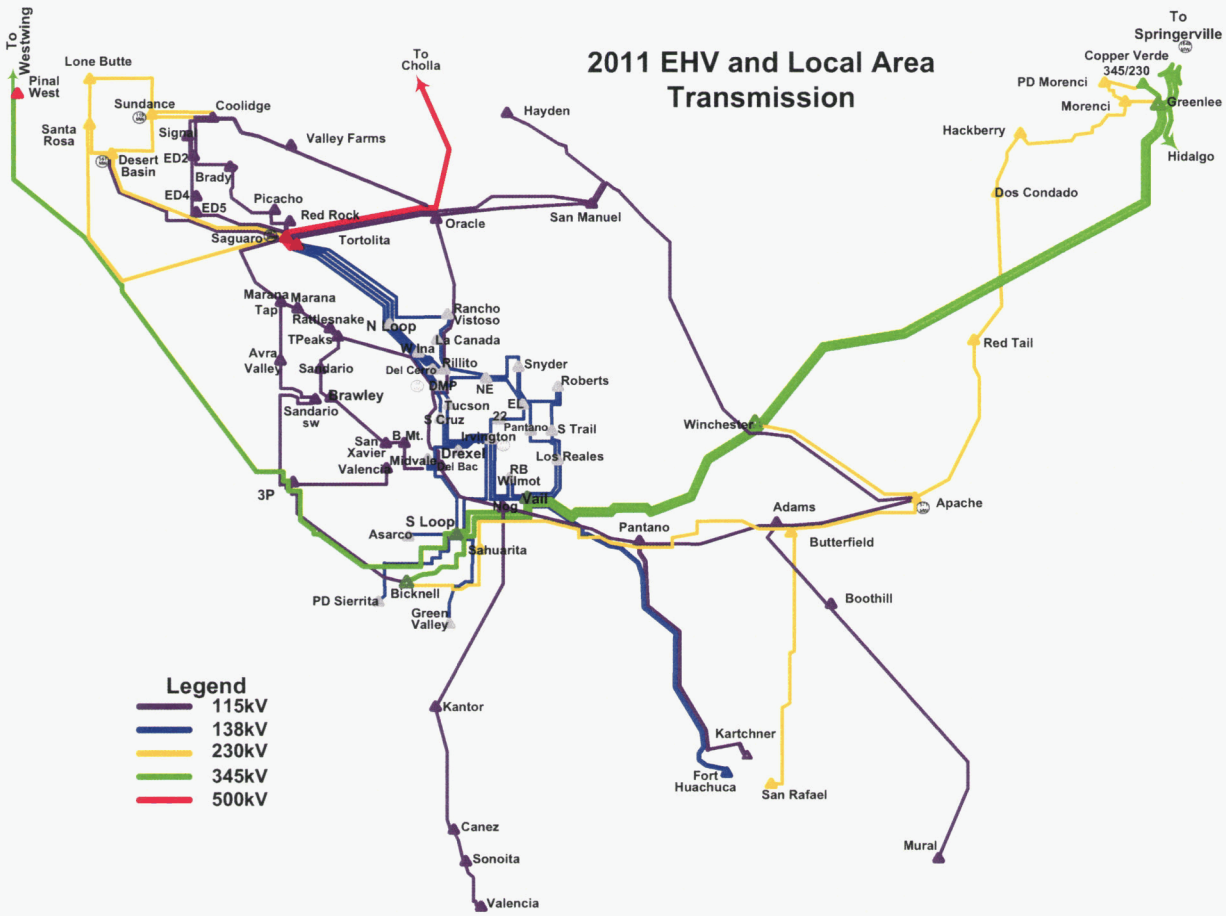
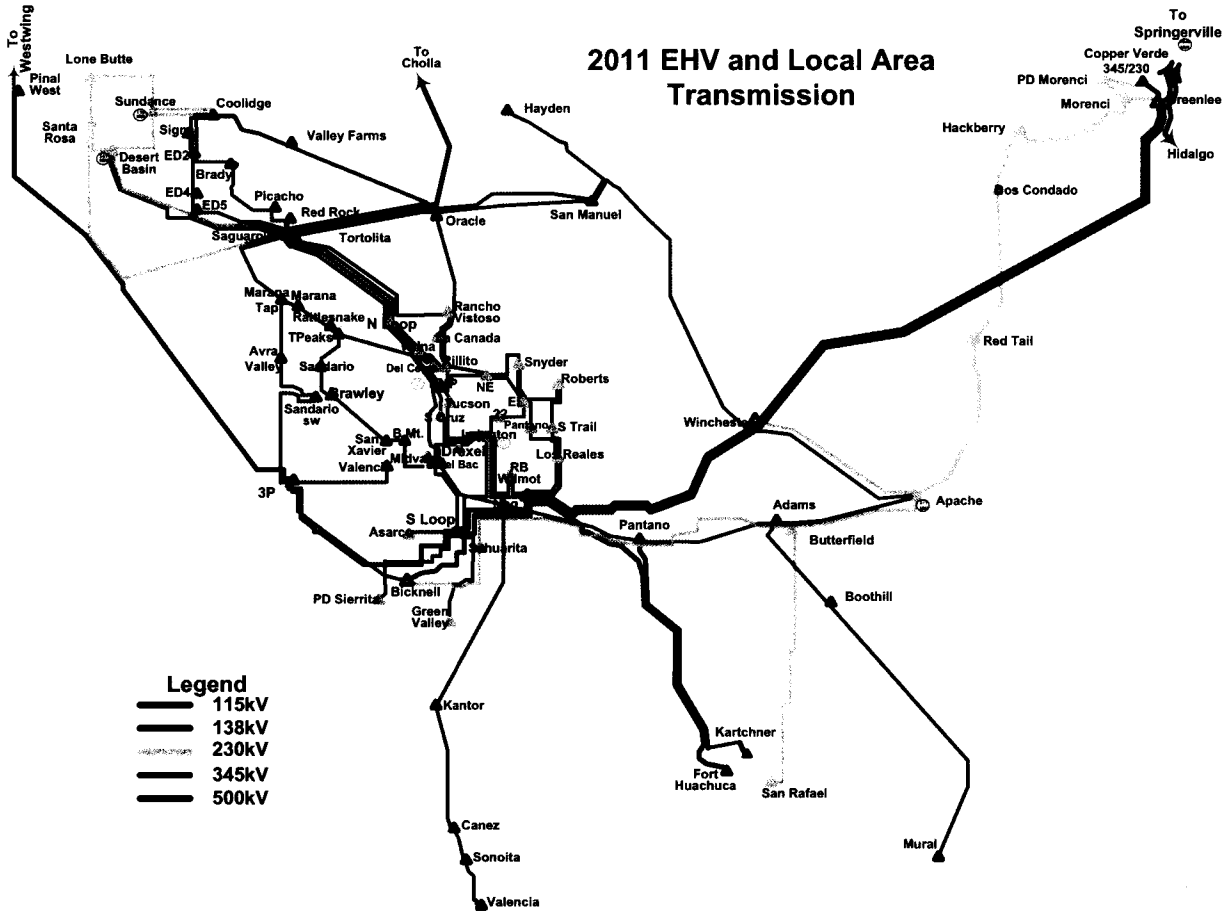


Figure 1 – Study System for TEP (2014 & 2021)



STUDY BASE CASE DESCRIPTION AND ASSUMPTIONS

The WECC base cases 2014hs3sa and 2021hs1a were modified in coordination with other utilities within Arizona. Forecasted peak loads within the study system were incorporated into the starting case for each of the years 2014 & 2021. APPENDIX B summarizes the peak load projections for the study system.

TEP planned facilities are documented in the Ten-Year Plan. However, anticipated major system changes between 2012 and 2014 are as follows.

- Pinal West – Pinal Central 500 kV line
- Pinal Central – Tortolita 500 kV line
- Expansion of the Tortolita substation to include a 500 kV yard and the 3rd 500/138 kV transformer normally in service.
- Vail 345/138kV transformer # 3
- New Rosemont load with a new radial 138kV transmission line from a new switching station with STATCOM on TEP's South to Green Valley 138 kV transmission line
- Craycroft-Barril 138/13.8kV distribution substation
- Orange Grove 138/13.8 kV distribution substation
- Harrison 138/13.8kV distribution substation
- Duval Clear 138 kV switchyard
- TEP 138 kV line between Duval Clear and Canoa Ranch substations
- Reconductor Northeast – Rillito 138 kV line

The following elements are significant changes between 2015 and 2021.

- New Vail – Nogales 138 kV line and conversion of the UNSE system to 138 kV
- Spencer 138/13.8 kV distribution substation
- Hartt 138/13.8 kV distribution substation
- TechPark 138/13.8 kV distribution substation
- Marana 138/13.8 kV distribution substation
- Naranja 138/13.8 kV distribution substation
- Kino 138/13.8 kV distribution substation
- Corona 138/13.8 kV distribution substation
- Anklam 138/13.8 kV distribution substation
- East Ina 138/13.8 kV distribution substation
- Medina 138/13.8 kV distribution substation
- Raytheon 138/13.8 kV distribution substation
- UA Med 138/13.8 kV distribution substation

- Reconductor North Loop – Rillito 138 kV line
- Reconductor DMP – Northeast 138 kV line
- Reconductor Rancho Vistoso – La Canada 138 kV line
- Reconductor Los Reales – Vail 138 kV line
- Reconductor Irvington – Robert Bills - Wilmot 138 kV line
- Reconductor Los Reales – Pantano 138 kV line
- TEP 138 kV line between Irvington and Tucson substations

TEP's import transmission elements are identical for 2014 and 2021. The Pinal Central to Tortolita 500 kV line in-service date is 2014. The following are the TEP study system import points:

(1) Tortolita 500/138kV transformer T1

(2) Tortolita 500/138kV transformer T2

(3) Tortolita 500/138kV transformer T3

(4) Vail 345/138kV transformer T1

(5) Vail 345/138kV transformer T2

(6) Vail 345/138kV transformer T3 (in service 2012)

(7) South 345/138kV transformer T2

(8) South 345/138kV transformer T3

STUDY METHODOLOGY

The following analysis was performed to determine the following metrics:

Simultaneous Import Limit (SIL)

To develop a Simultaneous Import Limit (SIL) case, the Starting Case was modified so that all TEP local generation within the study system were taken off-line. Replacement generation required to supply TEP load was scheduled from elsewhere within Arizona as necessary. Study system loads, except generating station auxiliary loads and known mining loads, were scaled by the same percentage with the load power factors held constant. The change in study system loads due to scaling to determine SIL were accounted for by turning down or increasing generation in the system external to the study system as appropriate. Under these SIL conditions, the study system load was continually scaled in 25MW increments, as the limit was approached, until any EHV or HV thermal, voltage or solution constraints were found for contingencies simulated. (See APPENDIX C – power flow contingencies)

Required Must Run (RMR)

TEP designs its transmission system assuming that all but one of its four steam units at the Sundt Generating Station, as well as 44 MW on the combustion turbine at its DeMoss Petrie station, are dispatched during on-peak conditions. Sundt steam unit 4 is not dispatched so its VAr response is not available for system regulation. This introduces a minimum RMR value of 294 MW on the local TEP system. If additional generation were required to meet RMR, additional local generation would be dispatched in the following order:

(1) Sundt/Irvington CT #1	(4) N. Loop CT #2
(2) Sundt/Irvington CT #2	(5) N. Loop CT #3
(3) N. Loop CT #1	(6) N. Loop CT #4

Table 1: TEP Local Generation Dispatch Order

The TEP local generation capability is shown in APPENDIX A – study system generator list.

For an RMR condition the following environmental outputs will be reported on an annual basis: Sulfur dioxide (SO_2), Nitrogen oxide (NO_x), Carbon dioxide (CO_2), Particulate matter (PM).

Maximum Load Serving Capability (MLSC)

The Starting Case was modified so that all generators within the Study System were on-line at maximum dispatch in order to develop a MLSC case. An equal amount of generation was reduced elsewhere in Arizona to offset the increased study system load. Loads within the study system, with the exception of any generating station auxiliary loads and known mining loads, were scaled by the same percentage with the load power factors held constant. Under these MLSC conditions, the study system load was continually scaled in 25MW increments and then scaled to the nearest MW, as limits were approached, and thermal, voltage or solution constraints were found for the simulated contingencies. (See APPENDIX C – power flow contingencies)

Effectiveness of New Facilities

If an RMR condition exists, the need for new transmission facilities will be identified based on criteria violations that drive the SIL of the study system. Simulations were run on 2014 and 2021 cases to ensure that any identified new facilities in fact mitigate criteria violations ensure that the SIL is adequate for the forecasted peak load in each of those years. The purpose of the identified new facilities is to eliminate the RMR condition.

Comparative Analysis of Alternatives

If an RMR condition exists, a comparative analysis of alternatives was done to compare:

(1) the cost of new facilities that eliminate the RMR condition
(2) the annual RMR generation cost

EVALUATION CRITERIA

Specific studies to be conducted and their evaluation criteria are discussed below.

Power Flow Analysis

Power flow analysis was performed to determine SIL, to identify any RMR requirement, to determine MLSC, and to confirm the effectiveness of new facilities to eliminate RMR generation.

The contingencies simulated will include:

- All single transmission circuits and transformers with low-side voltage greater than 100 kV within the study area (Category B).
- All Tie Lines to adjacent systems connecting immediately outside the study area (Category B).
- TEP Category C contingencies
- TEP TOLS-activating Category D contingencies

See APPENDIX C – Power Flow Contingencies, for the list of contingencies to be evaluated.

The NERC TPL performance measures and the WECC System Performance Criteria along with the following criteria will be used to determine SIL, RMR, MLSC, and effectiveness of new facilities. The power flow analysis related evaluation criteria that will be used are summarized below:

- Pre-contingency EHV bus voltages within the TEP Planning Authority (PA) Area between 1.03 per unit and 1.04 per unit, as possible.
    - Exceptions for fictitious buses, i.e., VAIL2
    - TEP to review prior to contingency analysis
- Pre-contingency HV bus voltages within the TEP Planning Authority (PA) Area between 1.0145 per unit and 1.0250 per unit, as possible.
    - Exceptions for HV voltages in the vicinity of Vail, South and Tortolita
    - TEP to review prior to contingency analysis
- Pre-contingency TEP 138 kV average bus voltage between 1.0210 per unit and 1.0235 per unit.
- Post-contingency TEP 138 kV average bus voltage between 0.98 per unit and 1.05 per unit.
- Pre-contingency 100kV – 500kV bus voltage outside of the TEP PA Area must be between 0.95 per unit and 1.05 per unit.
- Maximum voltage deviation allowed at all buses under contingency conditions will be 5% for all Category B contingencies and 10% for Category C contingencies.
- Pre-disturbance loading to remain within continuous ratings of all equipment and

line conductors

- Post-disturbance loading to remain within emergency ratings of all equipment and line conductors.

The system will be simulated with static VAr devices active, but load tap changing out-of-service, phase shifters blocked and area interchange disabled.

Post-Transient Voltage Stability

To assure post-transient voltage stability, the total Study System load in the SIL, MLSC and RMR cases include a 5% load margin per the WECC Voltage Stability Guide for Category B contingencies. Then these margin cases were evaluated for a solution for a NERC Category A as well as NERC Category B and C contingencies. If the limiting condition for the determined metric is a solution issue the load will be scaled back to demonstrate an appropriate post-transient voltage stability margin per the WECC Voltage Stability Guide.

RESULTS

SIL, RMR and MLSC RESULTS

Power flow simulations show the Study System is reliable and is capable of serving all load within the specified TEP Study area. Table 2A and Table 2B depict the 2014 and 2021 metric values (1) **SIL**, (2) **MLSC** and **(3) RMR** for the 2012 ACC Biennial Transmission Assessment (7th BTA). The 294 MW RMR value in 2014 is a specified level of generation within the TEP load pocket for which TEP designs its HV and EHV transmission system.

Table 2A: 2013 Load Serving Analysis for TEP Study Area

year	TEP Study System Forecasted Peak[1]	Study System Load (MW)	Metric	Metric Value (MW)	Limiting Element	Limiting Outage	TEP Study System Generation Dispatch	
							Station	Dispatch
2014	2,533	2,345	SIL	2,392	North Loop - DMP 138kV circuit #1	North Loop - Rillito 138kV ckt #1 & North Loop - West Ina 138kV ckt #1	N/A	N/A
		2,820	MLSC	2,820	North Loop - DMP 138kV circuit #1	North Loop - Rillito 138kV ckt #1 & North Loop - West Ina 138kV ckt #1	ALL within study area	551MW
		2,533	RMR	294	N/A	N/A	SUNDT #3 SUNDT #2 SUNDT #1 DMP CT#1	100MW 75MW 75MW 44MW

1 - TEP Study Loads include a 5% load margin

Table 2B: 2021 Load Serving Analysis for TEP Study Area

year	TEP Study System Forecasted Peak[1]	Study System Load (MW)	Metric	Metric Value (MW)	Limiting Element	Limiting Outage	TEP Study System Generation Dispatch	
							Station	Dispatch
2021	2,880	2,504	SIL	2,575	VAIL - TECHPARK 138kV circuit #1	PINALWES - SOUTH345kV #1 & VAIL - SOUTH 345kV #1	N/A	N/A
		3,079	MLSC	3,079	NL. EXP - NARANJA 138kV circuit #1	North Loop - Rillito 138kV ckt #1 & North Loop - West Ina 138kV ckt #1	ALL within study area	551MW
		2,880	RMR	338	VAIL - TECHPARK 138kV circuit #1	PINALWES - SOUTH345kV #1 & VAIL - SOUTH 345kV #1	SUNDT #3 SUNDT #2 SUNDT #1 DMP CT#1 SUNDTCT#1 SUNDTCT#2	100MW 75MW 75MW 44MW 22MW 22MW

1 - TEP Study Loads include a 5% load margin

Expected emissions due to the RMR condition that exist in 2014 and 2021 can be seen in Table 3A and 3B below and associated annual generation cost may be seen in Table 3C.

Table 3A: RMR Environmental Output Estimates for 2014

2014 RMR Environmental Output	Estimated SO2	Estimated NOx	Estimated PM	Estimated CO2
Sundt Steam Gas (lbs)	14	4,683	123	2,777,523
Gas Turbines (lbs)	39	1,906	606	7,613,591
Sundt Steam Coal (lbs)	85,275	45,665	795	21,559,354

Table 3B: RMR Environmental Output Estimates for 2021

2021 RMR Environmental Output	Estimated SO2	Estimated NOx	Estimated PM	Estimated CO2
Sundt Steam Gas (lbs)	125	41,744	1,095	24,758,736
Gas Turbines (lbs)	262	12,921	4,105	51,609,511
Sundt Steam Coal (lbs)	369,224	197,719	3,442	93,347,417

Table 3C: Annual RMR Cost Estimates for 2014 and 2021

year	TEP Study System Forecasted Peak[1]	Study System Load (MW)	Metric	Metric Value (MW)	TEP Study System Generation Dispatch		Annual Incremental RMR Generation Cost Estimate
					Station	Dispatch	
2014	2,533	2,533	RMR	294	SUNDT #3 SUNDT #2 SUNDT #1 DMP CT#1	100MW 75MW 75MW 44MW	$186,774
2021	2,880	2,880	RMR	338	SUNDT #3 SUNDT #2 SUNDT #1 DMP CT#1 SUNDTCT#1 SUNDTCT#2	100MW 75MW 75MW 44MW 22MW 22MW	$1,188,526

Effectiveness of New Facilities

An RMR condition exists **in** 2014 **and 2021** therefore the need for new facilities was identified based on criteria violations that drive the SIL of the study system. Table 4A and 4B below is the new facilities requirements for 2014 and 2021, respectively that mitigate criteria violations ensuring that the SIL is adequate for the forecasted peak load.

Table 4A: 2013 New Facility Requirements for TEP Study Area

year	TEP Study System Forecasted Peak[1]	New Facilities	Critical Outage	Criteria Violations Mitigated	RMR New Facilities Mitigation Cost Estimate	Total Cost
2014	2,533	(1) NEW Bicknell 345/230kV transformer	SPRINGR - VAIL 345kV & WINCHSTR - VAIL 345kV	Bicknell 345/230kV Overload	$4.6M	$12.5M
		(2) uprate NL. EXP - DMP 138kV ckt from 418MVA to 460MVA	NL. EXP - RILLITO 13kV & NL. EXP - WESTINA 138kV	NL. EXP - DMP 138kV Overload	$7.9M	

1 - TEP Study System Forecasted Peak includes a 5% load margin

Table 4B: 2021 New Facility Requirements for TEP Study Area

year	TEP Study System Forecasted Peak[1]	New Facilities	Critical Outage	Criteria Violations Mitigated	RMR New Facilities Mitigation Cost Estimate	Total Cost
2021	2,880	(1) New WINCHESTER - VAIL 345kV ckt #2	WINCHSTR - VAIL 345kV & SPRINGR - VAIL 345kV	Solution Issues	$116.8M	$132.2M
		(2) Inclusion of following outages in TOLS: (a) SPRINGR - VAIL & WILLOW - WINCHSTR (b) VAIL T2 & WILLOW - WINCHSTR	(a) SPRINGR - VAIL & WILLOW - WINCHSTR (b) VAIL T2 & WILLOW - WINCHSTR	Solution Issues	$200k	
		(3) uprate VAIL - TECHPARK 138kV ckt from 418MVA to 487.4MVA	VAIL - LOSREALS 138kV & VAIL - RBWILMONT 138kV	VAIL - TECHPARK 138kV Overload	$2.8M	
		(4) uprate TECHPARK - IRVNGTN 138kV ckt from 418MVA to 467.8MVA	VAIL - LOSREALS 138kV & VAIL - RBWILMONT 138kV	TECHPARK - IRVNGTN 138kV Overload	$3.4M	
		(5) uprate NL. EXP - NARANJA 138kV ckt from 426.4MVA to 471.2MVA	NL. EXP - RILLITO 138kV & NL. EXP - WESTINA 138kV	NL. EXP - NARANJA 138kV Overload	$110K	
		(6) uprate NL. EXP - DMP 138kV ckt from 418MVA to 430.6MVA	PINALWES - SOUTH 345kV & VAIL T2 with 500MW BOWIE TRIP and AVRA - SNDARIO 115kV	NL. EXP - DMP 138kV ckt Overload	$7.9M	
		(7) uprate NL. EXP - WESTINA 138kV ckt from 382MVA to 428.6MVA	PINALWES - SOUTH 345kV & VAIL T2 with 500MW BOWIE TRIP and AVRA - SNDARIO 115kV	NL. EXP - WESTINA 138kV ckt Overload	$380K	

		(8) uprate RILLITO - NE. LOOP 138kV ckt from 369.8MVA to 438.2MVA	PINALWES - SOUTH 345kV & VAIL T2 with 500MW BOWIE TRIP and AVRA - SNDARIO 115kV	RILLITO - NE. LOOP 138kV ckt Overload	$400K	
		(9) uprate WESTINA - DELCERRO 138kV ckt from 311MVA to 331.5MVA	PINALWES - SOUTH 345kV & VAIL T2 with 500MW BOWIE TRIP and AVRA - SNDARIO 115kV	WESTINA - DELCERRO 138kV ckt Overload	$230K	

1 - TEP Study System Forecasted Peak includes a 5% load margin

The new facilities mitigation costs are planning feasibility level estimates, they are conceptual, without the benefit of engineering design or location-specific appraisals. These estimates allow for uncertainty of procurement cost, land requirements, permitting, terrain, and physical construction cost.

Comparative Analysis of Alternatives

An RMR condition exists in 2014 and 2021 therefore a comparative analysis of alternatives was done that compared:

(1) the annual RMR generation cost

(2) the cost of new facilities that eliminate the RMR condition

Table 5: 2014 & 2021 Comparative Analysis

RMR Mitigation Option		2014	2021
1	Annual Incremental RMR Generation Cost Estimate	$186,774	$1,188,526
2	RMR New Facilities Mitigation Cost Estimate	$12,500,000	$132,200,000

APPENDIX A – Study System Generator List

Base Loadable	Min Dispatch (MW)	Max Dispatch (MW)	Qmin (MVAR)	Qmax (MVAR)
Sundt ST Unit #1	10	75	-15	80
Sundt ST Unit #2	10	75	-15	80
Sundt ST Unit #3	15	105	-15	65
Sundt ST Unit #4	20	125	-30	120
DMP CT #1	11	44	-10	47
Peaking	**Min Dispatch (MW)**	**Max Dispatch (MW)**	**Qmin (MVAR)**	**Qmax (MVAR)**
Sundt/Irvington CT #1	22	22	-10	15
Sundt/Irvington CT #2	22	22	-10	15
N. Loop CT #1	22	22	-10	15
N. Loop CT #2	22	22	-10	15
N. Loop CT #3	22	22	-10	15
N. Loop CT #4	17	17	-5	5

APPENDIX B – TEP February 2011 Load Forecast

Year	TEP Study Area Load Forecast (MW)				
	TEP Load Forecast	SWTC Load Forecast[1]	Rosemont Load Forecast[2]	UNS Santa Cruz Load Forecast[3]	TOTAL
2011	2,349	17.58			2,367
2012	2,387	20.35			2,407
2013	2,430	23.11			2,453
2014	2,388	25.88	118.80		2,533
2015	2,424	28.65	118.80	80.90	2,652
2016	2,453	31.41	118.80	81.40	2,685
2017	2,485	34.18	118.80	81.80	2,720
2018	2,514	36.94	118.80	82.30	2,752
2019	2,546	39.71	118.80	82.80	2,787
2020	2,582	42.47	118.80	83.30	2,827
2021	2,632	45.24	118.80	83.80	2,880

1 - SWTC Loads are located at the TEP N. Loop 138kV Substation, values for 2014 and 2021 were seen in the models and the rest of the yearly are estimated based on those known value

2 - Rosemont Load is scheduled to be in-service in 2014.

3 - UNS Santa Cruz 115 kV to 138 kV conversion scheduled to be in-service by 2015.

APPENDIX C – Power Flow Contingencies

```
COMM Contingency List created by cont_list.p
COMM Parameters to create contingency List
COMM    ZONE 160
COMM    345 - 500 kV
COMM    Tie Lines Included: YES
COMM    OOS elements included: YES
COMM    Single and Double Contingencies
COMM " "
COMM " "
CATEGORY A
RUN 0
CATEGORY BN
LINE 14000 "CHOLLA  " 500.0 14004 "SAGUARO " 500.0  1
RUN 1
CATEGORY BN
LINE 15080 "PINAL_C " 500.0 16000 "TORTOLIT" 500.0 1
RUN 2
CATEGORY BN
LINE 14004 "SAGUARO " 500.0 16001 "TORTLIT2" 500.0 1
RUN 3
CATEGORY BN
LINE 14004 "SAGUARO " 500.0 16000 "TORTOLIT" 500.0 1
RUN 4
CATEGORY BN
LINE 14004 "SAGUARO " 500.0 16000 "TORTOLIT" 500.0 2
RUN 5
CATEGORY BN
LINE 17005 "BICKNELL" 345.0 16105 "VAIL    " 345.0 1
RUN 6
CATEGORY BN
LINE 17010 "GREEN-SW" 345.0 16101 "GREENLEE" 345.0 1
RUN 7
CATEGORY BN
LINE 16101 "GREENLEE" 345.0 16900 "COPPERVR" 345.0 1
RUN 8
CATEGORY BN
LINE 16101 "GREENLEE" 345.0 16112 "WILLOW  " 345.0 1
RUN 9
CATEGORY BN
LINE 16101 "GREENLEE" 345.0 16109 "WINCHSTR" 345.0 1
RUN 10
CATEGORY BN
LINE 11080 "HIDALGO " 345.0 16101 "GREENLEE" 345.0 1
RUN 11
```

```
CATEGORY BN
LINE 16102 "MCKINLEY" 345.0 16104 "SPRINGR " 345.0 1
RUN 12
CATEGORY BN
LINE 16102 "MCKINLEY" 345.0 16104 "SPRINGR " 345.0 2
RUN 13
CATEGORY BN
LINE 16114 "PINALWES" 345.0 16103 "SOUTH   " 345.0 1
RUN 14
CATEGORY BN
LINE 10292 "SAN_JUAN" 345.0 16102 "MCKINLEY" 345.0 1
RUN 15
CATEGORY BN
LINE 10292 "SAN_JUAN" 345.0 16102 "MCKINLEY" 345.0 2
RUN 16
CATEGORY BN
LINE 16104 "SPRINGR " 345.0 16100 "CORONADO" 345.0 1
RUN 17
CATEGORY BN
LINE 16104 "SPRINGR " 345.0 16101 "GREENLEE" 345.0 1
RUN 18
CATEGORY BN
LINE 16104 "SPRINGR " 345.0 11093 "LUNA    " 345.0 1
RUN 19
CATEGORY BN
LINE 16104 "SPRINGR " 345.0 16106 "VAIL2   " 345.0 1
RUN 20
CATEGORY BN
LINE 16105 "VAIL    " 345.0 16106 "VAIL2   " 345.0 1
RUN 21
CATEGORY BN
LINE 16105 "VAIL    " 345.0 16103 "SOUTH   " 345.0 1
RUN 22
CATEGORY BN
LINE 16107 "WESTWING" 345.0 16114 "PINALWES" 345.0 1
RUN 23
CATEGORY BN
LINE 16112 "WILLOW  " 345.0 16111 "BOWIE   " 345.0 1
RUN 24
CATEGORY BN
LINE 16112 "WILLOW  " 345.0 16111 "BOWIE   " 345.0 2
RUN 25
CATEGORY BN
LINE 16109 "WINCHSTR" 345.0 16105 "VAIL    " 345.0 1
RUN 26
CATEGORY BN
LINE 16109 "WINCHSTR" 345.0 16112 "WILLOW  " 345.0 1
RUN 27
```

CATEGORY BN
LINE 16243 "CIENEGA " 138.0 16213 "S.TRAIL " 138.0 1
RUN 28
CATEGORY BN
LINE 16238 "CORONA " 138.0 16204 "IRVNGTN " 138.0 1
RUN 29
CATEGORY BN
LINE 16238 "CORONA " 138.0 16216 "SOUTH " 138.0 1
RUN 30
CATEGORY BN
LINE 16239 "CRYCROFT" 138.0 16208 "NE.LOOP " 138.0 1
RUN 31
CATEGORY BN
LINE 16229 "DELCERRO" 138.0 16221 "WESTINA " 138.0 1
RUN 32
CATEGORY BN
LINE 16200 "DMP " 138.0 16253 "ANKLAM " 138.0 1
RUN 33
CATEGORY BN
LINE 16200 "DMP " 138.0 16999 "NL. EXP " 138.0 1
RUN 34
CATEGORY BN
LINE 16200 "DMP " 138.0 16207 "N. LOOP " 138.0 1
RUN 35
CATEGORY BN
LINE 16200 "DMP " 138.0 16208 "NE.LOOP " 138.0 1
RUN 36
CATEGORY BN
LINE 16200 "DMP " 138.0 16214 "SN.CRUZ " 138.0 1
RUN 37
CATEGORY BN
LINE 16200 "DMP " 138.0 16218 "TUCSON " 138.0 1
RUN 38
CATEGORY BN
LINE 16201 "DREXEL " 138.0 16204 "IRVNGTN " 138.0 1
RUN 39
CATEGORY BN
LINE 16201 "DREXEL " 138.0 16206 "MIDVALE " 138.0 1
RUN 40
CATEGORY BN
LINE 16202 "E. LOOP " 138.0 16247 "HARRISON" 138.0 1
RUN 41
CATEGORY BN
LINE 16202 "E. LOOP " 138.0 16208 "NE.LOOP " 138.0 1
RUN 42
CATEGORY BN
LINE 16202 "E. LOOP " 138.0 16224 "PANTANO " 138.0 1
RUN 43

CATEGORY BN
LINE 16202 "E. LOOP " 138.0 16211 "ROBERTS " 138.0 1
RUN 44
CATEGORY BN
LINE 16232 "GREENVLY" 138.0 16227 "CANOARCH" 138.0 1
RUN 45
CATEGORY BN
LINE 16242 "HARTT " 138.0 16232 "GREENVLY" 138.0 1
RUN 46
CATEGORY BN
LINE 16204 "IRVNGTN " 138.0 16246 "KINO " 138.0 1
RUN 47
CATEGORY BN
LINE 16204 "IRVNGTN " 138.0 16261 "IRV_RING" 138.0 1
RUN 48
CATEGORY BN
LINE 16261 "IRV_RING" 138.0 16216 "SOUTH " 138.0 1
RUN 49
CATEGORY BN
LINE 16204 "IRVNGTN " 138.0 16233 "TECHPARK" 138.0 1
RUN 50
CATEGORY BN
LINE 16204 "IRVNGTN " 138.0 16218 "TUCSON " 138.0 1
RUN 51
CATEGORY BN
LINE 16204 "IRVNGTN " 138.0 16220 "VAIL " 138.0 2
RUN 52
CATEGORY BN
LINE 16223 "LOSREALS" 138.0 16220 "VAIL " 138.0 1
RUN 53
CATEGORY BN
LINE 16206 "MIDVALE " 138.0 16257 "RAYTHEON" 138.0 1
RUN 54
CATEGORY BN
LINE 16206 "MIDVALE " 138.0 16235 "SPNCER " 138.0 1
RUN 55
CATEGORY BN
LINE 16207 "N. LOOP " 138.0 16999 "NL. EXP " 138.0 1
RUN 56
CATEGORY BN
LINE 16999 "NL. EXP " 138.0 16244 "MARANA " 138.0 1
RUN 57
CATEGORY BN
LINE 16207 "N. LOOP " 138.0 16209 "RANVISTO" 138.0 1
RUN 58
CATEGORY BN
LINE 16999 "NL. EXP " 138.0 16210 "RILLITO " 138.0 1
RUN 59

CATEGORY BN
LINE 16999 "NL. EXP " 138.0 16221 "WESTINA " 138.0 1
RUN 60
CATEGORY BN
LINE 16208 "NE.LOOP " 138.0 16298 "NELP_SVC" 138.0 1
RUN 61
CATEGORY BN
LINE 16208 "NE.LOOP " 138.0 16210 "RILLITO " 138.0 1
RUN 62
CATEGORY BN
LINE 16251 "ORNGROVE" 138.0 16254 "EASTINA " 138.0 1
RUN 63
CATEGORY BN
LINE 16251 "ORNGROVE" 138.0 16205 "LACANADA" 138.0 1
RUN 64
CATEGORY BN
LINE 16251 "ORNGROVE" 138.0 16210 "RILLITO " 138.0 1
RUN 65
CATEGORY BN
LINE 16224 "PANTANO " 138.0 16223 "LOSREALS" 138.0 1
RUN 66
CATEGORY BN
LINE 16209 "RANVISTO" 138.0 16205 "LACANADA" 138.0 1
RUN 67
CATEGORY BN
LINE 16209 "RANVISTO" 138.0 16245 "NARANJA " 138.0 1
RUN 68
CATEGORY BN
LINE 16209 "RANVISTO" 138.0 16226 "CATALINA" 138.0 1
RUN 69
CATEGORY BN
LINE 16257 "RAYTHEON" 138.0 16255 "MEDINA " 138.0 1
RUN 70
CATEGORY BN
LINE 16222 "RBWILMOT" 138.0 16204 "IRVNGTN " 138.0 1
RUN 71
CATEGORY BN
LINE 16222 "RBWILMOT" 138.0 16220 "VAIL   " 138.0 1
RUN 72
CATEGORY BN
LINE 16210 "RILLITO " 138.0 16205 "LACANADA" 138.0 1
RUN 73
CATEGORY BN
LINE 16211 "ROBERTS " 138.0 16247 "HARRISON" 138.0 1
RUN 74
CATEGORY BN
LINE 16213 "S.TRAIL " 138.0 16211 "ROBERTS " 138.0 1
RUN 75

CATEGORY BN
LINE 16214 "SN.CRUZ " 138.0 16253 "ANKLAM " 138.0 1
RUN 76
CATEGORY BN
LINE 16214 "SN.CRUZ " 138.0 16204 "IRVNGTN " 138.0 1
RUN 77
CATEGORY BN
LINE 16215 "SNYDER " 138.0 16239 "CRYCROFT" 138.0 1
RUN 78
CATEGORY BN
LINE 16215 "SNYDER " 138.0 16202 "E. LOOP " 138.0 1
RUN 79
CATEGORY BN
LINE 16215 "SNYDER " 138.0 16208 "NE.LOOP " 138.0 1
RUN 80
CATEGORY BN
LINE 16216 "SOUTH   " 138.0 16225 "ASARCO " 138.0 1
RUN 81
CATEGORY BN
LINE 16216 "SOUTH   " 138.0 16228 "CYPRUS " 138.0 1
RUN 82
CATEGORY BN
LINE 16216 "SOUTH   " 138.0 16232 "GREENVLY" 138.0 1
RUN 83
CATEGORY BN
LINE 16216 "SOUTH   " 138.0 16242 "HARTT   " 138.0 1
RUN 84
CATEGORY BN
LINE 16216 "SOUTH   " 138.0 16255 "MEDINA " 138.0 1
RUN 85
CATEGORY BN
LINE 16216 "SOUTH   " 138.0 16206 "MIDVALE " 138.0 1
RUN 86
CATEGORY BN
LINE 16216 "SOUTH   " 138.0 16257 "RAYTHEON" 138.0 1
RUN 87
CATEGORY BN
LINE 16216 "SOUTH   " 138.0 16235 "SPNCER " 138.0 1
RUN 88
CATEGORY BN
LINE 16235 "SPNCER " 138.0 16255 "MEDINA " 138.0 1
RUN 89
CATEGORY BN
LINE 16233 "TECHPARK" 138.0 16220 "VAIL   " 138.0 1
RUN 90
CATEGORY BN
LINE 16217 "TORTOLIT" 138.0 16244 "MARANA " 138.0 1
RUN 91

CATEGORY BN
LINE 16217 "TORTOLIT" 138.0 16207 "N. LOOP " 138.0 4
RUN 92
CATEGORY BN
LINE 16217 "TORTOLIT" 138.0 16999 "NL. EXP " 138.0 4
RUN 93
CATEGORY BN
LINE 16217 "TORTOLIT" 138.0 16999 "NL. EXP " 138.0 3
RUN 94
CATEGORY BN
LINE 16217 "TORTOLIT" 138.0 16999 "NL. EXP " 138.0 2
RUN 95
CATEGORY BN
LINE 16217 "TORTOLIT" 138.0 16999 "NL. EXP " 138.0 1
RUN 96
CATEGORY BN
LINE 16217 "TORTOLIT" 138.0 16207 "N. LOOP " 138.0 3
RUN 97
CATEGORY BN
LINE 16217 "TORTOLIT" 138.0 16209 "RANVISTO" 138.0 1
RUN 98
CATEGORY BN
LINE 16218 "TUCSON " 138.0 16229 "DELCERRO" 138.0 1
RUN 99
CATEGORY BN
LINE 16218 "TUCSON " 138.0 16246 "KINO   " 138.0 1
RUN 100
CATEGORY BN
LINE 16219 "TWNTYSEC" 138.0 16202 "E. LOOP " 138.0 1
RUN 101
CATEGORY BN
LINE 16219 "TWNTYSEC" 138.0 16204 "IRVNGTN " 138.0 1
RUN 102
CATEGORY BN
LINE 16256 "UA MED " 138.0 16246 "KINO   " 138.0 1
RUN 103
CATEGORY BN
LINE 16256 "UA MED " 138.0 16218 "TUCSON " 138.0 1
RUN 104
CATEGORY BN
LINE 16220 "VAIL   " 138.0 16243 "CIENEGA " 138.0 1
RUN 105
CATEGORY BN
LINE 16220 "VAIL   " 138.0 16230 "FT.HUACH" 138.0 1
RUN 106
CATEGORY BN
LINE 16220 "VAIL   " 138.0 16719 "NOGALES " 138.0 1
RUN 107

CATEGORY BN
LINE 16220 "VAIL " 138.0 16213 "S.TRAIL " 138.0 1
RUN 108
CATEGORY BN
LINE 16920 "ROSEMONT" 138.0 16259 "GRTRVL " 138.0 1
RUN 109
CATEGORY BN
LINE 16258 "SANRIT_S" 138.0 16232 "GREENVLY" 138.0 1
RUN 110
CATEGORY BN
LINE 16258 "SANRIT_S" 138.0 16242 "HARTT " 138.0 1
RUN 111
CATEGORY BN
LINE 16258 "SANRIT_S" 138.0 16920 "ROSEMONT" 138.0 1
RUN 112
CATEGORY BN
LINE 16216 "SOUTH " 138.0 16258 "SANRIT_S" 138.0 1
RUN 113
CATEGORY BN
LINE 16217 "TORTOLIT" 138.0 16245 "NARANJA " 138.0 1
RUN 114
CATEGORY BN
LINE 16216 "SOUTH " 138.0 16260 "CLEAR " 138.0 1
RUN 115
CATEGORY BN
LINE 16227 "CANOARCH" 138.0 16260 "CLEAR " 138.0 1
RUN 116
CATEGORY BN
LINE 16228 "CYPRUS " 138.0 16260 "CLEAR " 138.0 1
RUN 117
CATEGORY BN
XFMR 15001 "CORONADO" 500.0 16100 "CORONADO" 345.0 1
RUN 118
CATEGORY BN
XFMR 15001 "CORONADO" 500.0 16100 "CORONADO" 345.0 2
RUN 119
CATEGORY BN
XFMR 15088 "PINAL_W " 500.0 16114 "PINALWES" 345.0 1
RUN 120
CATEGORY BN
XFMR 16000 "TORTOLIT" 500.0 16115 "TORTOLIT" 345.0 1
RUN 121
CATEGORY BN
XFMR 14005 "WESTWING" 500.0 16107 "WESTWING" 345.0 1
RUN 122
CATEGORY BN
XFMR 16111 "BOWIE " 345.0 16530 "BOWIE_G1" 18.0 1
RUN 123

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CATEGORY BN
XFMR 16111 "BOWIE   " 345.0 16531 "BOWIE_G2"  18.0 1
RUN 124
CATEGORY BN
XFMR 16111 "BOWIE   " 345.0 16533 "BOWIE_G3"  18.0 1
RUN 125
CATEGORY BN
XFMR 16111 "BOWIE   " 345.0 16534 "BOWIE_G4"  18.0 1
RUN 126
CATEGORY BN
XFMR 16111 "BOWIE   " 345.0 16532 "BOWIE_S1"  18.0 1
RUN 127
CATEGORY BN
XFMR 16111 "BOWIE   " 345.0 16535 "BOWIE_S2"  18.0 1
RUN 128
CATEGORY BN
XFMR 16102 "MCKINLEY" 345.0 10382 "YAHTAHEY" 115.0 1
RUN 129
CATEGORY BN
XFMR 16103 "SOUTH   " 345.0 16216 "SOUTH   " 138.0 1
RUN 130
CATEGORY BN
XFMR 16103 "SOUTH   " 345.0 16216 "SOUTH   " 138.0 2
RUN 131
CATEGORY BN
XFMR 16104 "SPRINGR " 345.0 16500 "SPR GEN1"  19.0 1
RUN 132
CATEGORY BN
XFMR 16104 "SPRINGR " 345.0 16501 "SPR GEN2"  19.0 1
RUN 133
CATEGORY BN
XFMR 16104 "SPRINGR " 345.0 16518 "SPR GEN3"  21.0 1
RUN 134
CATEGORY BN
XFMR 16104 "SPRINGR " 345.0 16519 "SPR GEN4"  21.0 1
RUN 135
CATEGORY BN
XFMR 16105 "VAIL    " 345.0 16220 "VAIL    " 138.0 1
RUN 136
CATEGORY BN
XFMR 16105 "VAIL    " 345.0 16220 "VAIL    " 138.0 2
RUN 137
CATEGORY BN
XFMR 16106 "VAIL2   " 345.0 16220 "VAIL    " 138.0 1
RUN 138
CATEGORY BN
XFMR 16106 "VAIL2   " 345.0 16220 "VAIL    " 138.0 2
RUN 139
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CATEGORY BN
XFMR 16109 "WINCHSTR" 345.0 17105 "WINCHSTR" 230.0 1
RUN 140
CATEGORY BN
XFMR 16109 "WINCHSTR" 345.0 17105 "WINCHSTR" 230.0 2
RUN 141
CATEGORY BN
XFMR 16333 "IRVMID3 " 138.0 16204 "IRVNGTN " 138.0 1
RUN 142
CATEGORY BN
XFMR 16334 "IRVMID4 " 138.0 16204 "IRVNGTN " 138.0 1
RUN 143
CATEGORY BN
XFMR 16235 "SPNCER  " 138.0 16414 "SPNCER  " 115.0 1
RUN 144
CATEGORY BN
XFMR 16217 "TORTOLIT" 138.0 14356 "SAG.EAST" 115.0 1
RUN 145
CATEGORY BN
XFMR 16217 "TORTOLIT" 138.0 14357 "SAG.WEST" 115.0 1
RUN 146
CATEGORY BN
XFMR 16217 "TORTOLIT" 138.0 16001 "TORTLIT2" 500.0 1
RUN 147
CATEGORY BN
XFMR 16217 "TORTOLIT" 138.0 16000 "TORTOLIT" 500.0 1
RUN 148
CATEGORY BN
XFMR 16217 "TORTOLIT" 138.0 16000 "TORTOLIT" 500.0 2
RUN 149
CATEGORY BN
XFMR 16217 "TORTOLIT" 138.0 16000 "TORTOLIT" 500.0 3
RUN 150
CATEGORY BN
XFMR 16217 "TORTOLIT" 138.0 16000 "TORTOLIT" 500.0 4
RUN 151
CATEGORY BN
XFMR 16503 "SUNDTGE4"  18.0 16334 "IRVMID4 " 138.0 1
RUN 152
CATEGORY BN
XFMR 16514 "DMPCCT#1"  13.8 16200 "DMP     " 138.0 1
RUN 153
CATEGORY BN
XFMR 16504 "SUNDTCT "  13.8 16204 "IRVNGTN " 138.0 1
RUN 154
CATEGORY BN
XFMR 16509 "SUNDTGE3"  13.8 16333 "IRVMID3 " 138.0 1
RUN 155
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CATEGORY BN
COMM *"NL EXP SHUNT"
SHNT 16999 "NL. EXP " 138.0    0 "      "  0.0 b1
SHNT 16999 "NL. EXP " 138.0    0 "      "  0.0 b2
RUN 156
CATEGORY BN
COMM *"NL SHUNT"
SHNT 16207 "N. LOOP " 138.0    0 "      "  0.0 b1
SHNT 16207 "N. LOOP " 138.0    0 "      "  0.0 b2
RUN 157
CATEGORY BN
COMM *"RI SHUNT"
SHNT 16210 "RILLITO " 138.0    0 "      "  0.0 b1
SHNT 16210 "RILLITO " 138.0    0 "      "  0.0 b2
RUN 158
CATEGORY BN
COMM *"WI SHUNT"
SHNT 16221 "WESTINA " 138.0    0 "      "  0.0 b1
SHNT 16221 "WESTINA " 138.0    0 "      "  0.0 b2
RUN 159
CATEGORY BN
COMM *"SO SHUNT"
SHNT 16216 "SOUTH   " 138.0    0 "      "  0.0 b1
SHNT 16216 "SOUTH   " 138.0    0 "      "  0.0 b2
RUN 160
CATEGORY BN
COMM *"EL SHUNT"
SHNT 16202 "E. LOOP " 138.0    0 "      "  0.0 b1
SHNT 16202 "E. LOOP " 138.0    0 "      "  0.0 b2
SHNT 16202 "E. LOOP " 138.0    0 "      "  0.0 b3
RUN 161
CATEGORY BN
COMM *"SPVL SEC 1 SHUNT"
SHNT 16104 "SPRINGR " 345.0 16106 "VAIL2   " 345.0  1 t 1
RUN 162
CATEGORY BN
COMM *"SPVL SEC 3 SHUNT"
LSHNT 16104 "SPRINGR " 345.0 16106 "VAIL2   " 345.0  1 t 3
RUN 163
CATEGORY BN
COMM *"SPLU SHUNT 1"
SHNT 16104 "SPRINGR " 345.0 11093 "LUNA    " 345.0 f1
RUN 164
CATEGORY BN
COMM *"SPLU SHUNT 2"
SHNT 16104 "SPRINGR " 345.0 11093 "LUNA    " 345.0 f2
RUN 165
CATEGORY CT
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COMM * "IRV BUS DIF"
BUS 16204 "IRVNGTN " 138.0
RUN 166
CATEGORY CT
COMM * "VLT2/VL-CAPS"
XFMR 16106 "VAIL2   " 345.0 16220 "VAIL    " 138.0 1
SHNT 16220 "VAIL    " 138.0    0 "       "  0.0 b1
SHNT 16220 "VAIL    " 138.0    0 "       "  0.0 b2
SHNT 16220 "VAIL    " 138.0    0 "       "  0.0 b3
SHNT 16220 "VAIL    " 138.0    0 "       "  0.0 b4
SHNT 16220 "VAIL    " 138.0    0 "       "  0.0 b5
RUN 167
CATEGORY CN
LINE 15080 "PINAL_C " 500.0 16000 "TORTOLIT" 500.0 1
XFMR 16217 "TORTOLIT" 138.0 16001 "TORTLIT2" 500.0 1
RUN 168
CATEGORY CN
LINE 15080 "PINAL_C " 500.0 16000 "TORTOLIT" 500.0 1
XFMR 16217 "TORTOLIT" 138.0 16000 "TORTOLIT" 500.0 1
RUN 169
CATEGORY CN
LINE 15080 "PINAL_C " 500.0 16000 "TORTOLIT" 500.0 1
XFMR 16217 "TORTOLIT" 138.0 16000 "TORTOLIT" 500.0 2
RUN 170
CATEGORY CN
LINE 15080 "PINAL_C " 500.0 16000 "TORTOLIT" 500.0 1
XFMR 16217 "TORTOLIT" 138.0 16000 "TORTOLIT" 500.0 3
RUN 171
CATEGORY CN
LINE 15080 "PINAL_C " 500.0 16000 "TORTOLIT" 500.0 1
XFMR 16217 "TORTOLIT" 138.0 16000 "TORTOLIT" 500.0 4
RUN 172
CATEGORY CT
LINE 14004 "SAGUARO " 500.0 16001 "TORTLIT2" 500.0 1
LINE 14004 "SAGUARO " 500.0 16000 "TORTOLIT" 500.0 1
RUN 173
CATEGORY CN
LINE 14004 "SAGUARO " 500.0 16001 "TORTLIT2" 500.0 1
LINE 14004 "SAGUARO " 500.0 16000 "TORTOLIT" 500.0 2
RUN 174
CATEGORY CN
LINE 14004 "SAGUARO " 500.0 16001 "TORTLIT2" 500.0 1
XFMR 16217 "TORTOLIT" 138.0 16001 "TORTLIT2" 500.0 1
RUN 175
CATEGORY CT
LINE 14004 "SAGUARO " 500.0 16000 "TORTOLIT" 500.0 1
LINE 14004 "SAGUARO " 500.0 16000 "TORTOLIT" 500.0 2
RUN 176
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CATEGORY CN
LINE 14004 "SAGUARO " 500.0 16000 "TORTOLIT" 500.0 1
XFMR 16217 "TORTOLIT" 138.0 16000 "TORTOLIT" 500.0 1
RUN 177
CATEGORY CN
LINE 14004 "SAGUARO " 500.0 16000 "TORTOLIT" 500.0 2
XFMR 16217 "TORTOLIT" 138.0 16000 "TORTOLIT" 500.0 2
RUN 178
CATEGORY CN
LINE 16101 "GREENLEE" 345.0 16900 "COPPERVR" 345.0 1
LINE 16101 "GREENLEE" 345.0 16112 "WILLOW " 345.0 1
RUN 179
CATEGORY CN
LINE 16101 "GREENLEE" 345.0 16900 "COPPERVR" 345.0 1
LINE 16101 "GREENLEE" 345.0 16109 "WINCHSTR" 345.0 1
RUN 180
CATEGORY CN
LINE 16101 "GREENLEE" 345.0 16900 "COPPERVR" 345.0 1
LINE 16104 "SPRINGR " 345.0 16101 "GREENLEE" 345.0 1
RUN 181
CATEGORY CT
LINE 16101 "GREENLEE" 345.0 16109 "WINCHSTR" 345.0 1
LINE 16104 "SPRINGR " 345.0 16106 "VAIL2   " 345.0 1
RUN 182
CATEGORY CT
LINE 16101 "GREENLEE" 345.0 16109 "WINCHSTR" 345.0 1
XFMR 16106 "VAIL2   " 345.0 16220 "VAIL   " 138.0 1
RUN 183
CATEGORY CT
LINE 16101 "GREENLEE" 345.0 16109 "WINCHSTR" 345.0 1
LINE 16109 "WINCHSTR" 345.0 16105 "VAIL   " 345.0 1
RUN 184
CATEGORY CT
LINE 16114 "PINALWES" 345.0 16103 "SOUTH   " 345.0 1
LINE 16105 "VAIL   " 345.0 16103 "SOUTH   " 345.0 1
RUN 185
CATEGORY CN
LINE 16114 "PINALWES" 345.0 16103 "SOUTH   " 345.0 1
XFMR 14005 "WESTWING" 500.0 16107 "WESTWING" 345.0 1
RUN 186
CATEGORY CN
LINE 16101 "GREENLEE" 345.0 16112 "WILLOW " 345.0 1
LINE 16104 "SPRINGR " 345.0 16101 "GREENLEE" 345.0 1
RUN 187
CATEGORY CN
LINE 16101 "GREENLEE" 345.0 16112 "WILLOW " 345.0 1
LINE 16104 "SPRINGR " 345.0 16106 "VAIL2   " 345.0 1
RUN 188

CATEGORY CN
LINE 16101 "GREENLEE" 345.0 16112 "WILLOW " 345.0 1
XFMR 16106 "VAIL2 " 345.0 16220 "VAIL " 138.0 1
RUN 189
CATEGORY CN
LINE 16101 "GREENLEE" 345.0 16112 "WILLOW " 345.0 1
LINE 16112 "WILLOW " 345.0 16111 "BOWIE " 345.0 1
RUN 190
CATEGORY CN
LINE 16101 "GREENLEE" 345.0 16112 "WILLOW " 345.0 1
LINE 16112 "WILLOW " 345.0 16111 "BOWIE " 345.0 2
RUN 191
CATEGORY CN
LINE 16101 "GREENLEE" 345.0 16112 "WILLOW " 345.0 1
LINE 16109 "WINCHSTR" 345.0 16112 "WILLOW " 345.0 1
RUN 192
CATEGORY CN
LINE 16101 "GREENLEE" 345.0 16109 "WINCHSTR" 345.0 1
LINE 16104 "SPRINGR " 345.0 16101 "GREENLEE" 345.0 1
RUN 193
CATEGORY CN
LINE 16101 "GREENLEE" 345.0 16109 "WINCHSTR" 345.0 1
LINE 16105 "VAIL " 345.0 16106 "VAIL2 " 345.0 1
RUN 194
CATEGORY CN
LINE 16101 "GREENLEE" 345.0 16109 "WINCHSTR" 345.0 1
XFMR 16109 "WINCHSTR" 345.0 17105 "WINCHSTR" 230.0 2
RUN 195
CATEGORY CN
LINE 16102 "MCKINLEY" 345.0 16104 "SPRINGR " 345.0 1
LINE 16102 "MCKINLEY" 345.0 16104 "SPRINGR " 345.0 2
RUN 196
CATEGORY CN
LINE 16102 "MCKINLEY" 345.0 16104 "SPRINGR " 345.0 1
LINE 10292 "SAN_JUAN" 345.0 16102 "MCKINLEY" 345.0 1
RUN 197
CATEGORY CN
LINE 16102 "MCKINLEY" 345.0 16104 "SPRINGR " 345.0 1
LINE 16104 "SPRINGR " 345.0 16100 "CORONADO" 345.0 1
RUN 198
CATEGORY CN
LINE 16102 "MCKINLEY" 345.0 16104 "SPRINGR " 345.0 2
LINE 10292 "SAN_JUAN" 345.0 16102 "MCKINLEY" 345.0 2
RUN 199
CATEGORY CN
LINE 16114 "PINALWES" 345.0 16103 "SOUTH " 345.0 1
LINE 16107 "WESTWING" 345.0 16114 "PINALWES" 345.0 1
RUN 200

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CATEGORY CT
LINE 16114 "PINALWES" 345.0 16103 "SOUTH   " 345.0 1
XFMR 15088 "PINAL_W " 500.0 16114 "PINALWES" 345.0 1
RUN 201
CATEGORY CT
LINE 16114 "PINALWES" 345.0 16103 "SOUTH   " 345.0 1
XFMR 16103 "SOUTH   " 345.0 16216 "SOUTH   " 138.0 2
RUN 202
CATEGORY CN
LINE 10292 "SAN_JUAN" 345.0 16102 "MCKINLEY" 345.0 1
LINE 10292 "SAN_JUAN" 345.0 16102 "MCKINLEY" 345.0 2
RUN 203
CATEGORY CT
LINE 16104 "SPRINGR " 345.0 16101 "GREENLEE" 345.0 1
LINE 16104 "SPRINGR " 345.0 16106 "VAIL2   " 345.0 1
RUN 204
CATEGORY CN
LINE 16104 "SPRINGR " 345.0 16101 "GREENLEE" 345.0 1
LINE 16105 "VAIL    " 345.0 16106 "VAIL2   " 345.0 1
RUN 205
CATEGORY CN
LINE 16104 "SPRINGR " 345.0 16101 "GREENLEE" 345.0 1
XFMR 16104 "SPRINGR " 345.0 16518 "SPR GEN3"  21.0 1
RUN 206
CATEGORY CT
LINE 16104 "SPRINGR " 345.0 16101 "GREENLEE" 345.0 1
XFMR 16106 "VAIL2   " 345.0 16220 "VAIL    " 138.0 1
RUN 207
CATEGORY CN
LINE 16104 "SPRINGR " 345.0 11093 "LUNA    " 345.0 1
XFMR 16104 "SPRINGR " 345.0 16500 "SPR GEN1"  19.0 1
RUN 208
CATEGORY CT
LINE 16104 "SPRINGR " 345.0 16106 "VAIL2   " 345.0 1
LINE 16109 "WINCHSTR" 345.0 16105 "VAIL    " 345.0 1
RUN 209
CATEGORY CN
LINE 16104 "SPRINGR " 345.0 16106 "VAIL2   " 345.0 1
LINE 16109 "WINCHSTR" 345.0 16112 "WILLOW  " 345.0 1
RUN 210
CATEGORY CT
LINE 16104 "SPRINGR " 345.0 16106 "VAIL2   " 345.0 1
XFMR 16104 "SPRINGR " 345.0 16501 "SPR GEN2"  19.0 1
RUN 211
CATEGORY CN
LINE 16104 "SPRINGR " 345.0 16106 "VAIL2   " 345.0 1
XFMR 16106 "VAIL2   " 345.0 16220 "VAIL    " 138.0 1
RUN 212
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CATEGORY CN
LINE 16104 "SPRINGR " 345.0 16106 "VAIL2   " 345.0 1
XFMR 16106 "VAIL2   " 345.0 16220 "VAIL    " 138.0 2
RUN 213
CATEGORY CN
LINE 16105 "VAIL    " 345.0 16103 "SOUTH   " 345.0 1
XFMR 16103 "SOUTH   " 345.0 16216 "SOUTH   " 138.0 1
RUN 214
CATEGORY CN
LINE 16105 "VAIL    " 345.0 16103 "SOUTH   " 345.0 1
XFMR 16106 "VAIL2   " 345.0 16220 "VAIL    " 138.0 2
RUN 215
CATEGORY CT
LINE 16107 "WESTWING" 345.0 16114 "PINALWES" 345.0 1
XFMR 15088 "PINAL_W " 500.0 16114 "PINALWES" 345.0 1
RUN 216
CATEGORY CN
LINE 16112 "WILLOW  " 345.0 16111 "BOWIE   " 345.0 1
LINE 16112 "WILLOW  " 345.0 16111 "BOWIE   " 345.0 2
RUN 217
CATEGORY CN
LINE 16112 "WILLOW  " 345.0 16111 "BOWIE   " 345.0 1
XFMR 16111 "BOWIE   " 345.0 16530 "BOWIE_G1"  18.0 1
RUN 218
CATEGORY CN
LINE 16112 "WILLOW  " 345.0 16111 "BOWIE   " 345.0 1
XFMR 16111 "BOWIE   " 345.0 16531 "BOWIE_G2"  18.0 1
RUN 219
CATEGORY CN
LINE 16112 "WILLOW  " 345.0 16111 "BOWIE   " 345.0 1
XFMR 16111 "BOWIE   " 345.0 16533 "BOWIE_G3"  18.0 1
RUN 220
CATEGORY CN
LINE 16112 "WILLOW  " 345.0 16111 "BOWIE   " 345.0 1
XFMR 16111 "BOWIE   " 345.0 16534 "BOWIE_G4"  18.0 1
RUN 221
CATEGORY CN
LINE 16112 "WILLOW  " 345.0 16111 "BOWIE   " 345.0 1
XFMR 16111 "BOWIE   " 345.0 16532 "BOWIE_S1"  18.0 1
RUN 222
CATEGORY CN
LINE 16112 "WILLOW  " 345.0 16111 "BOWIE   " 345.0 1
XFMR 16111 "BOWIE   " 345.0 16535 "BOWIE_S2"  18.0 1
RUN 223
CATEGORY CN
LINE 16112 "WILLOW  " 345.0 16111 "BOWIE   " 345.0 2
XFMR 16111 "BOWIE   " 345.0 16530 "BOWIE_G1"  18.0 1
RUN 224
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CATEGORY CN
LINE 16112 "WILLOW  " 345.0 16111 "BOWIE   " 345.0 2
XFMR 16111 "BOWIE   " 345.0 16531 "BOWIE_G2"  18.0 1
RUN 225
CATEGORY CN
LINE 16112 "WILLOW  " 345.0 16111 "BOWIE   " 345.0 2
XFMR 16111 "BOWIE   " 345.0 16533 "BOWIE_G3"  18.0 1
RUN 226
CATEGORY CN
LINE 16112 "WILLOW  " 345.0 16111 "BOWIE   " 345.0 2
XFMR 16111 "BOWIE   " 345.0 16534 "BOWIE_G4"  18.0 1
RUN 227
CATEGORY CN
LINE 16112 "WILLOW  " 345.0 16111 "BOWIE   " 345.0 2
XFMR 16111 "BOWIE   " 345.0 16532 "BOWIE_S1"  18.0 1
RUN 228
CATEGORY CN
LINE 16112 "WILLOW  " 345.0 16111 "BOWIE   " 345.0 2
XFMR 16111 "BOWIE   " 345.0 16535 "BOWIE_S2"  18.0 1
RUN 229
CATEGORY CN
LINE 16109 "WINCHSTR" 345.0 16105 "VAIL    " 345.0 1
LINE 16109 "WINCHSTR" 345.0 16112 "WILLOW  " 345.0 1
RUN 230
CATEGORY CT
LINE 16109 "WINCHSTR" 345.0 16105 "VAIL    " 345.0 1
XFMR 16105 "VAIL    " 345.0 16220 "VAIL    " 138.0 1
RUN 231
CATEGORY CT
LINE 16109 "WINCHSTR" 345.0 16105 "VAIL    " 345.0 1
XFMR 16106 "VAIL2   " 345.0 16220 "VAIL    " 138.0 1
RUN 232
CATEGORY CN
LINE 16109 "WINCHSTR" 345.0 16112 "WILLOW  " 345.0 1
XFMR 16106 "VAIL2   " 345.0 16220 "VAIL    " 138.0 1
RUN 233
CATEGORY CN
XFMR 15001 "CORONADO" 500.0 16100 "CORONADO" 345.0 1
XFMR 15001 "CORONADO" 500.0 16100 "CORONADO" 345.0 2
RUN 234
CATEGORY CN
XFMR 16111 "BOWIE   " 345.0 16530 "BOWIE_G1"  18.0 1
XFMR 16111 "BOWIE   " 345.0 16533 "BOWIE_G3"  18.0 1
RUN 235
CATEGORY CN
XFMR 16111 "BOWIE   " 345.0 16530 "BOWIE_G1"  18.0 1
XFMR 16111 "BOWIE   " 345.0 16534 "BOWIE_G4"  18.0 1
RUN 236
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CATEGORY CN
XFMR 16111 "BOWIE   " 345.0 16530 "BOWIE_G1"  18.0 1
XFMR 16111 "BOWIE   " 345.0 16532 "BOWIE_S1"  18.0 1
RUN 237
CATEGORY CN
XFMR 16111 "BOWIE   " 345.0 16530 "BOWIE_G1"  18.0 1
XFMR 16111 "BOWIE   " 345.0 16535 "BOWIE_S2"  18.0 1
RUN 238
CATEGORY CN
XFMR 16111 "BOWIE   " 345.0 16531 "BOWIE_G2"  18.0 1
XFMR 16111 "BOWIE   " 345.0 16533 "BOWIE_G3"  18.0 1
RUN 239
CATEGORY CN
XFMR 16111 "BOWIE   " 345.0 16531 "BOWIE_G2"  18.0 1
XFMR 16111 "BOWIE   " 345.0 16534 "BOWIE_G4"  18.0 1
RUN 240
CATEGORY CN
XFMR 16111 "BOWIE   " 345.0 16531 "BOWIE_G2"  18.0 1
XFMR 16111 "BOWIE   " 345.0 16532 "BOWIE_S1"  18.0 1
RUN 241
CATEGORY CN
XFMR 16111 "BOWIE   " 345.0 16531 "BOWIE_G2"  18.0 1
XFMR 16111 "BOWIE   " 345.0 16535 "BOWIE_S2"  18.0 1
RUN 242
CATEGORY CN
XFMR 16111 "BOWIE   " 345.0 16533 "BOWIE_G3"  18.0 1
XFMR 16111 "BOWIE   " 345.0 16534 "BOWIE_G4"  18.0 1
RUN 243
CATEGORY CN
XFMR 16111 "BOWIE   " 345.0 16533 "BOWIE_G3"  18.0 1
XFMR 16111 "BOWIE   " 345.0 16532 "BOWIE_S1"  18.0 1
RUN 244
CATEGORY CN
XFMR 16111 "BOWIE   " 345.0 16533 "BOWIE_G3"  18.0 1
XFMR 16111 "BOWIE   " 345.0 16535 "BOWIE_S2"  18.0 1
RUN 245
CATEGORY CN
XFMR 16111 "BOWIE   " 345.0 16534 "BOWIE_G4"  18.0 1
XFMR 16111 "BOWIE   " 345.0 16532 "BOWIE_S1"  18.0 1
RUN 246
CATEGORY CN
XFMR 16111 "BOWIE   " 345.0 16534 "BOWIE_G4"  18.0 1
XFMR 16111 "BOWIE   " 345.0 16535 "BOWIE_S2"  18.0 1
RUN 247
CATEGORY CN
XFMR 16111 "BOWIE   " 345.0 16532 "BOWIE_S1"  18.0 1
XFMR 16111 "BOWIE   " 345.0 16535 "BOWIE_S2"  18.0 1
RUN 248
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CATEGORY CT
XFMR 15088 "PINAL_W " 500.0 16114 "PINALWES" 345.0 1
XFMR 14005 "WESTWING" 500.0 16107 "WESTWING" 345.0 1
RUN 249
CATEGORY CT
XFMR 16104 "SPRINGR " 345.0 16501 "SPR GEN2" 19.0 1
XFMR 16106 "VAIL2 " 345.0 16220 "VAIL " 138.0 1
RUN 250
CATEGORY DT
LINE 14000 "CHOLLA " 500.0 14004 "SAGUARO " 500.0 1
LINE 16104 "SPRINGR " 345.0 16106 "VAIL2 " 345.0 1
RUN 251
CATEGORY DT
LINE 14000 "CHOLLA " 500.0 14004 "SAGUARO " 500.0 1
XFMR 16106 "VAIL2 " 345.0 16220 "VAIL " 138.0 1
RUN 252
CATEGORY DT
LINE 16114 "PINALWES" 345.0 16103 "SOUTH " 345.0 1
LINE 16104 "SPRINGR " 345.0 16106 "VAIL2 " 345.0 1
RUN 253
CATEGORY DT
LINE 16114 "PINALWES" 345.0 16103 "SOUTH " 345.0 1
LINE 16109 "WINCHSTR" 345.0 16105 "VAIL " 345.0 1
RUN 254
CATEGORY DT
LINE 16114 "PINALWES" 345.0 16103 "SOUTH " 345.0 1
XFMR 16106 "VAIL2 " 345.0 16220 "VAIL " 138.0 1
RUN 255
CATEGORY DT
LINE 16104 "SPRINGR " 345.0 16106 "VAIL2 " 345.0 1
XFMR 16105 "VAIL " 345.0 16220 "VAIL " 138.0 1
RUN 256
CATEGORY DT
LINE 16109 "WINCHSTR" 345.0 16105 "VAIL " 345.0 1
XFMR 16109 "WINCHSTR" 345.0 17105 "WINCHSTR" 230.0 1
RUN 257
CATEGORY DT
XFMR 16105 "VAIL " 345.0 16220 "VAIL " 138.0 1
XFMR 16106 "VAIL2 " 345.0 16220 "VAIL " 138.0 1
RUN 258
CATEGORY CN
LINE 16109 "WINCHSTR" 345.0 16105 "VAIL " 345.0 1
LINE 16220 "VAIL " 138.0 16230 "FT.HUACH" 138.0 1
RUN 259
CATEGORY CN
LINE 16243 "CIENEGA " 138.0 16213 "S.TRAIL " 138.0 1
LINE 16223 "LOSREALS" 138.0 16220 "VAIL " 138.0 1
RUN 260

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CATEGORY CN
LINE 16243 "CIENEGA " 138.0 16213 "S.TRAIL " 138.0 1
LINE 16224 "PANTANO " 138.0 16223 "LOSREALS" 138.0 1
RUN 261
CATEGORY CN
LINE 16243 "CIENEGA " 138.0 16213 "S.TRAIL " 138.0 1
LINE 16220 "VAIL    " 138.0 16243 "CIENEGA " 138.0 1
RUN 262
CATEGORY CN
LINE 16238 "CORONA  " 138.0 16204 "IRVNGTN " 138.0 1
LINE 16238 "CORONA  " 138.0 16216 "SOUTH   " 138.0 1
RUN 263
CATEGORY CN
LINE 16238 "CORONA  " 138.0 16204 "IRVNGTN " 138.0 1
LINE 16204 "IRVNGTN " 138.0 16233 "TECHPARK" 138.0 1
RUN 264
CATEGORY CN
LINE 16238 "CORONA  " 138.0 16204 "IRVNGTN " 138.0 1
LINE 16204 "IRVNGTN " 138.0 16220 "VAIL    " 138.0 2
RUN 265
CATEGORY CN
LINE 16238 "CORONA  " 138.0 16204 "IRVNGTN " 138.0 1
LINE 16222 "RBWILMOT" 138.0 16204 "IRVNGTN " 138.0 1
RUN 266
CATEGORY CN
LINE 16238 "CORONA  " 138.0 16216 "SOUTH   " 138.0 1
LINE 16204 "IRVNGTN " 138.0 16233 "TECHPARK" 138.0 1
RUN 267
CATEGORY CN
LINE 16238 "CORONA  " 138.0 16216 "SOUTH   " 138.0 1
LINE 16204 "IRVNGTN " 138.0 16220 "VAIL    " 138.0 2
RUN 268
CATEGORY CN
LINE 16238 "CORONA  " 138.0 16216 "SOUTH   " 138.0 1
LINE 16222 "RBWILMOT" 138.0 16204 "IRVNGTN " 138.0 1
RUN 269
CATEGORY CN
LINE 16239 "CRYCROFT" 138.0 16208 "NE.LOOP " 138.0 1
LINE 16202 "E. LOOP " 138.0 16208 "NE.LOOP " 138.0 1
RUN 270
CATEGORY CN
LINE 16239 "CRYCROFT" 138.0 16208 "NE.LOOP " 138.0 1
LINE 16215 "SNYDER  " 138.0 16239 "CRYCROFT" 138.0 1
RUN 271
CATEGORY CN
LINE 16229 "DELCERRO" 138.0 16221 "WESTINA " 138.0 1
LINE 16200 "DMP     " 138.0 16207 "N. LOOP " 138.0 1
RUN 272
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CATEGORY CN
LINE 16229 "DELCERRO" 138.0 16221 "WESTINA " 138.0 1
LINE 16999 "NL. EXP " 138.0 16210 "RILLITO " 138.0 1
RUN 273
CATEGORY CN
LINE 16229 "DELCERRO" 138.0 16221 "WESTINA " 138.0 1
LINE 16218 "TUCSON " 138.0 16229 "DELCERRO" 138.0 1
RUN 274
CATEGORY CN
LINE 16200 "DMP " 138.0 16253 "ANKLAM " 138.0 1
LINE 16214 "SN.CRUZ " 138.0 16253 "ANKLAM " 138.0 1
RUN 275
CATEGORY CN
LINE 16200 "DMP " 138.0 16253 "ANKLAM " 138.0 1
LINE 16218 "TUCSON " 138.0 16229 "DELCERRO" 138.0 1
RUN 276
CATEGORY CN
LINE 16200 "DMP " 138.0 16207 "N. LOOP " 138.0 1
LINE 16200 "DMP " 138.0 16218 "TUCSON " 138.0 1
RUN 277
CATEGORY CN
LINE 16200 "DMP " 138.0 16207 "N. LOOP " 138.0 1
LINE 16999 "NL. EXP " 138.0 16210 "RILLITO " 138.0 1
RUN 278
CATEGORY CN
LINE 16200 "DMP " 138.0 16207 "N. LOOP " 138.0 1
LINE 16999 "NL. EXP " 138.0 16221 "WESTINA " 138.0 1
RUN 279
CATEGORY CN
LINE 16200 "DMP " 138.0 16207 "N. LOOP " 138.0 1
LINE 16217 "TORTOLIT" 138.0 16999 "NL. EXP " 138.0 2
RUN 280
CATEGORY CN
LINE 16200 "DMP " 138.0 16214 "SN.CRUZ " 138.0 1
LINE 16204 "IRVNGTN " 138.0 16218 "TUCSON " 138.0 1
RUN 281
CATEGORY CN
LINE 16200 "DMP " 138.0 16214 "SN.CRUZ " 138.0 1
LINE 16218 "TUCSON " 138.0 16229 "DELCERRO" 138.0 1
RUN 282
CATEGORY CN
LINE 16200 "DMP " 138.0 16218 "TUCSON " 138.0 1
LINE 16218 "TUCSON " 138.0 16229 "DELCERRO" 138.0 1
RUN 283
CATEGORY CN
LINE 16201 "DREXEL " 138.0 16204 "IRVNGTN " 138.0 1
LINE 16204 "IRVNGTN " 138.0 16218 "TUCSON " 138.0 1
RUN 284

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CATEGORY CN
LINE 16201 "DREXEL  " 138.0 16204 "IRVNGTN " 138.0 1
LINE 16214 "SN.CRUZ " 138.0 16204 "IRVNGTN " 138.0 1
RUN 285
CATEGORY CN
LINE 16201 "DREXEL  " 138.0 16206 "MIDVALE " 138.0 1
LINE 16204 "IRVNGTN " 138.0 16218 "TUCSON  " 138.0 1
RUN 286
CATEGORY CN
LINE 16201 "DREXEL  " 138.0 16206 "MIDVALE " 138.0 1
LINE 16214 "SN.CRUZ " 138.0 16204 "IRVNGTN " 138.0 1
RUN 287
CATEGORY CN
LINE 16201 "DREXEL  " 138.0 16206 "MIDVALE " 138.0 1
LINE 16216 "SOUTH   " 138.0 16255 "MEDINA  " 138.0 1
RUN 288
CATEGORY CN
LINE 16201 "DREXEL  " 138.0 16206 "MIDVALE " 138.0 1
LINE 16216 "SOUTH   " 138.0 16235 "SPNCER  " 138.0 1
RUN 289
CATEGORY CN
LINE 16201 "DREXEL  " 138.0 16206 "MIDVALE " 138.0 1
LINE 16235 "SPNCER  " 138.0 16255 "MEDINA  " 138.0 1
RUN 290
CATEGORY CN
LINE 16202 "E. LOOP " 138.0 16247 "HARRISON" 138.0 1
LINE 16202 "E. LOOP " 138.0 16224 "PANTANO " 138.0 1
RUN 291
CATEGORY CN
LINE 16202 "E. LOOP " 138.0 16247 "HARRISON" 138.0 1
LINE 16211 "ROBERTS " 138.0 16247 "HARRISON" 138.0 1
RUN 292
CATEGORY CN
LINE 16202 "E. LOOP " 138.0 16247 "HARRISON" 138.0 1
LINE 16215 "SNYDER  " 138.0 16202 "E. LOOP " 138.0 1
RUN 293
CATEGORY CN
LINE 16202 "E. LOOP " 138.0 16208 "NE.LOOP " 138.0 1
LINE 16215 "SNYDER  " 138.0 16202 "E. LOOP " 138.0 1
RUN 294
CATEGORY CN
LINE 16202 "E. LOOP " 138.0 16208 "NE.LOOP " 138.0 1
LINE 16215 "SNYDER  " 138.0 16208 "NE.LOOP " 138.0 1
RUN 295
CATEGORY CN
LINE 16202 "E. LOOP " 138.0 16224 "PANTANO " 138.0 1
LINE 16202 "E. LOOP " 138.0 16211 "ROBERTS " 138.0 1
RUN 296
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CATEGORY CN
LINE 16202 "E. LOOP " 138.0 16224 "PANTANO " 138.0 1
LINE 16224 "PANTANO " 138.0 16223 "LOSREALS" 138.0 1
RUN 297
CATEGORY CN
LINE 16202 "E. LOOP " 138.0 16224 "PANTANO " 138.0 1
LINE 16213 "S.TRAIL " 138.0 16211 "ROBERTS " 138.0 1
RUN 298
CATEGORY CN
LINE 16202 "E. LOOP " 138.0 16224 "PANTANO " 138.0 1
LINE 16215 "SNYDER " 138.0 16202 "E. LOOP " 138.0 1
RUN 299
CATEGORY CN
LINE 16232 "GREENVLY" 138.0 16227 "CANOARCH" 138.0 1
LINE 16242 "HARTT " 138.0 16232 "GREENVLY" 138.0 1
RUN 300
CATEGORY CN
LINE 16232 "GREENVLY" 138.0 16227 "CANOARCH" 138.0 1
LINE 16216 "SOUTH " 138.0 16232 "GREENVLY" 138.0 1
RUN 301
CATEGORY CN
LINE 16232 "GREENVLY" 138.0 16227 "CANOARCH" 138.0 1
LINE 16227 "CANOARCH" 138.0 16260 "CLEAR " 138.0 1
RUN 302
CATEGORY CN
LINE 16242 "HARTT " 138.0 16232 "GREENVLY" 138.0 1
LINE 16258 "SANRIT_S" 138.0 16242 "HARTT " 138.0 1
RUN 303
CATEGORY CN
LINE 16261 "IRV_RING" 138.0 16216 "SOUTH " 138.0 1
LINE 16204 "IRVNGTN " 138.0 16233 "TECHPARK" 138.0 1
RUN 304
CATEGORY CN
LINE 16261 "IRV_RING" 138.0 16216 "SOUTH " 138.0 1
LINE 16204 "IRVNGTN " 138.0 16220 "VAIL   " 138.0 2
RUN 305
CATEGORY CN
LINE 16261 "IRV_RING" 138.0 16216 "SOUTH " 138.0 1
LINE 16222 "RBWILMOT" 138.0 16220 "VAIL   " 138.0 1
RUN 306
CATEGORY CN
LINE 16204 "IRVNGTN " 138.0 16233 "TECHPARK" 138.0 1
LINE 16222 "RBWILMOT" 138.0 16204 "IRVNGTN " 138.0 1
RUN 307
CATEGORY CN
LINE 16204 "IRVNGTN " 138.0 16233 "TECHPARK" 138.0 1
LINE 16222 "RBWILMOT" 138.0 16220 "VAIL   " 138.0 1
RUN 308

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CATEGORY CN
LINE 16204 "IRVNGTN " 138.0 16218 "TUCSON  " 138.0 1
LINE 16214 "SN.CRUZ " 138.0 16253 "ANKLAM  " 138.0 1
RUN 309
CATEGORY CN
LINE 16204 "IRVNGTN " 138.0 16218 "TUCSON  " 138.0 1
LINE 16214 "SN.CRUZ " 138.0 16204 "IRVNGTN " 138.0 1
RUN 310
CATEGORY CN
LINE 16204 "IRVNGTN " 138.0 16218 "TUCSON  " 138.0 1
LINE 16218 "TUCSON  " 138.0 16246 "KINO    " 138.0 1
RUN 311
CATEGORY CN
LINE 16204 "IRVNGTN " 138.0 16218 "TUCSON  " 138.0 1
LINE 16256 "UA MED  " 138.0 16218 "TUCSON  " 138.0 1
RUN 312
CATEGORY CN
LINE 16204 "IRVNGTN " 138.0 16220 "VAIL    " 138.0 2
LINE 16222 "RBWILMOT" 138.0 16204 "IRVNGTN " 138.0 1
RUN 313
CATEGORY CN
LINE 16204 "IRVNGTN " 138.0 16220 "VAIL    " 138.0 2
LINE 16222 "RBWILMOT" 138.0 16220 "VAIL    " 138.0 1
RUN 314
CATEGORY CN
LINE 16223 "LOSREALS" 138.0 16220 "VAIL    " 138.0 1
LINE 16224 "PANTANO " 138.0 16223 "LOSREALS" 138.0 1
RUN 315
CATEGORY CN
LINE 16223 "LOSREALS" 138.0 16220 "VAIL    " 138.0 1
LINE 16220 "VAIL    " 138.0 16243 "CIENEGA " 138.0 1
RUN 316
CATEGORY CN
LINE 16223 "LOSREALS" 138.0 16220 "VAIL    " 138.0 1
LINE 16220 "VAIL    " 138.0 16230 "FT.HUACH" 138.0 1
RUN 317
CATEGORY CN
LINE 16206 "MIDVALE " 138.0 16235 "SPNCER  " 138.0 1
LINE 16216 "SOUTH   " 138.0 16235 "SPNCER  " 138.0 1
RUN 318
CATEGORY CN
LINE 16206 "MIDVALE " 138.0 16235 "SPNCER  " 138.0 1
LINE 16235 "SPNCER  " 138.0 16255 "MEDINA  " 138.0 1
RUN 319
CATEGORY CN
LINE 16999 "NL. EXP " 138.0 16244 "MARANA  " 138.0 1
LINE 16217 "TORTOLIT" 138.0 16244 "MARANA  " 138.0 1
RUN 320
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CATEGORY CN
LINE 16999 "NL. EXP " 138.0 16244 "MARANA " 138.0 1
LINE 16217 "TORTOLIT" 138.0 16999 "NL. EXP " 138.0 4
RUN 321
CATEGORY CN
LINE 16999 "NL. EXP " 138.0 16244 "MARANA " 138.0 1
LINE 16217 "TORTOLIT" 138.0 16999 "NL. EXP " 138.0 3
RUN 322
CATEGORY CN
LINE 16999 "NL. EXP " 138.0 16244 "MARANA " 138.0 1
LINE 16217 "TORTOLIT" 138.0 16999 "NL. EXP " 138.0 2
RUN 323
CATEGORY CN
LINE 16999 "NL. EXP " 138.0 16244 "MARANA " 138.0 1
LINE 16217 "TORTOLIT" 138.0 16999 "NL. EXP " 138.0 1
RUN 324
CATEGORY CN
LINE 16999 "NL. EXP " 138.0 16244 "MARANA " 138.0 1
LINE 16217 "TORTOLIT" 138.0 16207 "N. LOOP " 138.0 3
RUN 325
CATEGORY CN
LINE 16999 "NL. EXP " 138.0 16244 "MARANA " 138.0 1
LINE 16217 "TORTOLIT" 138.0 16209 "RANVISTO" 138.0 1
RUN 326
CATEGORY CN
LINE 16999 "NL. EXP " 138.0 16244 "MARANA " 138.0 1
LINE 16217 "TORTOLIT" 138.0 16245 "NARANJA " 138.0 1
RUN 327
CATEGORY CN
LINE 16999 "NL. EXP " 138.0 16210 "RILLITO " 138.0 1
LINE 16999 "NL. EXP " 138.0 16221 "WESTINA " 138.0 1
RUN 328
CATEGORY CN
LINE 16999 "NL. EXP " 138.0 16221 "WESTINA " 138.0 1
LINE 16217 "TORTOLIT" 138.0 16999 "NL. EXP " 138.0 1
RUN 329
CATEGORY CN
LINE 16208 "NE.LOOP " 138.0 16210 "RILLITO " 138.0 1
LINE 16210 "RILLITO " 138.0 16205 "LACANADA" 138.0 1
RUN 330
CATEGORY CN
LINE 16251 "ORNGROVE" 138.0 16254 "EASTINA " 138.0 1
LINE 16251 "ORNGROVE" 138.0 16205 "LACANADA" 138.0 1
RUN 331
CATEGORY CN
LINE 16251 "ORNGROVE" 138.0 16254 "EASTINA " 138.0 1
LINE 16251 "ORNGROVE" 138.0 16210 "RILLITO " 138.0 1
RUN 332

CATEGORY CN
LINE 16251 "ORNGROVE" 138.0 16205 "LACANADA" 138.0 1
LINE 16251 "ORNGROVE" 138.0 16210 "RILLITO " 138.0 1
RUN 333
CATEGORY CN
LINE 16209 "RANVISTO" 138.0 16245 "NARANJA " 138.0 1
LINE 16217 "TORTOLIT" 138.0 16245 "NARANJA " 138.0 1
RUN 334
CATEGORY CN
LINE 16257 "RAYTHEON" 138.0 16255 "MEDINA " 138.0 1
LINE 16216 "SOUTH " 138.0 16257 "RAYTHEON" 138.0 1
RUN 335
CATEGORY CN
LINE 16257 "RAYTHEON" 138.0 16255 "MEDINA " 138.0 1
LINE 16235 "SPNCER " 138.0 16255 "MEDINA " 138.0 1
RUN 336
CATEGORY CN
LINE 16222 "RBWILMOT" 138.0 16204 "IRVNGTN " 138.0 1
LINE 16222 "RBWILMOT" 138.0 16220 "VAIL " 138.0 1
RUN 337
CATEGORY CN
LINE 16222 "RBWILMOT" 138.0 16220 "VAIL " 138.0 1
LINE 16233 "TECHPARK" 138.0 16220 "VAIL " 138.0 1
RUN 338
CATEGORY CN
LINE 16211 "ROBERTS " 138.0 16247 "HARRISON" 138.0 1
LINE 16213 "S.TRAIL " 138.0 16211 "ROBERTS " 138.0 1
RUN 339
CATEGORY CN
LINE 16214 "SN.CRUZ " 138.0 16253 "ANKLAM " 138.0 1
LINE 16218 "TUCSON " 138.0 16229 "DELCERRO" 138.0 1
RUN 340
CATEGORY CN
LINE 16216 "SOUTH " 138.0 16255 "MEDINA " 138.0 1
LINE 16235 "SPNCER " 138.0 16255 "MEDINA " 138.0 1
RUN 341
CATEGORY CN
LINE 16217 "TORTOLIT" 138.0 16244 "MARANA " 138.0 1
LINE 16217 "TORTOLIT" 138.0 16207 "N. LOOP " 138.0 4
RUN 342
CATEGORY CN
LINE 16217 "TORTOLIT" 138.0 16244 "MARANA " 138.0 1
LINE 16217 "TORTOLIT" 138.0 16999 "NL. EXP " 138.0 4
RUN 343
CATEGORY CN
LINE 16217 "TORTOLIT" 138.0 16244 "MARANA " 138.0 1
LINE 16217 "TORTOLIT" 138.0 16999 "NL. EXP " 138.0 3
RUN 344

CATEGORY CN
LINE 16217 "TORTOLIT" 138.0 16244 "MARANA " 138.0 1
LINE 16217 "TORTOLIT" 138.0 16999 "NL. EXP " 138.0 2
RUN 345
CATEGORY CN
LINE 16217 "TORTOLIT" 138.0 16244 "MARANA " 138.0 1
LINE 16217 "TORTOLIT" 138.0 16999 "NL. EXP " 138.0 1
RUN 346
CATEGORY CN
LINE 16217 "TORTOLIT" 138.0 16244 "MARANA " 138.0 1
LINE 16217 "TORTOLIT" 138.0 16207 "N. LOOP " 138.0 3
RUN 347
CATEGORY CN
LINE 16217 "TORTOLIT" 138.0 16244 "MARANA " 138.0 1
LINE 16217 "TORTOLIT" 138.0 16209 "RANVISTO" 138.0 1
RUN 348
CATEGORY CN
LINE 16217 "TORTOLIT" 138.0 16244 "MARANA " 138.0 1
LINE 16217 "TORTOLIT" 138.0 16245 "NARANJA " 138.0 1
RUN 349
CATEGORY CN
LINE 16217 "TORTOLIT" 138.0 16207 "N. LOOP " 138.0 4
XFMR 16217 "TORTOLIT" 138.0 16001 "TORTLIT2" 500.0 1
RUN 350
CATEGORY CN
LINE 16217 "TORTOLIT" 138.0 16207 "N. LOOP " 138.0 4
XFMR 16217 "TORTOLIT" 138.0 16000 "TORTOLIT" 500.0 1
RUN 351
CATEGORY CN
LINE 16217 "TORTOLIT" 138.0 16207 "N. LOOP " 138.0 4
XFMR 16217 "TORTOLIT" 138.0 16000 "TORTOLIT" 500.0 2
RUN 352
CATEGORY CN
LINE 16217 "TORTOLIT" 138.0 16207 "N. LOOP " 138.0 4
XFMR 16217 "TORTOLIT" 138.0 16000 "TORTOLIT" 500.0 3
RUN 353
CATEGORY CN
LINE 16217 "TORTOLIT" 138.0 16207 "N. LOOP " 138.0 4
XFMR 16217 "TORTOLIT" 138.0 16000 "TORTOLIT" 500.0 4
RUN 354
CATEGORY CN
LINE 16217 "TORTOLIT" 138.0 16999 "NL. EXP " 138.0 4
LINE 16217 "TORTOLIT" 138.0 16999 "NL. EXP " 138.0 3
RUN 355
CATEGORY CN
LINE 16217 "TORTOLIT" 138.0 16999 "NL. EXP " 138.0 4
LINE 16217 "TORTOLIT" 138.0 16999 "NL. EXP " 138.0 2
RUN 356

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CATEGORY CN
LINE 16217 "TORTOLIT" 138.0 16999 "NL. EXP " 138.0 4
LINE 16217 "TORTOLIT" 138.0 16999 "NL. EXP " 138.0 1
RUN 357
CATEGORY CN
LINE 16217 "TORTOLIT" 138.0 16999 "NL. EXP " 138.0 4
LINE 16217 "TORTOLIT" 138.0 16207 "N. LOOP " 138.0 3
RUN 358
CATEGORY CN
LINE 16217 "TORTOLIT" 138.0 16999 "NL. EXP " 138.0 4
LINE 16217 "TORTOLIT" 138.0 16209 "RANVISTO" 138.0 1
RUN 359
CATEGORY CN
LINE 16217 "TORTOLIT" 138.0 16999 "NL. EXP " 138.0 2
LINE 16217 "TORTOLIT" 138.0 16245 "NARANJA " 138.0 1
RUN 360
CATEGORY CN
LINE 16219 "TWNTYSEC" 138.0 16202 "E. LOOP " 138.0 1
LINE 16219 "TWNTYSEC" 138.0 16204 "IRVNGTN " 138.0 1
RUN 361
CATEGORY CN
LINE 16220 "VAIL    " 138.0 16243 "CIENEGA " 138.0 1
LINE 16220 "VAIL    " 138.0 16230 "FT.HUACH" 138.0 1
RUN 362
CATEGORY CN
LINE 16258 "SANRIT_S" 138.0 16232 "GREENVLY" 138.0 1
LINE 16216 "SOUTH   " 138.0 16258 "SANRIT_S" 138.0 1
RUN 363
CATEGORY CN
LINE 16258 "SANRIT_S" 138.0 16242 "HARTT   " 138.0 1
LINE 16216 "SOUTH   " 138.0 16258 "SANRIT_S" 138.0 1
RUN 364
CATEGORY CT
COMM * "IRV BUS DIF"
BUS 16204 "IRVNGTN " 138.0
RUN 365
CATEGORY CN
COMM * "TU-DC/TU CAPS"
LINE 16218 "TUCSON  " 138.0 16229 "DELCERRO" 138.0 1
SHNT 16218 "TUCSON  " 138.0 0    "      "  0.0 b1
SHNT 16218 "TUCSON  " 138.0 0    "      "  0.0 b2
RUN 366
CATEGORY CN
COMM * "IR-TU/TU CAPS"
LINE 16204 "IRVNGTN " 138.0 16218 "TUCSON  " 138.0 1
SHNT 16218 "TUCSON  " 138.0 0    "      "  0.0 b1
SHNT 16218 "TUCSON  " 138.0 0    "      "  0.0 b2
RUN 367
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CATEGORY CN
COMM * " NL EXP-RI/RI CAPS"
LINE 16299 "NL. EXP " 138.0 16210 "RILLITO " 138.0 1
SHNT 16210 "RILLITO " 138.0 0    "      "  0.0 b1
SHNT 16210 "RILLITO " 138.0 0    "      "  0.0 b2
XFMR 16616 "RILLITO1"  13.8 16210 "RILLITO " 138.0 1
RUN 368
CATEGORY CN
COMM * " NE-RI/RI CAPS/DIST T1"
LINE 16208 "NE.LOOP " 138.0 16210 "RILLITO " 138.0 1
SHNT 16210 "RILLITO " 138.0 0    "      "  0.0 b1
SHNT 16210 "RILLITO " 138.0 0    "      "  0.0 b2
XFMR 16616 "RILLITO1"  13.8 16210 "RILLITO " 138.0 1
RUN 369
CATEGORY CN
LINE 16217 "TORTOLIT" 138.0 16207 "N. LOOP " 138.0 4
XFMR 16207 "N. LOOP " 138.8 16405 "N. LOOP "  47.2 1
RUN 370
CATEGORY CN
COMM * "NL EXP-WI/WIT1/WICAPS/DIST T1"
LINE 16299 "NL. EXP " 138.0 16221 "WESTINA " 138.0 1
XFMR 16632 "WESTINA1"  13.8 16221 "WESTINA " 138.0 1
SHNT 16221 "WESTINA " 138.0    0 "      "  0.0 b1
SHNT 16221 "WESTINA " 138.0    0 "      "  0.0 b2
XFMR 16632 "WESTINA1"  13.8 16221 "WESTINA " 138.0 1
RUN 371
CATEGORY CN
COMM * "DCWI/WIT1/WICAPS/DIST T1"
LINE 16229 "DELCERRO" 138.0 16221 "WESTINA " 138.0 1
XFMR 16632 "WESTINA1"  13.8 16221 "WESTINA " 138.0 1
SHNT 16221 "WESTINA " 138.0    0 "      "  0.0 b1
SHNT 16221 "WESTINA " 138.0    0 "      "  0.0 b2
XFMR 16644 "DELCERRO"  13.8 16229 "DELCERRO" 138.0 1
RUN 372
CATEGORY CN
LINE 16200 "DMP    " 138.0 16214 "SN.CRUZ " 138.0 1
XFMR 16514 "DMPCCT#1"  13.8 16200 "DMP    " 138.0 1
RUN 373
CATEGORY CN
COMM * "IR-SO/IR CAPS"
LINE 16204 "IRVNGTN " 138.0 16216 "SOUTH   " 138.0 1
SHNT 16204 "IRVNGTN " 138.0    0 "      "  0.0 b1
SHNT 16204 "IRVNGTN " 138.0    0 "      "  0.0 b2
RUN 374
CATEGORY CT
COMM * "VLT2/VL-CAPS"
XFMR 16106 "VAIL2   " 345.0 16220 "VAIL    " 138.0 1
SHNT 16220 "VAIL    " 138.0    0 "      "  0.0 b1
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SHNT 16220 "VAIL   " 138.0    0 "       "  0.0 b2
SHNT 16220 "VAIL   " 138.0    0 "       "  0.0 b3
SHNT 16220 "VAIL   " 138.0    0 "       "  0.0 b4
SHNT 16220 "VAIL   " 138.0    0 "       "  0.0 b5
RUN 375
CATEGORY CT
COMM * "NL LONG 2011"
LINE 16200 "DMP    " 138.0 16207 "N. LOOP " 138.0 1
LINE 16207 "N. LOOP " 138.0 16210 "RILLITO " 138.0 1
LINE 16217 "TORTOLIT" 138.0 16207 "N. LOOP " 138.0 2A
XFMR 16207 "N. LOOP " 138.8 16405 "N. LOOP "  47.2 1
RUN 376
CATEGORY CN
COMM * "NL SHORT 11-12"
LINE 16217 "TORTOLIT" 138.0 16207 "N. LOOP " 138.0 4
XFMR 16207 "N. LOOP " 138.8 16410 "N. LOOP2"  47.2 1
SHNT 16207 "N. LOOP " 138.0    0 "       "  0.0 b1
SHNT 16207 "N. LOOP " 138.0    0 "       "  0.0 b2
RUN 377
CATEGORY CN
COMM * "EL South"
LINE 16219 "TWNTYSEC" 138.0 16202 "E. LOOP " 138.0 1
LINE 16202 "E. LOOP " 138.0 16224 "PANTANO " 138.0 1
XFMR 16202 "E. LOOP " 138.0 16401 "E. LOOP "  47.2 1
XFMR 16607 "E.LPLD3 "  13.8 16202 "E. LOOP " 138.0 1
RUN 378
CATEGORY CN
COMM * "EL North- PRE HARRISON"
LINE 16202 "E. LOOP " 138.0 16211 "ROBERTS " 138.0 1
LINE 16215 "SNYDER  " 138.0 16202 "E. LOOP " 138.0 1
LINE 16202 "E. LOOP " 138.0 16208 "NE.LOOP " 138.0 1
XFMR 16606 "E.LPLD2 "  13.8 16202 "E. LOOP " 138.0 1
XFMR 16608 "E.LPLD4 "  13.8 16202 "E. LOOP " 138.0 1
SHNT 16202 "E. LOOP " 138.0    0 "       "  0.0 b1
SHNT 16202 "E. LOOP " 138.0    0 "       "  0.0 b2
SHNT 16202 "E. LOOP " 138.0    0 "       "  0.0 b3
RUN 379
CATEGORY CN
COMM * "EL North - POST HARRISON"
LINE 16202 "E. LOOP " 138.0 16247 "HARRISON" 138.0 1
LINE 16215 "SNYDER  " 138.0 16202 "E. LOOP " 138.0 1
LINE 16202 "E. LOOP " 138.0 16208 "NE.LOOP " 138.0 1
XFMR 16606 "E.LPLD2 "  13.8 16202 "E. LOOP " 138.0 1
XFMR 16608 "E.LPLD4 "  13.8 16202 "E. LOOP " 138.0 1
SHNT 16202 "E. LOOP " 138.0    0 "       "  0.0 b1
SHNT 16202 "E. LOOP " 138.0    0 "       "  0.0 b2
SHNT 16202 "E. LOOP " 138.0    0 "       "  0.0 b3
RUN 380
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CATEGORY CN
COMM * "NE East"
LINE 16200 "DMP     " 138.0 16208 "NE.LOOP " 138.0 1
LINE 16202 "E. LOOP " 138.0 16208 "NE.LOOP " 138.0 1
LINE 16208 "NE.LOOP " 138.0 16298 "NELP_SVC" 138.0 1
XFMR 16208 "NE.LOOP " 138.0 16406 "NE.LOOP1"  47.2 1
SHNT 16208 "NE.LOOP " 138.0    0 "       "  0.0 b1
SHNT 16208 "NE.LOOP " 138.0    0 "       "  0.0 b2
SHNT 16208 "NE.LOOP " 138.0    0 "       "  0.0 b3
SHNT 16208 "NE.LOOP " 138.0    0 "       "  0.0 b4
RUN 381
CATEGORY CN
COMM * "NE West 12-"
LINE 16215 "SNYDER  " 138.0 16208 "NE.LOOP " 138.0 1
LINE 16208 "NE.LOOP " 138.0 16210 "RILLITO " 138.0 1
XFMR 16208 "NE.LOOP " 138.0 16407 "NE.LOOP2"  47.2 1
RUN 382
CATEGORY CN
COMM * "NE West 13+"
LINE 16239 "CRYCROFT" 138.0 16208 "NE.LOOP " 138.0 1
LINE 16208 "NE.LOOP " 138.0 16210 "RILLITO " 138.0 1
XFMR 16208 "NE.LOOP " 138.0 16407 "NE.LOOP2"  47.2 1
RUN 383
CATEGORY CN
COMM * "NL-DMP DMP 138/46"
LINE 16200 "DMP     " 138.0 16207 "N. LOOP " 138.0 1
XFMR 16200 "DMP     " 138.0 16400 "DMP     "  47.2 1
RUN 384
CATEGORY CN
COMM * "DMP CT - DMP 138/46"
XFMR 16514 "DMPCCT#1"  13.8 16200 "DMP     " 138.0 1
XFMR 16200 "DMP     " 138.0 16400 "DMP     "  47.2 1
RUN 385
CATEGORY CN
LINE 16200 "DMP     " 138.0 16999 "NL. EXP " 138.0 1
LINE 16218 "TUCSON  " 138.0 16229 "DELCERRO" 138.0 1
RUN 386
CATEGORY CN
LINE 16200 "DMP     " 138.0 16207 "N. LOOP " 138.0 1
LINE 16218 "TUCSON  " 138.0 16229 "DELCERRO" 138.0 1
RUN 387
CATEGORY CN
LINE 16201 "DREXEL  " 138.0 16206 "MIDVALE " 138.0 1
LINE 16206 "MIDVALE " 138.0 16235 "SPNCER  " 138.0 1
RUN 388
CATEGORY CN
LINE 16201 "DREXEL  " 138.0 16206 "MIDVALE " 138.0 1
LINE 16216 "SOUTH   " 138.0 16206 "MIDVALE " 138.0 1
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RUN 389
CATEGORY CN
LINE 16202 "E. LOOP " 138.0 16211 "ROBERTS " 138.0 1
LINE 16213 "S.TRAIL " 138.0 16211 "ROBERTS " 138.0 1
RUN 390
CATEGORY CN
LINE 16202 "E. LOOP " 138.0 16211 "ROBERTS " 138.0 1
LINE 16215 "SNYDER  " 138.0 16202 "E. LOOP " 138.0 1
RUN 391
CATEGORY CN
LINE 16232 "GREENVLY" 138.0 16227 "CANOARCH" 138.0 1
LINE 16258 "SANRIT_S" 138.0 16232 "GREENVLY" 138.0 1
RUN 392
CATEGORY CN
LINE 16242 "HARTT   " 138.0 16232 "GREENVLY" 138.0 1
LINE 16216 "SOUTH   " 138.0 16242 "HARTT   " 138.0 1
RUN 393
CATEGORY CN
LINE 16261 "IRV_RING" 138.0 16216 "SOUTH   " 138.0 1
LINE 16222 "RBWILMOT" 138.0 16204 "IRVNGTN " 138.0 1
RUN 394
CATEGORY CN
LINE 16204 "IRVNGTN " 138.0 16233 "TECHPARK" 138.0 1
LINE 16233 "TECHPARK" 138.0 16220 "VAIL    " 138.0 1
RUN 395
CATEGORY CN
LINE 16223 "LOSREALS" 138.0 16220 "VAIL    " 138.0 1
LINE 16222 "RBWILMOT" 138.0 16220 "VAIL    " 138.0 1
RUN 396
CATEGORY CN
LINE 16999 "NL. EXP " 138.0 16210 "RILLITO " 138.0 1
LINE 16208 "NE.LOOP " 138.0 16210 "RILLITO " 138.0 1
RUN 397
CATEGORY CN
LINE 16216 "SOUTH   " 138.0 16260 "CLEAR   " 138.0 1
LINE 16227 "CANOARCH" 138.0 16260 "CLEAR   " 138.0 1
RUN 398
CATEGORY CN
LINE 16216 "SOUTH   " 138.0 16260 "CLEAR   " 138.0 1
LINE 16228 "CYPRUS  " 138.0 16260 "CLEAR   " 138.0 1
RUN 399
CATEGORY CN
LINE 16227 "CANOARCH" 138.0 16260 "CLEAR   " 138.0 1
LINE 16228 "CYPRUS  " 138.0 16260 "CLEAR   " 138.0 1
RUN 400
DONE
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