Fifth Biennial Transmission Assessment 2008-2017

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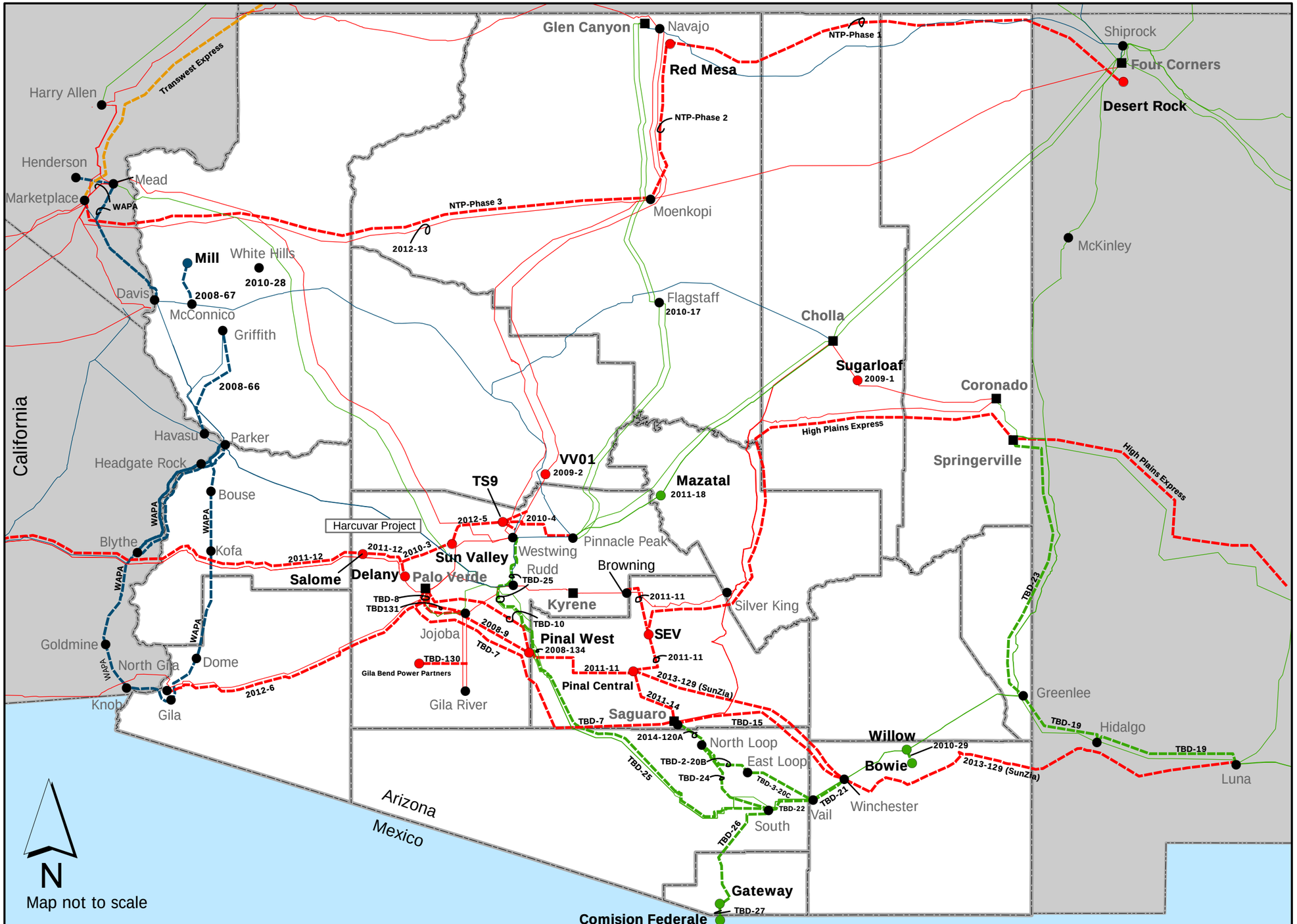
Existing and Planned Arizona EHV Transmission Map

Exhibit 1



Legend

Facilities

- Existing Power Plant
- Existing Substation

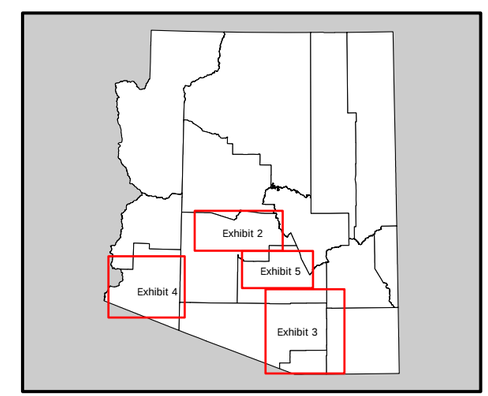
Substations

- 500 kV Planned
- 345 kV Planned
- 230 kV Planned

Transmission

- 500 kV AC Existing
- 345 kV AC Existing
- 230 kV AC Existing
- 500 kV DC Planned
- 500 kV AC Planned
- 345 kV AC Planned
- 230 kV AC Planned

Project Look-up ID Format [IN SERVICE YEAR-ID and PHASE]
Examples -
2008-12 = In-Service in 2008, Look-up Table Id 12
TBD-13C = In-Serivce "To-Be-Determined", Look-up Id 13, Phase C



Notes

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1. Only pertinent transmission voltage levels shown
2. Project identification refers to details on Project Lookup table
3. Routes locations of transmission lines are concetpual only

ACC Docket #E-00000D-07-0376
5th Bienniel Transmission Assessment

DISCLAIMER:
K.R. Saline & Associates P.L.C.
Does not warrant the accuracy or location of the facilities shown

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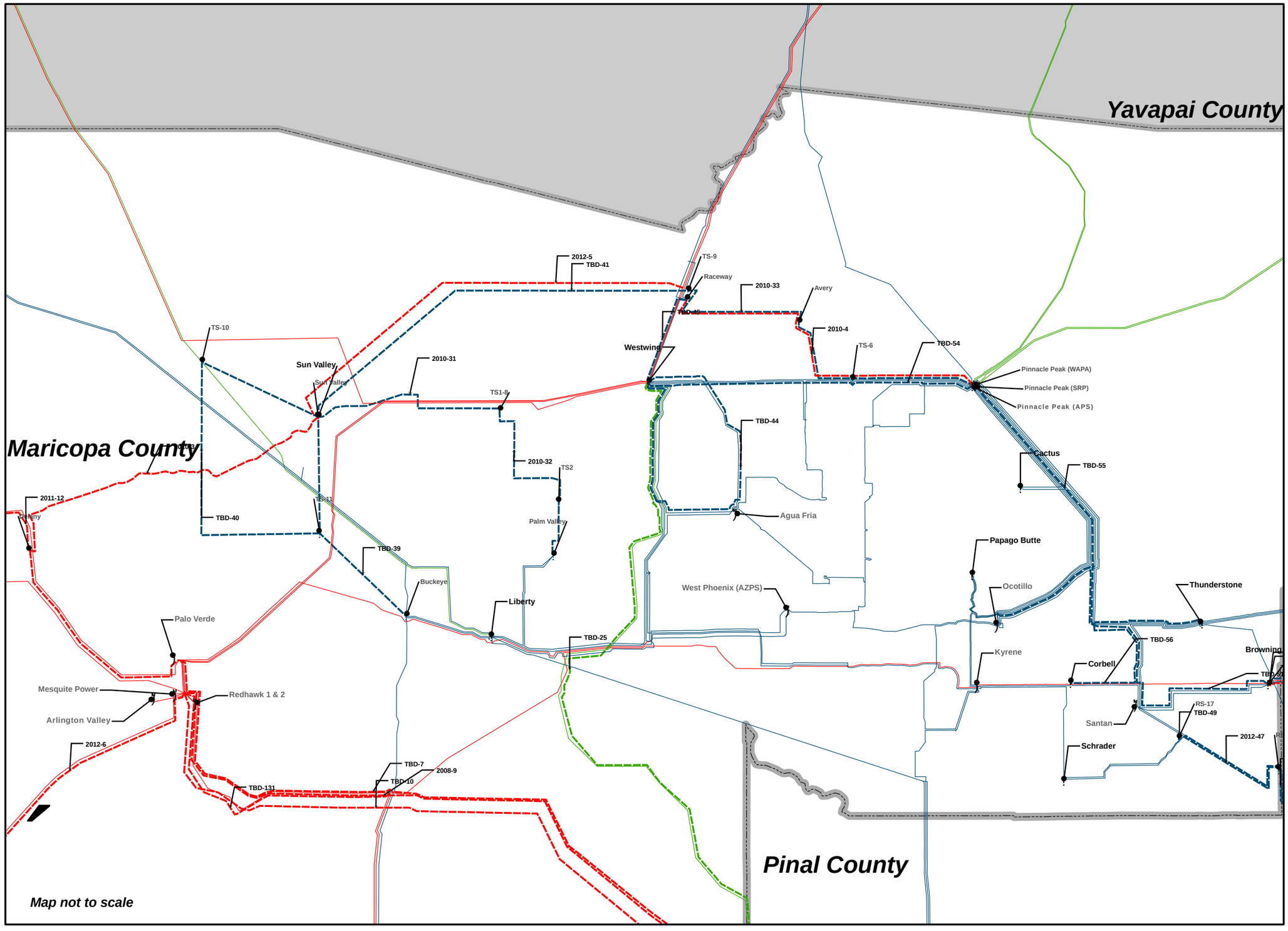
Metro Phoenix Planned and ExistingTransmission above 230kV

Exhibit 2



Legend

Facilities

- Existing Substation
- Existing Power Plant

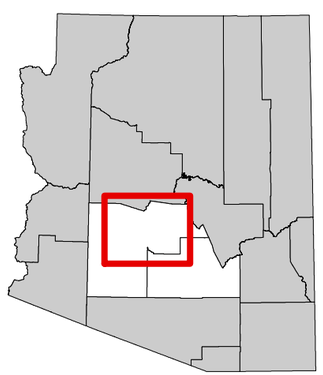
Substations

- 500kV Planned
- 230kV Planned

Transmission

- 500kV Existing
- 345kV Existing
- 230kV Existing
- 500kV Planned
- 345kV Planned
- 230kV Planned

Project Look-up ID Format [IN SERVICE YEAR-ID and PHASE]
Examples -
2008-12 = In-Service in 2008, Look-up Table Id 12
TBD-13C = In-Serivce "To-Be-Determined", Look-up Id 13, Phase C



Notes:

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1. Project identification refers to details on Exhibit 2 tables
2. Route locations of transmission lines are conceptual only

ACC Docket #E-00000D-07-0376
5th Biennial Transmission Assessment

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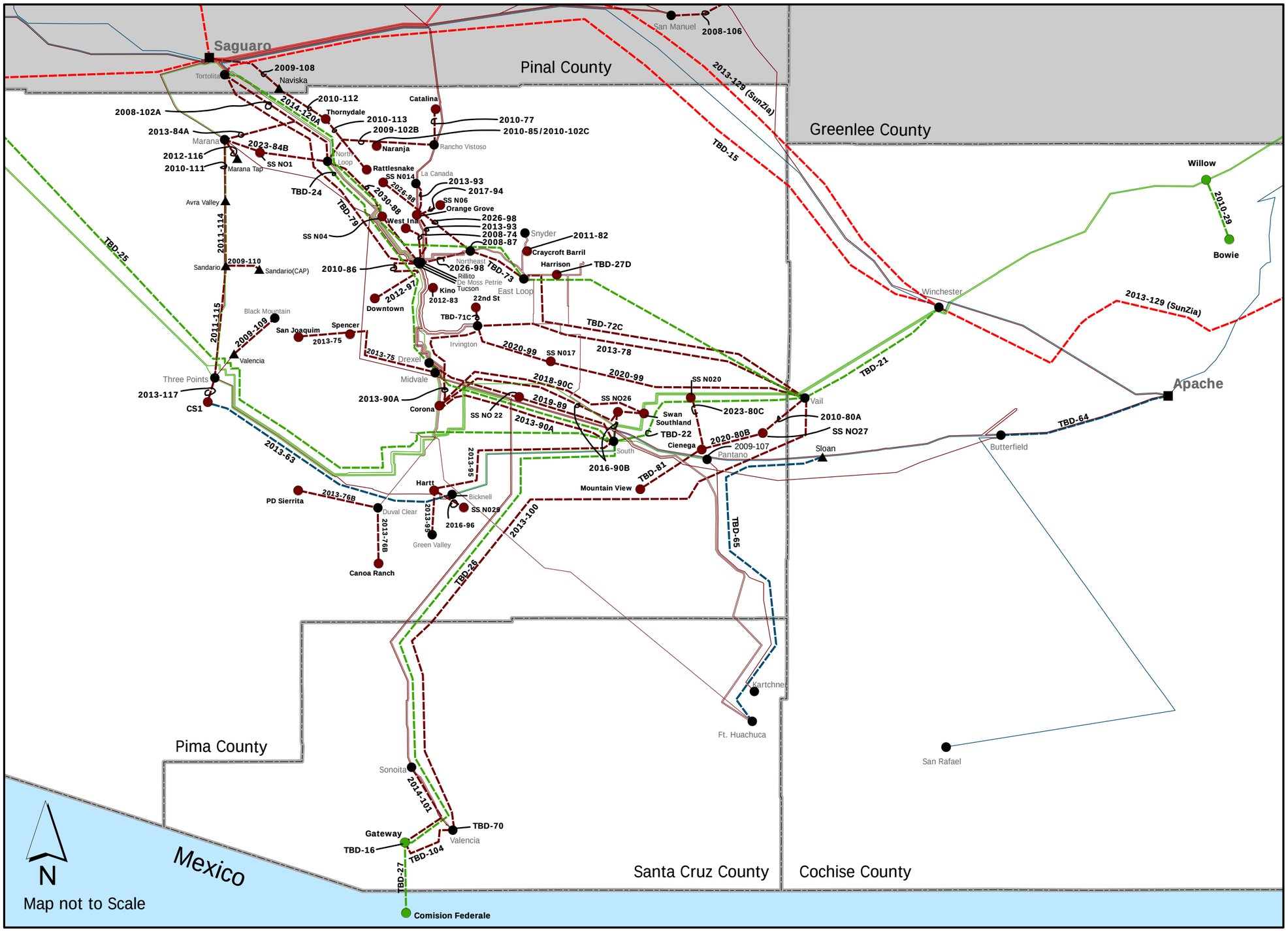
Existing and Planned Southeastern Arizona Transmission System

Exhibit 3



Legend

Facilities

- Existing Power Plant
- Existing Substation

Planned Substation

- 500 kV Planned
- 345 kV Planned
- 230 kV Planned
- 138 kV Planned

Transmission

- 500 kV AC Existing
- 345 kV AC Existing
- 230 kV AC Existing
- 138 kV AC Existing
- 115 kV AC Existing
- 500 kV AC Planned
- 345 kV AC Planned
- 230 kV AC Planned
- 138 kV AC Planned

Project Look-up ID Format [IN SERVICE YEAR-ID and PHASE]
Examples -
2008-12 = In-Service in 2008, Look-up Table Id 12
TBD-13C = In-Serivce "To-Be-Determined", Look-up Id 13, Phase C

Notes

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1. Only pertinent transmission voltage levels shown
2. Project identification refers to details on Project Lookup table
3. Routes locations of transmission lines are concetpual only

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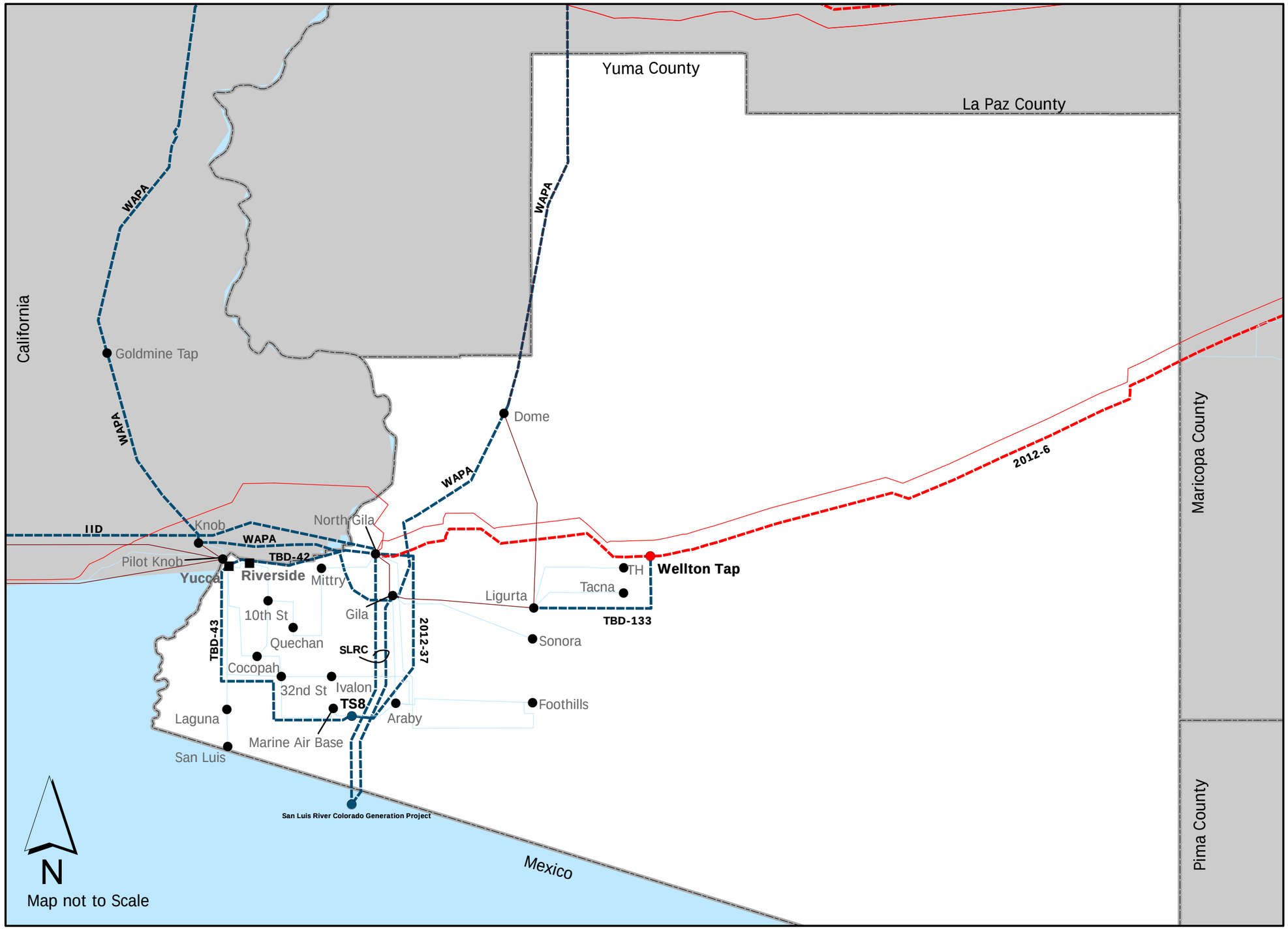
Yuma County Transmission System Above 69 kV

Exhibit 4



Legend

Facilities

- Existing Power Plant
- Existing Substation

Planned Substation

- 500 kV Planned
- 345 kV Planned
- 230 kV Planned
- 138 kV Planned

Transmission

- 500 kV AC Existing
- 161 kV AC Existing
- 69 kV AC Existing
- 500 kV AC Planned
- 230 kV AC Planned

Project Look-up ID Format [IN SERVICE YEAR-ID and PHASE]
Examples -
2008-12 = In-Service in 2008, Look-up Table Id 12
TBD-13C = In-Serivce "To-Be-Determined", Look-up Id 13, Phase C

Notes

---

1. Only pertinent transmission voltage levels shown
2. Project identification refers to details on Project Lookup table
3. Routes locations of transmission lines are concetputal only

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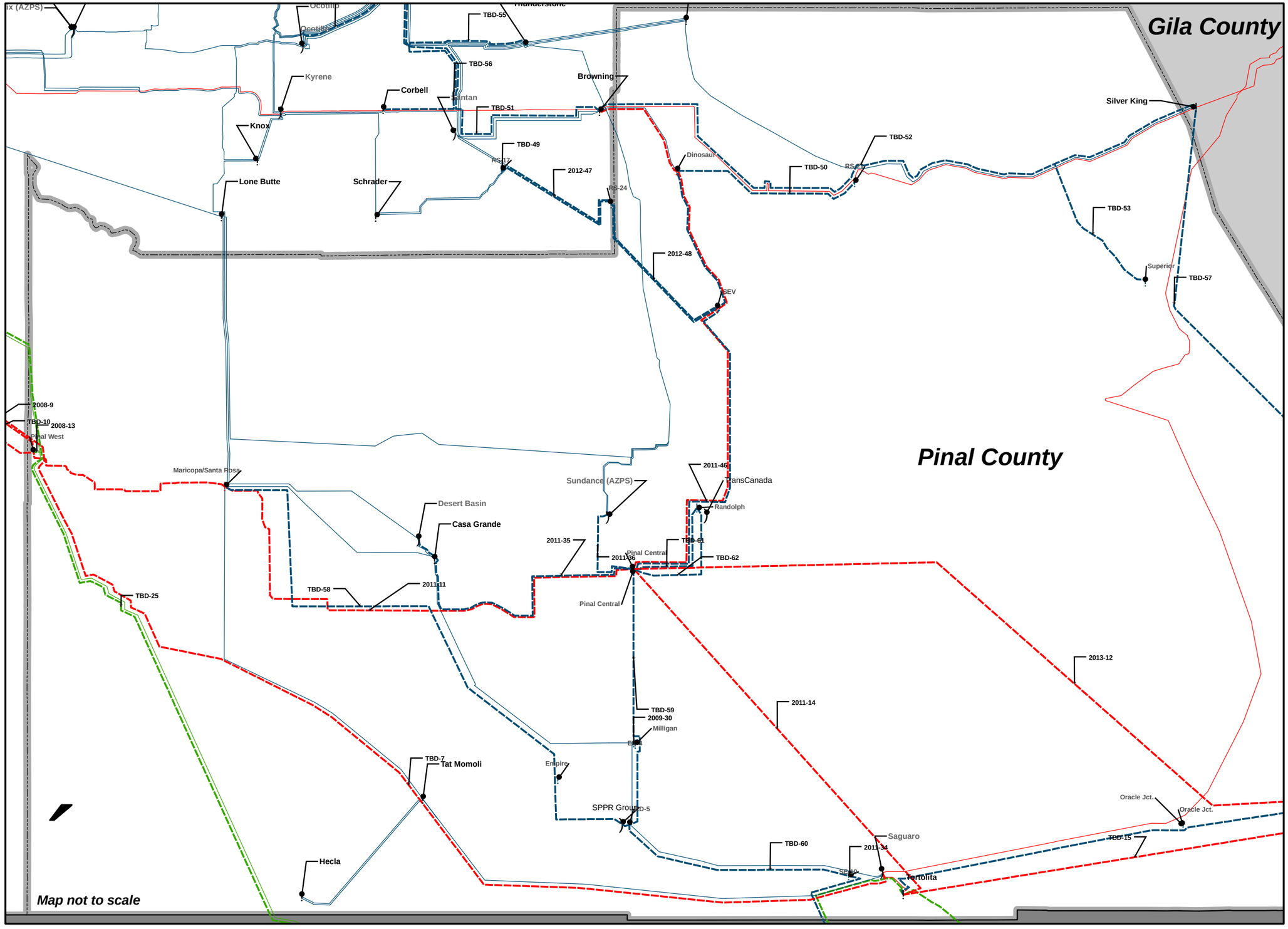
Pinal County Planned and ExistingTransmission above 230kV

Exhibit 5



Legend

Facilities

- Existing Substation
- Existing Power Plant

Substations

- 500kV Planned
- 230kV Planned

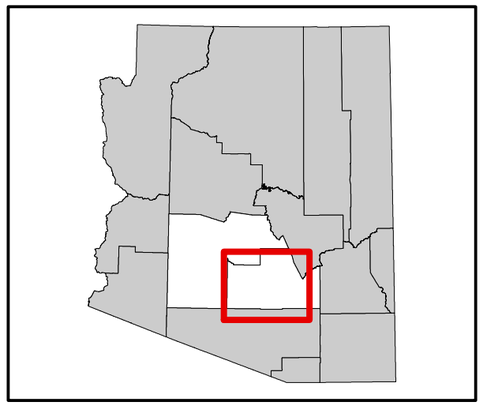
Transmission

- 500kV Existing
- 345kV Existing
- 230kV Existing
- 500kV Planned
- 345kV Planned
- 230kV Planned

Power Plants

- Planned Generation

Project Look-up ID Format [IN SERVICE YEAR-ID and PHASE]
Examples -
2008-12 = In-Service in 2008, Look-up Table Id 12
TBD-13C = In-Serivce "To-Be-Determined", Look-up Id 13, Phase C



Notes:

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1. Project identification refers to details on Project Lookup table
2. Route locations of transmission lines are conceptual only

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Exhibit 6 – Arizona Planned Project Lookup Table

Reference #	Description	Participants	Mileage	Permitting/Siting Status
2008-102A	Tortolita-North Loop-Rancho Vistoso Project - Phase 1 - Tortolita-North Loop	TEP	14.30	CEC Not Yet Filed
2008-106	Apache/Hayden-San Manuel 115 kV line	SWTC	4.50	CEC Not Yet Filed
2008-134	Interconnection of Westwing-South 345kV with future Hassayampa-Pinal West 500 kV	TEP	1.00	CEC Approved - Case #124
2008-66	Griffith-North Havasu 230 kV line	UNISOURCE	40.00	CEC Approved/Extended - Case #88
2008-67	Golden Valley 230 kV Project - McConico-Mercator Mill 230 kV line	UNISOURCE	20.00	CEC Not Yet Filed
2008-74	Loop existing West Ina -Tucson 138 kV line	TEP	0.95	CEC Approved - Case #62
2008-87	Northeast 138 kV Static Var Compensator (SVC)	TEP	0.00	CEC Not Required
2008-9	Hassayampa-Pinal West 500 kV #1 line	SRP, TEP, SWTC,ED2,ED3, ED4	51.00	CEC Approved – Case #124
2009-1	Sugarloaf Loop-in of Coronado-Cholla 500 kV line	APS, SRP	0.95	CEC Not Required
2009-102B	Tortolita-North Loop-Rancho Vistoso Project - Phase 2 - North Loop-Rancho Vistoso	TEP	11.10	CEC Not Yet Filed
2009-107	Western 115 kV line loop-in to Pantano	SWTC	0.20	CEC Not Required
2009-108	Saguaro-Naviska 115 kV line	SWTC	3.20	CEC Not Yet Filed
2009-109	Valencia-CAP Black Mountain 115 kV line	SWTC	2.60	CEC Not Yet Filed
2009-110	CAP 115 kV line loop-in to SWTC Sandario	SWTC	0.60	CEC Not Required
2009-2	VV01 Loop-in of Navajo-Westwing 500 kV line	APS	0.95	CEC Not Required
2009-30	Milligan Loop-in of Saguaro-Casa Grande 230 kV line	APS	0.95	Not Required
2010-102C	Tortolita-North Loop-Rancho Vistoso Project - Phase 3 - Corridor Expansion	TEP	18.00	CEC Not Yet Filed
2010-111	Marana-Avra Valley 115 kV Line Upgrade	SWTC	8.75	CEC Not Yet Filed
2010-112	Naviska-Thornydale 115 kV line	SWTC	7.00	CEC Not Yet Filed
2010-113	Thornydale-Rattlesnake 115 kV line	SWTC	19.00	CEC Not Yet Filed
2010-17	345/69 kV Interconnection at Western's Flagstaff 345 kV bus	APS	0.95	CEC Not Required
2010-28	White Hills substation	UNISOURCE	0.00	CEC Not Required
2010-29	Bowie Power Project	BOWIE	15.00	CEC Approved – Decision #64626
2010-3	Palo Verde Hub-Sun Valley 500 kV line	APS, SRP, CAWCD	45.00	CEC Approved – Decision #68063

2010-31	Sun Valley-TS1 - 230 kV line	APS	15.00	CEC Approved – Decision #67828
2010-32	Palm Valley-TS2-TS1 230 kV line	APS	12.00	CEC Approved - Decisions #66646 and #67828
2010-33	TS9-Raceway-Avery-TS6-Pinnacle Peak 230 kV line	APS	27.00	CEC Approved – Decision #69343
2010-4	TS9-Pinnacle Peak 500 KV line	APS, SRP	26.00	CEC Approved – Decision #69343
2010-77	Rancho Vistoso-(Future) Catalina 138 kV line	TEP	3.50	CEC Not Required
2010-80A	Vail-SS NO27-Cienega-SSNO22-Spanish Trail Project - Phase 1 - Vail-Cienega 138 kV line	TEP	12.20	CEC Not Yet Filed
2010-85	North Loop-Rancho Vistoso 138 kV tap for future Naranja substation	TEP	24.50	CEC Not Yet Filed
2010-86	DeMoss Petrie-Tucson 138 kV line	TEP	4.50	CEC Not Yet Filed
2011-11	Pinal West-Southeast Valley-Browning 500 kV line	SRP, TEP, SWTC,ED2,ED3, ED4	50.00	CEC Approved - Case #126
2011-114	Avra Valley-Sandario Tap 115 kV Line Upgrade	SWTC	2.80	CEC Not Yet Filed
2011-115	Sandario Tap-Three Points 115 kV Line Upgrade	SWTC	13.71	CEC Not Yet Filed
2011-12	Devers - Palo Verde 500 kV #2 line	SCE	230.00	CEC Denied - Case #130
2011-14	Pinal Central-Tortolita 500 kV line	TEP, SWTC	30.00	CEC Not Yet Filed
2011-18	Mazatzal Loop-in of Cholla-Pinnacle Peak 345 kV line	APS	0.95	CEC Not Required
2011-34	SE10 Loop-in of Saguaro-Casa Grande 230 kV line	APS	0.95	Not Required
2011-35	Desert Basin-Pinal South 230 kV	APS, SRP	21.00	CEC Approved – Decisions #68093, #68291, #69183 and #69647
2011-36	Sundance-Pinal South 230 kV line	APS, ED2	6.00	CEC Filed – Case #136
2011-46	Pinal South-Southeast Valley/RS22	SRP	30.00	CEC Approved - Decisions #68093 and #69291
2011-82	Northeast-Snyder 138 kV Tap for Craycroft-Barril substations	TEP	8.00	CEC Not Required
2012-116	Marana Tap-Marana 115 kV Line Upgrade	SWTC	0.20	CEC Not Required
2012-13	Moenkopi-Eldorado 500 kV Series Capacitor Upgrade Project	SCE, APS	0.00	CEC Not Required
2012-37	North Gila-TS8 230 kV line	APS	15.00	To be Filed in 2008
2012-47	RS17-RS24 230 kV line	SRP	TBD	CEC Not Yet Filed
2012-48	RS24-RS22/SEV 230 kV line	SRP	TBD	CEC Not Yet Filed
2012-5	Sun Valley-TS9 500 kV line	APS, SRP, CAWCD	TBD	CEC Not Yet Filed
2012-6	Palo Verde Hub-North Gila 500 kV #2 line	APS, SRP, IID, WMIDD	110.00	CEC Approved – Decision #70127

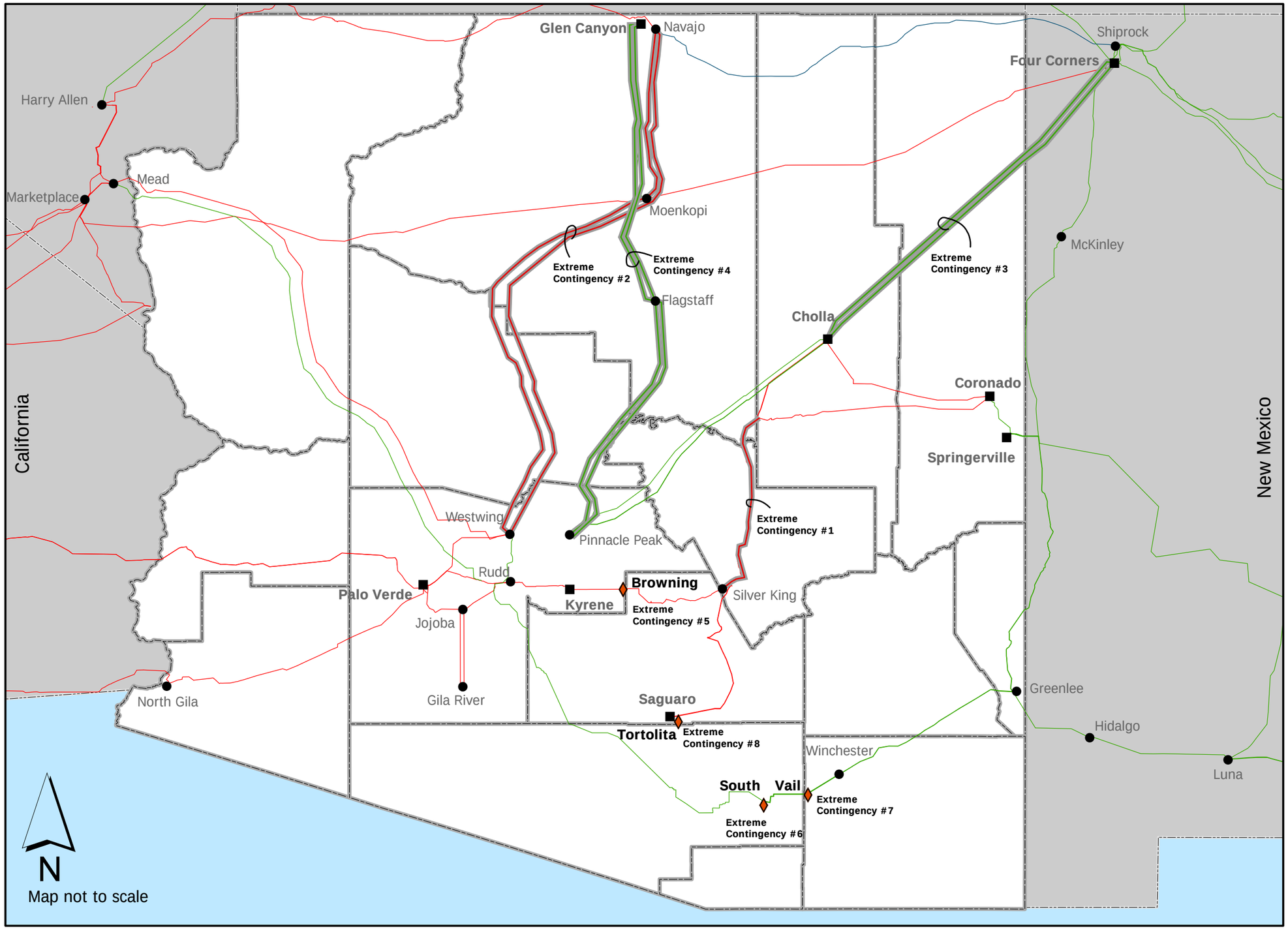
2012-83	Irvington-Tucson 138 kV Tap for future Kino substation	TEP	10.90	CEC Not Yet Filed
2012-97	Tucson-Downtown 138 kV line	TEP	1.00	CEC Not Yet Filed
2013-100	Upgrade existing 115 kV transmission line to Nogales	UNISOURCE	60.00	CEC Not Yet Filed
2013-117	CS1-Three Points 115 kV line	SWTC	0.50	CEC Not Yet Filed
2013-129	SunZia Project	SWPG, SRP, TEP, ECP, Shell	500.00	CEC Not Yet Filed
2013-38	Jojoba Loop-in of TS4-Panda 230 kV line	APS	0.95	CEC Approved – Decision #62960
2013-63	Future CS1-Bicknell 230 kV line	SWTC	21.00	CEC Not Yet Filed
2013-75	Extend Midvale-(Future) Spencer-(Future) San Joaquin 138 kV line	TEP	20.00	CEC Not Yet Filed
2013-76B	South-Duval CLEAR - Phase 2b - Extend 138 kV line from Canoa Ranch-(Future) Duval	TEP	24.00	CEC Approved - Case #84
2013-78	Irvington-Vail 138 kV #2 line	TEP	5.00	CEC Not Yet Filed
2013-84A	Tortolita-Marana-North Loop Project - Phase 1 - Tortolita-Marana 138 kV line	TEP	22.00	CEC Not Yet Filed
2013-90A	Irvington-South Project - Phase 1 - Irvington-Corona-South 138 kV line	TEP	16.10	CEC Not Yet Filed
2013-93	La Canada-Orange Grove-Rillito 138 kV line	TEP	5.40	CEC Not Yet Filed
2013-95	South-Hartt-Green Valley 138 kV line	TEP	14.50	CEC Not Yet Filed
2014-101	Gateway-Sonoita 138 kV line	UNISOURCE	10.00	CEC Not Yet Filed
2014-120A	Tortolita-Vail 345 kV Project - Phase 1 - Tortolita-North Loop line	TEP	60.00	CEC Not Yet Filed
2016-90B	Irvington-South Project - Phase 2 - Corona-SS N026-South 138 kV line	TEP	13.10	CEC Not Yet Filed
2016-96	Hartt-SS N029 138 kV line	TEP	7.10	CEC Not Yet Filed
2017-94	Orange Grove-SS N06 138 kV line	TEP	3.60	CEC Not Yet Filed
2018-90C	Irvington-South Project - Phase 3 - Corona-Swan Southlands and Swan Southlands-SS NO 26 138 kV lines	TEP	16.10	CEC Not Yet Filed
2019-89	Midvale-SS N022-South 138 kV line	TEP	13.00	CEC Not Yet Filed
2020-80B	Vail-SSNO27-Cienega-SSNO22-Spanish Trail Project - Phase 2 - Vail-SSN027 138 kV line	TEP	5.30	CEC Not Yet Filed
2020-99	Vail-SS N017-Irvington 138 kV line	TEP	10.00	CEC Not Yet Filed
2023-80C	Vail-SSNO27-Cienega-SSNo22-Spanish Trail Project - Phase 3 - Cienega-SSN020 138 kV line	TEP	14.00	CEC Not Yet Filed

2023-84B	Tortolita-Marana-North Loop Project - Phase 2 - Marana-SSN01-North Loop 138 kV line	TEP	13.50	CEC Not Yet Filed
2026-98	DeMoss Petrie-SS N014-Northeast 138 kV line	TEP	13.50	CEC Not Yet Filed
2030-88	North Loop-SS N04-Demoss Petrie 138 kV line	TEP	15.80	CEC Not Yet Filed
TBD-10	Hassayampa - Pinal West 500 kV #2 line	SRP, TEP, SWTC,ED2,ED3, ED4	51.00	CEC Approved – Case #124
TBD-103	RS26-Fountain Hill substation	SRP	TBD	CEC Not Yet Filed
TBD-104	Nogales Transmission line #2	UNISOURCE	3.00	CEC Approved - Case #111
TBD-105	Point on Kearny-Hayden 115 kV line to Future Hayden	SRP	0.75	CEC Not Yet Filed
TBD-130	Gila Bend Power Plant	GBPP	0.00	CEC Approved – Case#109 – Extension Expires 4/2011
TBD-131	Hassayampa-Jojoba 500 kV line	GBPP	19.00	CEC Approved – Case#119 – Extension Request Pending
TBD-132	Test Track-Empire-ED4 230 kV line	WAPA,SCWPDA	20.00	CEC Not Required
TBD-133	Wellton-Mohawk 230 kV Line Project	WMIDD	35.00	CEC Not Yet Filed
TBD-15	Tortolita-Winchester 500 kV line	TEP	80.00	CEC Approved - Case #23
TBD-16	Gateway 345/115 kV or 345/138 kV substations	UNISOURCE	0.00	CEC Approved - Case #111
TBD-19	Greenlee switching station through Hidalgo to Luna	ELPE,PNM, TXNMPC	28.00	CEC Approved – Case #21
TBD-21	Winchester-Vail 345 kV line - 2nd circuit	TEP	40.00	CEC Not Yet Filed
TBD-22	Vail-South 345 kV line - 2nd circuit	TEP	14.00	CEC Not Required
TBD-2-20B	Tortolita-Vail 345 kV Project - Phase 2 - North Loop-East Loop line	TEP	0.00	CEC Not Yet Filed
TBD-23	Springerville-Greenlee 345 kV line - 2nd circuit	TEP	110.00	CEC Not Yet Filed
TBD-24	Tortolita-South 345 kV line	TEP	68.00	CEC Approved - Case #50
TBD-25	Westwing-South 345 kV line - 2nd circuit	TEP	178.00	CEC Approved - Case #15
TBD-26	Interconnection line -South-future Gateway 345 kV line	TEP, UNISOURCE	60.00	CEC Approved - Case #111
TBD-27	Future Gateway-Comision Federale de Electricidad 345 kV line	TEP	2.00	CEC Approved - Case #111
TBD-31-B	Sun Valley-TS1 - 230 kV line # 2	APS	15.00	CEC Approved – Decision #68063
TBD-3-20C	Tortolita-Vail 345 kV Project - Phase 3 - East Loop-Vail line	TEP	0.00	CEC Not Yet Filed
TBD-32-B	Palm Valley-TS2-TS1 230 kV line # 2	APS	12.00	CEC Approved – Decision #67828
TBD-39	Sun Valley-TS11-Buckeye 230 kV line	APS	TBD	CEC Not Yet Filed
TBD-40	Sun Valley-TS10-TS11 230 kV line	APS	TBD	CEC Not Yet Filed
TBD-41	Sun Valley-TS9 230 kV line	APS	TBD	To be filed in 2008

TBD-42	North Gila-Yucca 230 kV line	APS	TBD	CEC Not Yet Filed
TBD-43	Yucca-TS8 230 kV line	APS	TBD	CEC Not Yet Filed
TBD-44	Westwing-El Sol 230 kV line	APS	11.00	CEC Approved – Docket#U-1345
TBD-45	Westwing-Raceway 230 kV line	APS	7.00	CEC Approved – Decision#64473
TBD-49	RS17 230 kV Loop-in line	SRP	0.95	CEC Approved - Decisions #59791 and #60099
TBD-50	Dinosaur-RS21 230 kV line	SRP	TBD	CEC Not Yet Filed
TBD-51	Rogers-Browning 230 kV line	SRP	9.00	CEC Not Yet Filed
TBD-52	Silver King-Browning 230 kV line	SRP	38.00	CEC Approved - Case #20
TBD-53	Silver King-Browning/Superior 230 kV tie	SRP	0.50	CEC Not Yet Filed
TBD-54	Westwing-Pinnacle Peak 230 kV line	APS, SRP	22.00	CEC Approved – Decision #64473
TBD-55	Pinnacle Peak-Brandow 230 kV line	SRP	TBD	CEC Approved - Case #69
TBD-56	Rogers-Corbell 230 kV line	SRP	12.00	CEC Not Required
TBD-57	Silver King-Knoll-Future Hayden 230 kV line	SRP	35.00	CEC Not Yet Filed
TBD-58	Santa Rosa-ED5 230 kV line	SCWPDA, SPPR	38.00	CEC Not Yet Filed
TBD-59	ED5-Pinal South (Pinal Central) 230 kV line	SCWPDA, SPPR	18.00	CEC Not Yet Filed
TBD-60	ED5-Marana 230 kV line	SCWPDA, SPPR	28.00	CEC Not Yet Filed
TBD-61	Pinal Central (Pinal South) - Future substation 6 miles northeast 230 kV line #1	SCWPDA, SPPR	6.00	CEC Not Yet Filed
TBD-62	Pinal Central (Pinal South) - Future substation 6 miles northeast 230 kV line #2	SCWPDA, SPPR	6.00	CEC Not Yet Filed
TBD-64	Upgrade of Apache-Butterfield 230 kV line	SWTC	16.00	CEC Not Yet Filed
TBD-65	Future Sloan-Huachuca 230 kV line	SWTC	24.00	CEC Not Yet Filed
TBD-7	Palo Verde-Saguaro 500 kV line	CATS Sub-regional Planning Group	130.00	CEC Approved – Decision#46802
TBD-70	Valencia 115 kV substation expansion	UNISOURCE	0.00	CEC Approved - Case #111
TBD-71C	Irvington-East Loop Project - Phase 3 - Irvington-22nd Street 2nd Circuit	TEP	9.00	CEC Approved - Case #66
TBD-72C	Vail-East Loop - Phase 3 - Third Vail-East Loop 138 kV line	TEP	22.00	CEC Approved - Case #8
TBD-72D	Vail-East Loop - Phase 4 - Harrison Tap of Roberts-East Loop 138 kV line	TEP	0.00	CEC Approved - Case #8
TBD-73	East Loop-Northeast 138 kV line	TEP	13.00	CEC Approved - Case #47
TBD-79	Tortolita-Rillito 138 kV line	TEP	24.50	CEC Not Yet Filed
TBD-8	Arlington Power Plant	Dynegy Arlington Valley	TBD	CEC Approved – Decision #64357
TBD-81	Future Cienega-Mountain View 138 kV line	TEP	4.70	CEC Not Yet Filed

Arizona Extreme Contingency Map

Exhibit 7



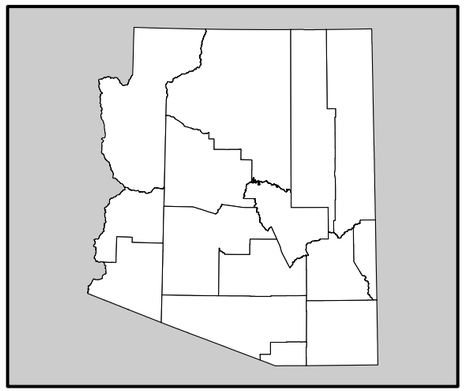
Legend

Facilities

- Existing Power Plant
- Existing Substation
- Extreme Substation Contingency

Transmission

- 500 kV AC Existing
- 345 kV AC Existing
- 230 kV AC Existing
- 500 kV Cooridor Extreme Contingency
- 345 kV Cooridor Extreme Contingency



Notes

1. Only pertinent transmission voltage levels shown
2. Outage identificationrefers to details on Exhibit 7 tables

ACC Docket #E-00000D-07-0376
5th Bienniel Transmission Assessment

DISCLAIMER:
K.R. Saline & Associates P.L.C.
Does not warrant the accuracy or location of the facilities shown

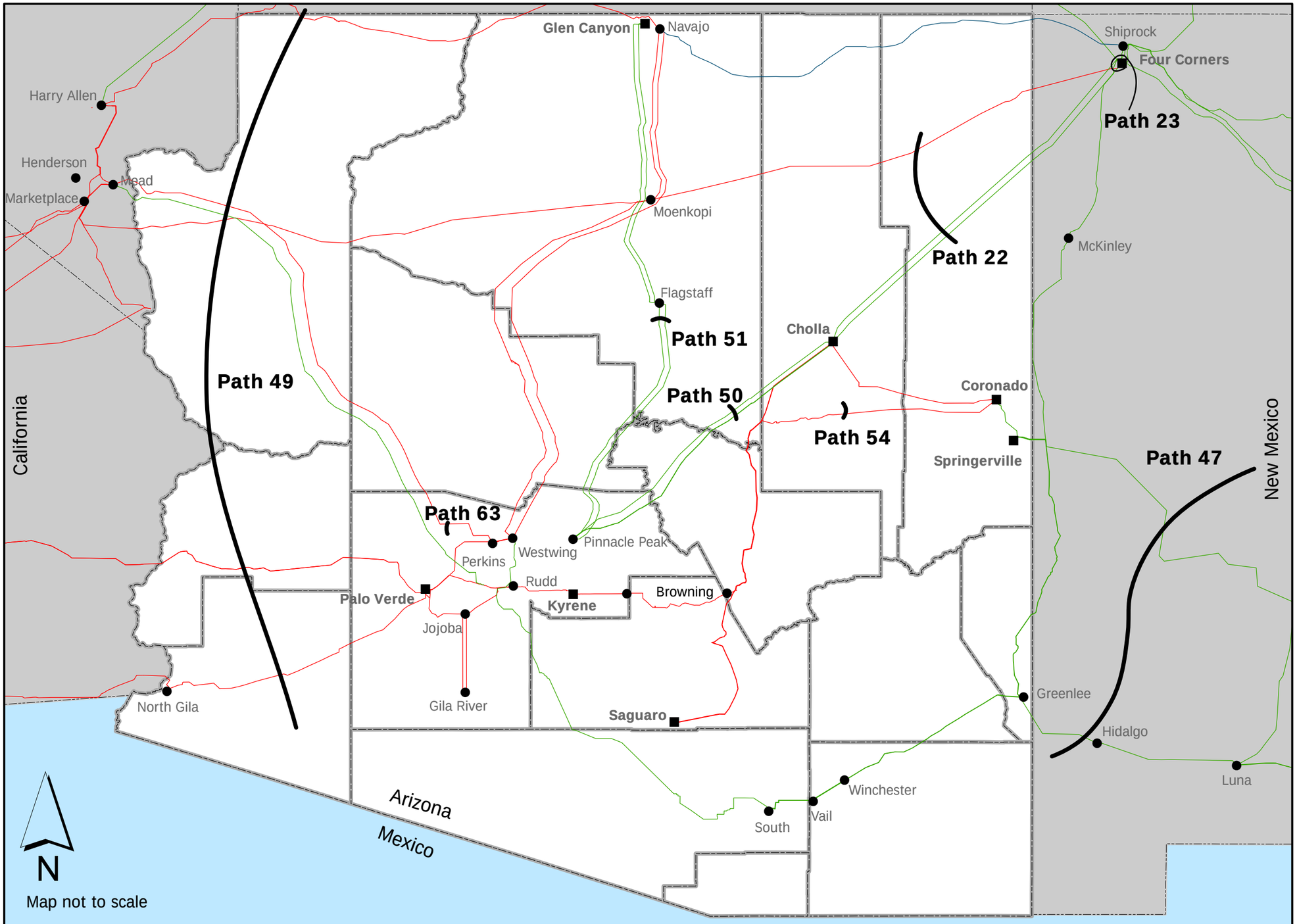
G:\ACC\2008\BTA\Report\BTA report\2008 Draft\maps\AZ_Ext_Cont_v6.mxd

Extreme Contingency Listing

Reference	Outage(s)
1	Cholla-Saguaro and Coronado-Silverking 500kV lines
2	Navajo South 500kV lines
3	Four Corners-Cholla-Pinnacle Peak 345kV lines
4	Glen Canyon-Flagstaff-Pinnacle Peak 345kV lines
5	Browning 500/230 kV Transformer Bank
6	EHV Transformers at South
7	EHV Transformers at Vail
8	EHV Transformers at Tortolita

WECC Paths Affecting Arizona Map

Exhibit 8



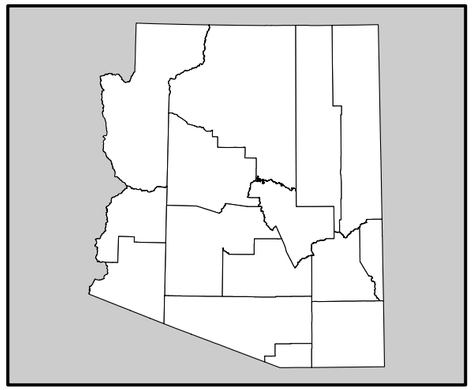
Legend

Facilities

- Existing Power Plant
- Existing Substation

Transmission

- 500 kV AC Existing
- 345 kV AC Existing
- 230 kV AC Existing



Notes

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1. Only pertinent transmission voltage levels shown
2. Path identification refers to details on Exhibit 8 tables

ACC Docket #E-00000D-07-0376
5th Bienniel Transmission Assessment

DISCLAIMER:
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Does not warrant the accuracy or location of the facilities shown

WECC Path Information[1]

WECC Path	WECC Path Name	Components	Rating
22	Southwest of Four Corners	Four Corners - Moenkopi 500 kV	2325 MW (nominal)
		Four Corners - Cholla 345 kV #1	
		Four Corners - Cholla 345 kV #2	
23	Four Corners 345/500 Qualified Path	Flow on 345/500 Transformer	345 to 500: 840 MVA
			500 to 345: 840 MVA
47	Southern New Mexico	West Mesa - Arroyo 345 kV	940 MW (Simultaneous Firm)
		Springerville - Luna 345 kV	1048 MW (Non-simultaneous)
		Greenlee - Hidalgo 345 kV	
		Belen - Bernardo 115 kV	
48	Northern New Mexico	Four Corners - West Mesa 345 kV	1849 MW (Simultaneous Firm)
		San Juan - BA 345 kV	1970 MW (Non-simultaneous)
		San Juan - Ojo 345 kV	
		McKinley/Yah-Ta-Hey 345/115 kV Transformer	
		Walsenburg - Gladstone 230 kV	
		Bisti - Ambrosia230 kV	
49	East of River (EOR)	Navajo - Crystal - McCullough 500 kV	8055 MW (Non-simultaneous)
		Moenkopi - El Dorado 500 kV	
		Liberty - Peacock - Mead 500 kV	
		Palo Verde - Devers 500 kV	
		Hassayampa - North Gila 500 kV	
		Perkins - Mead 500 kV	
50	Cholla - Pinnacle Peak	Cholla - Pinnacle Peak 345 kV # 1	East to West: 1200 MW
		Cholla - Pinnacle Peak 345 kV # 2	West to East: Not Rated
51	Southern Navajo	Moenkopi - Yavapai 500 kV	North to South: 3200 MW
		Navajo - Westwing 500 kV	South to North: Not Rated
54	Coronado - Silver King	Coronado - Silver King 500 kV	East to West: 1133 MW
			West to East: Not Rated
63	Perkins - Mead 500 kV Line (Part of Path 49)	Mead - Perkins 500 kV	East to West: 1300 MW
		Mead 500/230 Transformer	West to East: Not Rated
		Perkins Phase Shifters	

[1] WECC 2008 Path Rating Catalog, http://www.wecc.biz/documents/library/reports/2008/Path2008_Final_0208.pdf

Exhibit 9 – Navajo Transmission Project Map

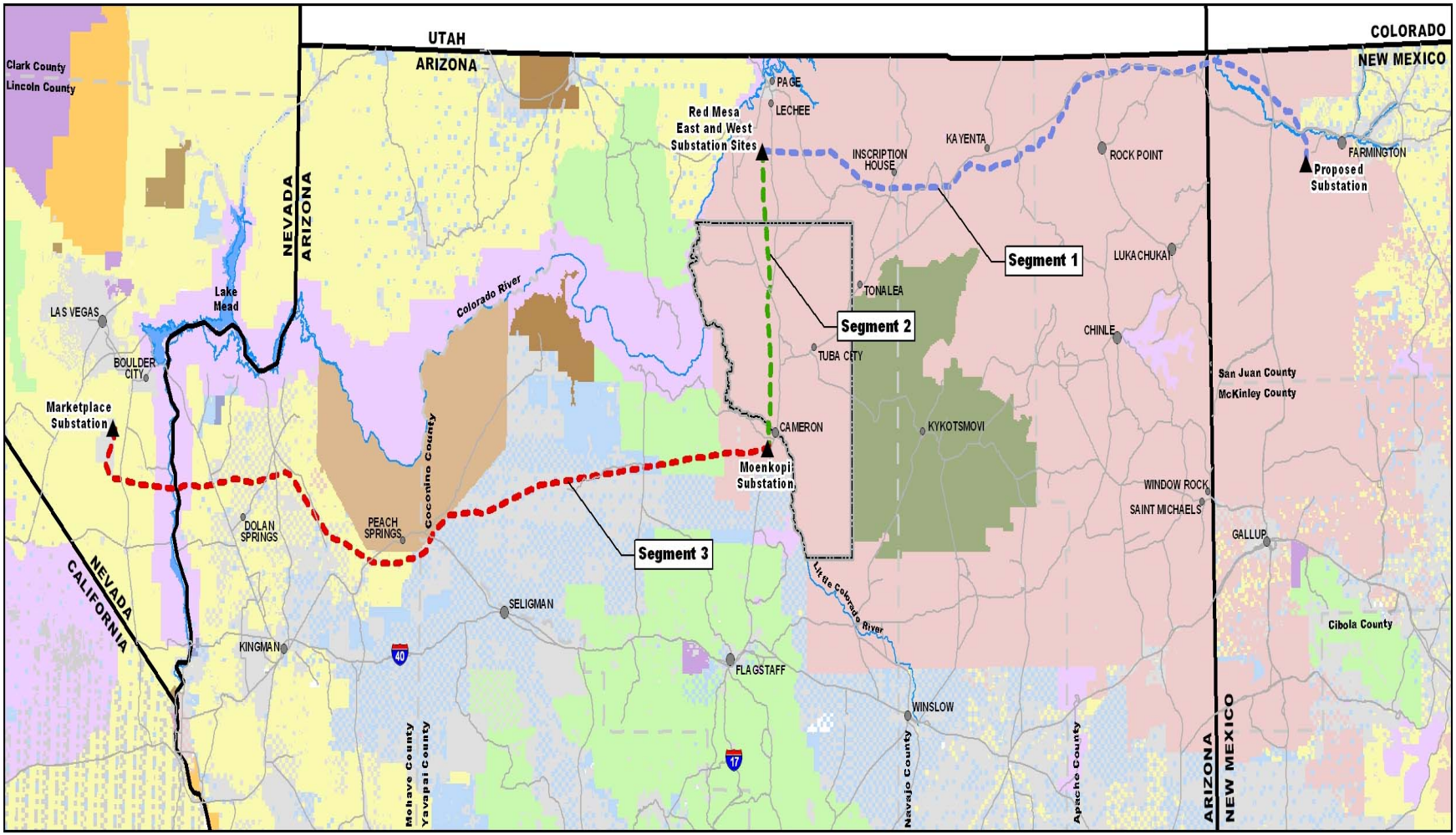


Exhibit 10 – Palo Verde-Devers 2 Transmission Line Project Map

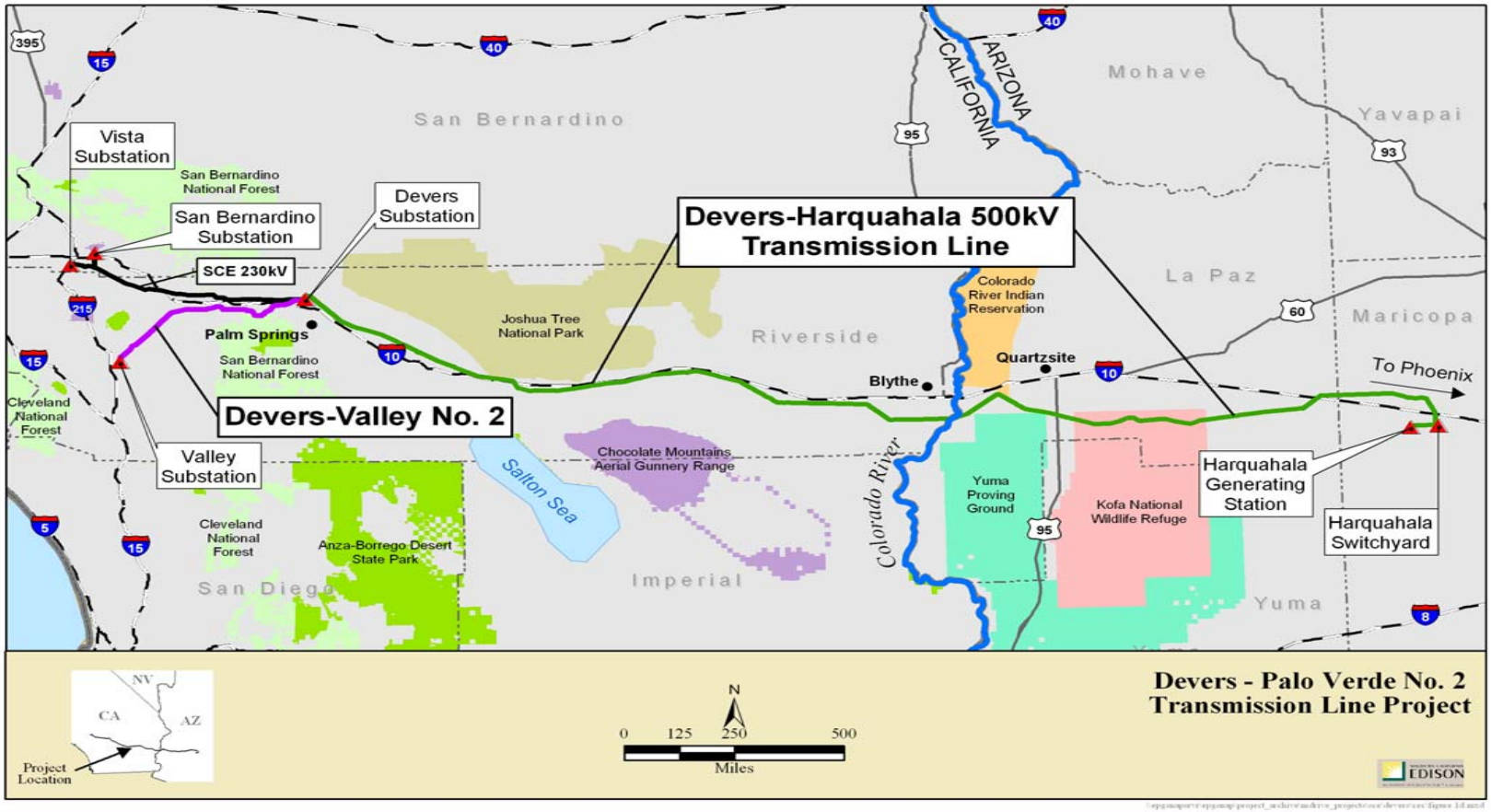


Exhibit 11 – Harcuvar Project Map

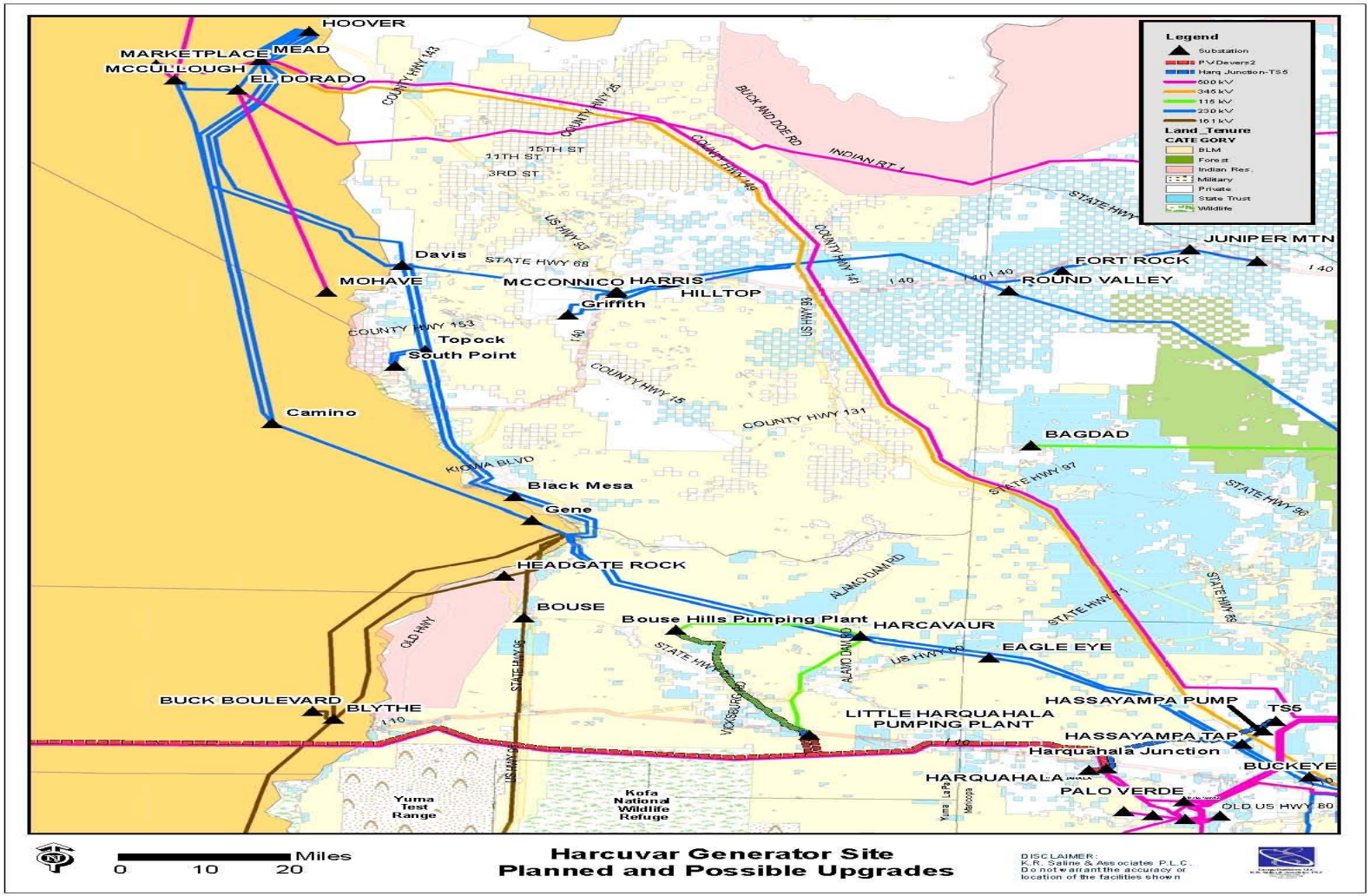


Exhibit 12 – Wellton-Mohawk Project Map

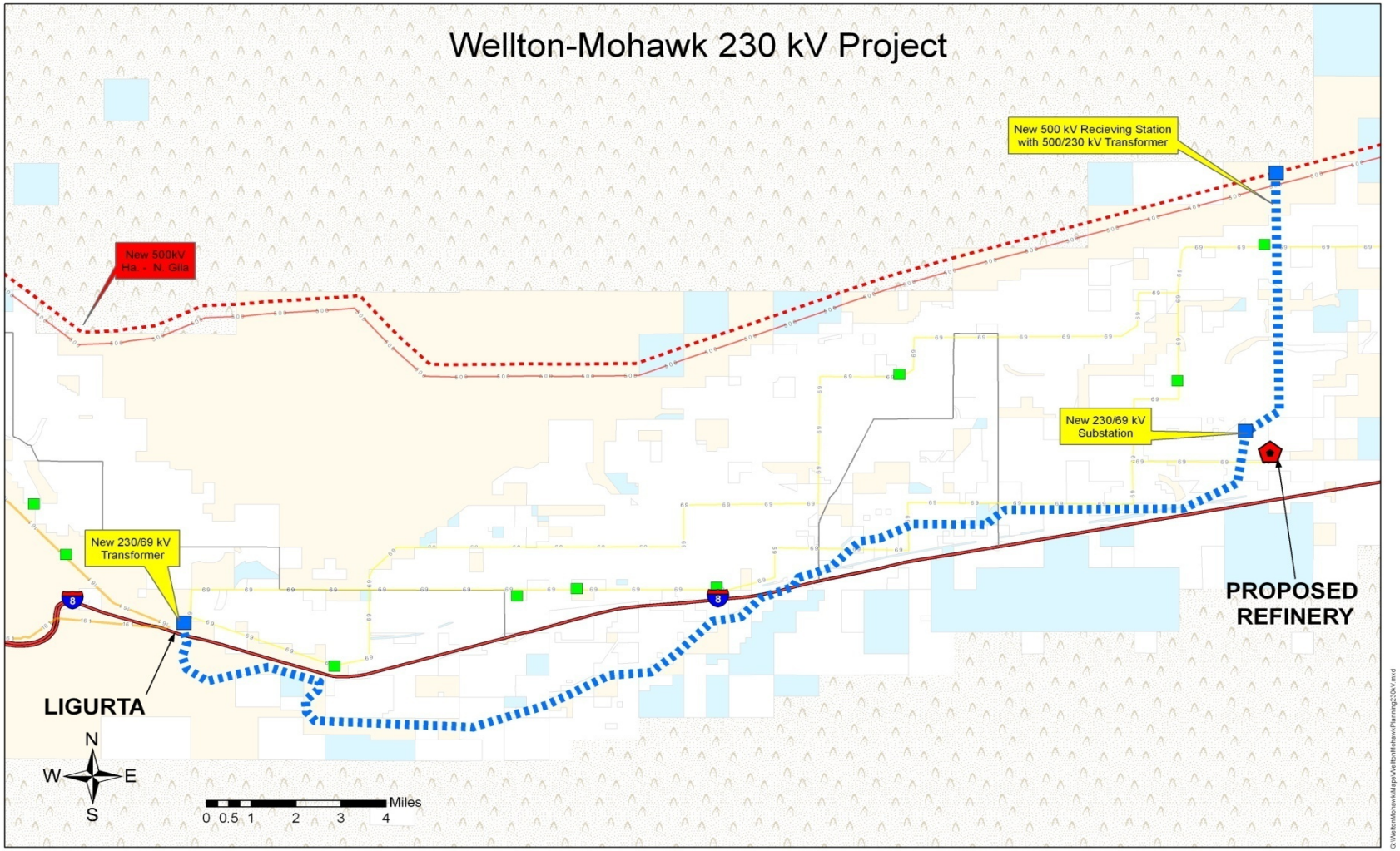


Exhibit 13 – Three Terminal Project Map

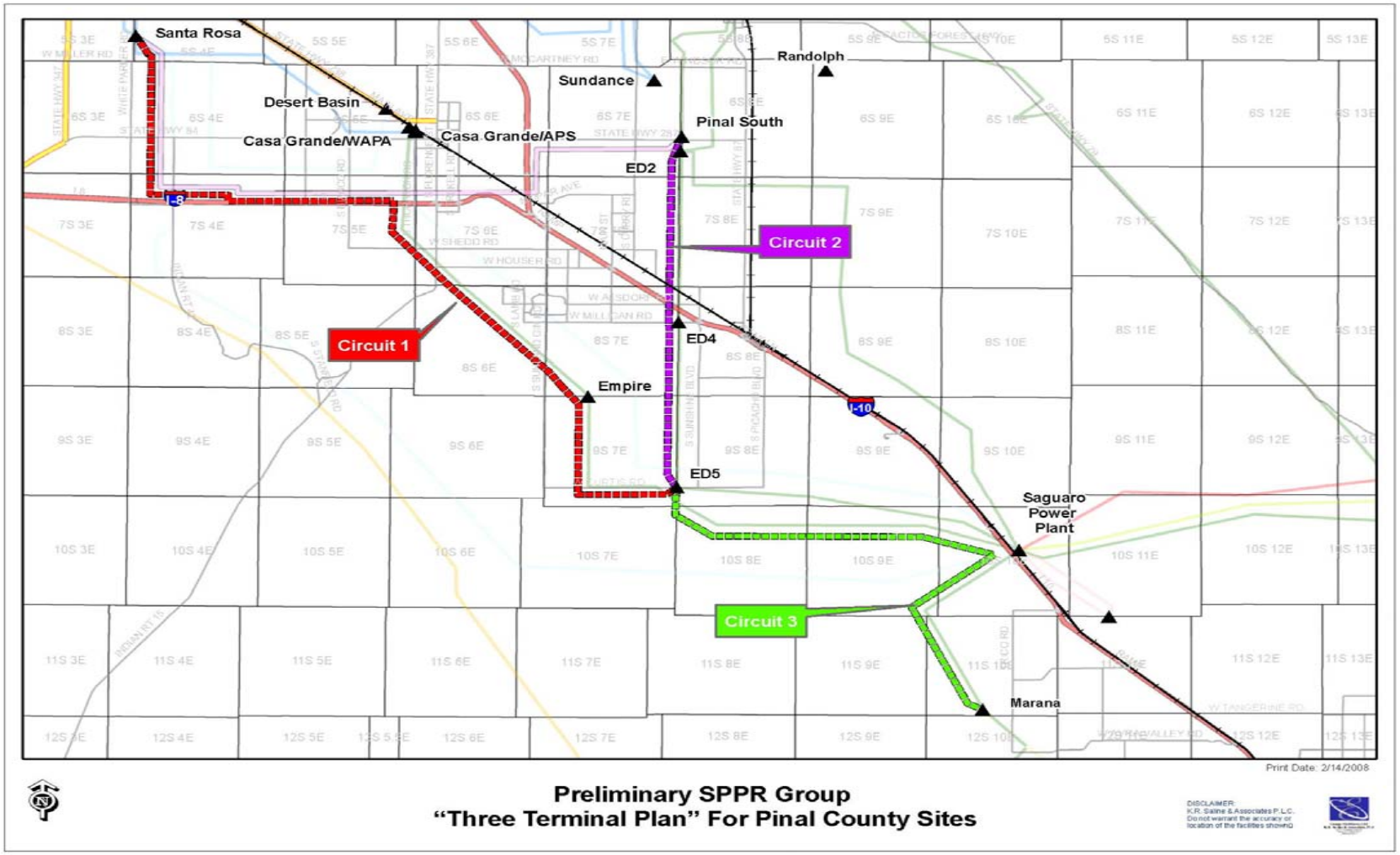


Exhibit 14 – Bowie Power Project Map

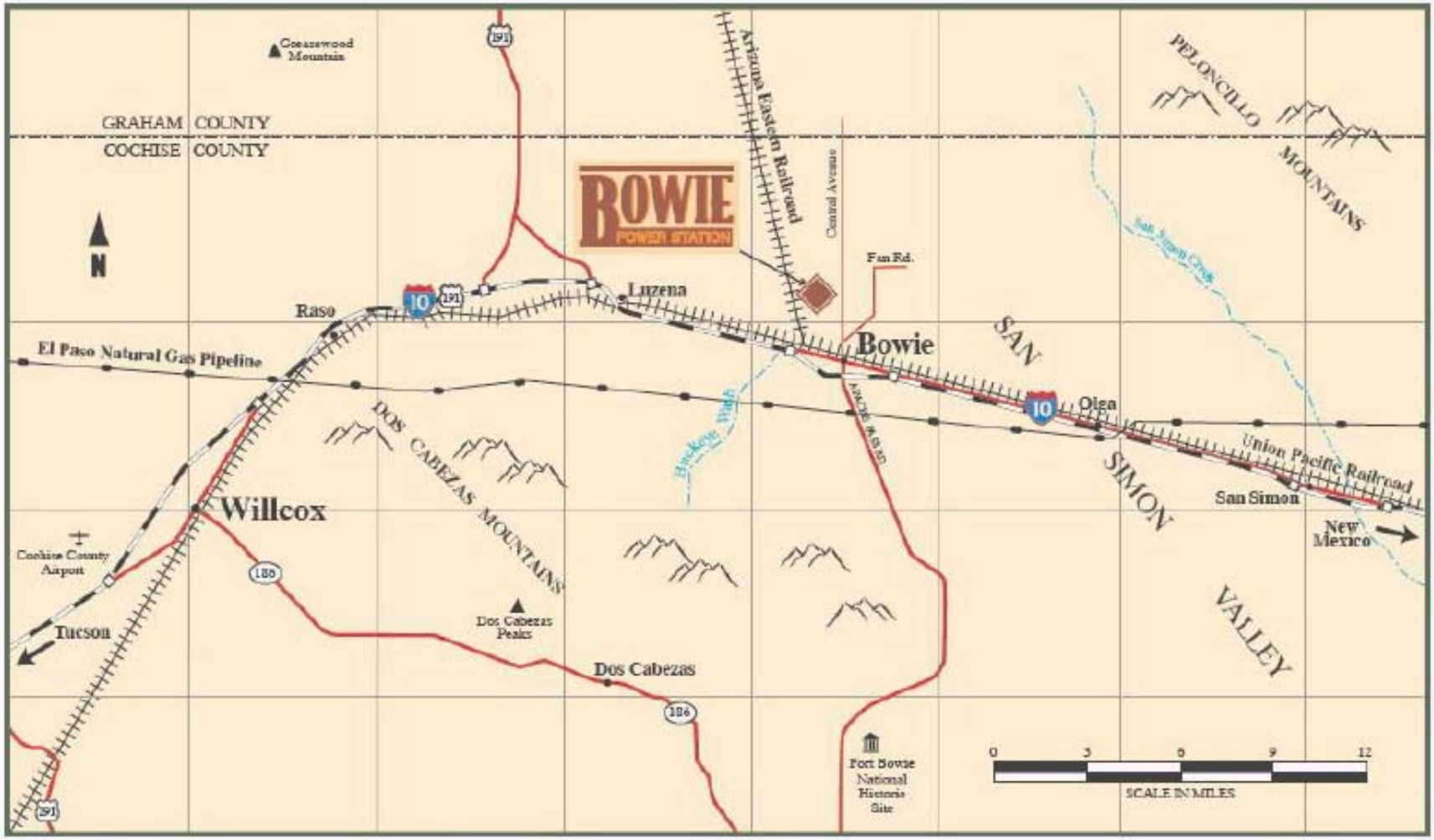


Exhibit 15 – SunZia Project Map

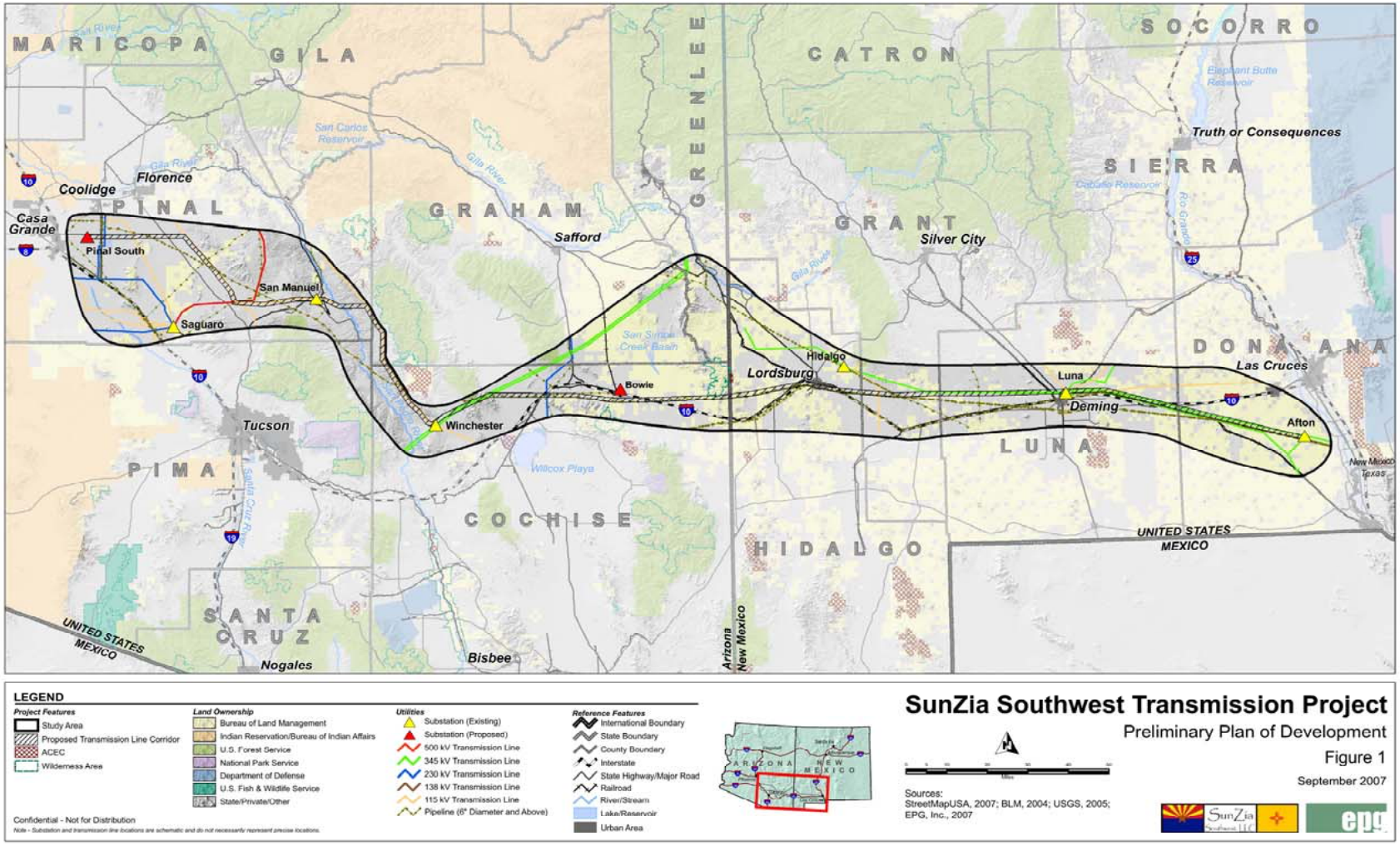


Exhibit 16 – High Plains Express Project Map

Exhibit 17 – TransWest Express Project Map

Exhibit 18 – Plan Changes Between Fourth and Fifth BTA

In-Service Date	Project	Voltage	Status
2006	Saddlebrooke Ranch	115 kV	Completed
2006	Vail -East Loop Line through Pantano and Los Reales Substations Phase 2	138 kV	Completed
2006	South – Duval CLEAR – Phase 2a – Green – Canoa Ranch line	138 kV	Completed
2007	Rudd-Palm Valley-TS4 230KV	230 kV	Completed
2007	Palm Valley 230/69KV Substation	230/69 kV	Completed
2007	Hackberry 230/69 Substation	230/69 kV	Completed
2007	Loop-In of Liberty to Orme into Rudd and new Orme to Anderson Line	230kV	Completed
2007	Browning-Dinosaur	230kV	Completed
2008	Tortolita - North Loop - Rancho Vistoso Project - Tortolita to North Loop Phase 1	138 kV	New Project - 2008
2008	Northeast 138 kV Static Var Compensator (SVC)	138 kV	New Project - 2008
2008	Loop existing West Ina Substation to Tucson Substation	138 kV	Changed In-Service date from 2007 to 2008
2008	Gateway - Sonoita 138kV transmission line	138 kV	New Project - TBD
2008	Golden Valley 230kV Project	230 kV	New Project - 2008
2008	Palo Verde - Pinal West	500kV	Due for Completion in 2008
2009	Valencia to CAP Black Mountain 115kV line	115 kV	Changed In-Service date from 2011 to 2009
2009	Saguaro to Naviska 115kV line	115 kV	Changed In-Service date from 2008 to 2009
2009	CAP 115 kV line loop-in to SWTC Sandario	115 kV	Changed In-Service date from 2012 to 2009
2009	Tortolita - North Loop - Rancho Vistoso Project - North Loop to Rancho Vistoso Phase 2	138 kV	New Project - 2009
2009	Western 115kV line loop-in to Pantano	115 kV	New Project - 2009
2009	Milligan loop-in of Saguaro-Casa Grande 230 kV line	230 kV	New Project - 2009
2009	Milligan 230/69 kV Substation	230/69 kV	New Project - 2009
2009	Sugarloaf(Second Knoll) loop-in of Coronado-Cholla 500 kV line	500 kV	Project Name Change
2010	Thornydale to Rattlesnake 115kV line	115 kV	Changed In-Service date from 2012 to 2010
2010	Naviska to Thornydale 115kV line	115 kV	Changed In-Service date from

			2009 to 2010
2010	Marana to Avra Valley 115kV Line Upgrade	115 kV	Changed In-Service date from 2015 to 2010
2010	Tortolita - North Loop - Rancho Vistoso Project - Corridor Expansion Phase 3	138 kV	New Project - 2010
2010	Rancho Vistoso Substation to future Catalina Substation	138 kV	Changed In-Service date from 2009 to 2010
2010	Vail - Cienega Substations – Phase 1	138 kV	New Project - 2010
2010	North Loop Substation - Rancho Vistoso Substation 138kV tap for new Naranja Substation	138 kV	New Project - 2010
2010	DeMoss Petrie Substation - Tucson Substation 138 kV	138 kV	New Project - 2010
2010	Trilby Wash(TS1)-TS2-Palm Valley 230kV	230 kV	Changed In-Service date to 2010
2010	Sun Valley(TS5)- Trilby Wash(TS1) 230kV (with TS-2)	230 kV	Changed In-Service date from 2009 to 2010 (2011)
2010	Flagstaff 345/69kV interconnection	345/69 kV	Changed In-Service date from 2009 to 2010
2010	PV Hub-Sun Valley(TS5) 500kV	500 kV	Changed In-Service date from 2008 to 2010
2011	Sandario Tap to Three Points 115 kV Line Upgrade	115 kV	New Project - 2011
2011	Avra Valley to Sandario Tap 115kV Line Upgrade	115 kV	New Project - 2011
2011	Northeast - Snyder 138kV - Tap for Craycroft-Barril Substations	138 kV	New Project - 2011
2011	Sundance-Pinal South 230 kV	230 kV	New Project - 2011
2011	SE10 loop-in of Saguaro-Casa Grande 230 kV line	230 kV	New Project - 2011
2011	Desert Basin-Pinal South 230 kV	230 kV	New Project - 2011
2011	SE10 230/69 kV Sub	230/69 kV	New Project - 2011
2011	Pinal Central - SEV/RS22	230kV	New Project - 2011
2011	SEV/RS22 - Dinosaur	230kV	New Project - 2011
2011	Pinal South Substation to Tortolita Substation	500 kV	New Project - 2011
2011	Pinal South-Browning	500 kV	New Project - 2011
2011	Palo-Verde - Devers #2 Line	500 kV	Changed In-Service from 2009 to 2011
2011	Pinal West - Pinal Central	500kV	2011
2012	Marana Tap to Marana 115 kV Line Upgrade	115 kV	New Project - 2012
2012	Tucson Substation -Downtown Substation	138 kV	New Project - 2012
2012	Irvington Substation - Tucson 138 kV - Tap for Kino Substation	138 kV	New Project - 2012
2012	RS24 - RS22/SEV Substations	230 kV	New Project - 2012

2012	RS17 - RS24	230 kV	New Project - 2012
2012	TS6 230/69 kV Substation	230/69 kV	New Project - 2012
2012	Series Capacitor Upgrade Project - Moenkopi-El Dorado 500kV	500 kV	Changed In-Service date from 2010 to 2012
2013	CS1 to Three Points 115kV line	115 kV	New Project - 2013
2013	South to Duval CLEAR-Phase 2b - Extend 138kV line from Canoa Ranch to future Duval	138 kV	New Project - 2013
2013	South Substation - Hartt Substation - Green valley Substation 138kV	138 kV	New Project - 2013
2013	Phase 1:Tortolita - Marana/Marana North Loop	138 kV	New Project - 2013
2013	Phase 1: Irvington - Corona Substation/Corona - South Substation	138 kV	New Project - 2013
2013	Loop existing Irvington to Vail Substation #2 line	138 kV	Changed In-Service date from 2011 to 2013
2013	Upgrade existing 115kV transmission line to Nogales	115 kV	Changed In-Service date from 2012 to 2013
2013	La Canada - Orange Grove - Rillito Substations 138kV	138 kV	New Project - 2013
2013	Extend 138kV line from Midvale through future Spencer to future San Joaquin	138 kV	Changed In-Service date from TBD to 2013
2013	Jojoba cut-in of TS4-Panda 230kV	230 kV	Changed In-Service date from 2011 to 2013
2013	Griffith - North Havasu 230 kV	230 kV	Changed In-Service date from TBD to 2008
2013	Future CS1 to Bicknell 230kV line	230 kV	New Project - 2013
2013	Avery 230/69 kV Substation	230/69 kV	New Project - 2013
2014	Tortolita Substation to Vail Substation - Phase 1	345 kV	New Project - 2014
2014	RS26 - Fountain Hill Substation	Under Review 115kV or 230kV	New Project - 2014
2016	Phase 2: Corona - SS N026 Substations/SS N026 - South Substations	138 kV	New Project - 2016
2016	Hartt Substation -SS N029 Substation 138 kV	138 kV	New Project - 2016
2017	Orange Grove Substation -SS N06 Substation	138 kV	New Project - 2017
2018	Phase 3: Corona - Swan Southlands Substations/Swan Southlands	138 kV	New Project - 2018
2019	Midvale Substation - SS N022 Substation - South Substation 138 kV	138 kV	New Project - 2019
2020	Vail Substation - SS N017 - Irvington Substation 138kV	138 kV	New Project - 2020
2020	Vail - SSN027 Substations - Phase 2	138 kV	New Project - 2020
2023	Cienega - SSN020 Substations - Phase 3	138 kV	New Project - 2023

2023	Marana - SSN01/SSN01 - North Loop - Phase 2	138 kV	New Project - 2023
2026	DeMoss Petrie Substation - SS N014 Substation - Northeast Substation 138kV	138 kV	New Project - 2026
2030	North Loop Substation - SS N04 Substation - DeMoss Petrie Substation	138 kV	New Project - 2030
TBD	Point on the Kearny - Hayden 115kV line to Future Hayden	115 kV	New Project - TBD
TBD	New Cienega Substation- Mountain View Substation	138 kV	New Project - TBD
TBD	Westwing -Pinnacle Peak	230 kV	New Project - TBD
TBD	Upgrade of Apache to Butterfield 230kV line	230 kV	New Project - TBD
TBD	SunValley-TS11-Buckeye 230 kV	230 kV	New Project - TBD
TBD	SunValley-TS10-TS11 230 kV	230 kV	New Project - TBD
TBD	Sun Valley–TS9 230kV line	230 kV	New Project - TBD
TBD	Silver King - Knoll - Future Hayden	230 kV	New Project - TBD
TBD	Silver King - Browning 230kV/Superior Tie	230 kV	New Project - TBD
TBD	Silver King - Browning	230 kV	New Project - TBD
TBD	Santa Rosa Substation - ED5 Substation	230 kV	New Project - TBD
TBD	RS17 Loop-in	230 kV	New Project - TBD
TBD	Rogers - Corbell	230 kV	New Project - TBD
TBD	Rogers - Browning	230 kV	New Project - TBD
TBD	Pinnacle Peak -Brandow	230 kV	New Project - TBD
TBD	Pinal South to a Future Substation 6 miles northeast of Pinal South #2	230 kV	New Project - TBD
TBD	Pinal South to a Future Substation 6 miles northeast of Pinal South #1	230 kV	New Project - TBD
TBD	North Gila-Yucca 230 kV	230 kV	New Project - TBD
TBD	Future Sloan Substation to Huachuca 230kV line Substation	230 kV	New Project - TBD
TBD	ED5 - Pinal South (Pinal Central)	230 kV	New Project - TBD
TBD	ED5 - Marana	230 kV	New Project - TBD
TBD	Dinosaur - RS21	230 kV	New Project - TBD
TBD	Tortolita Substation to Vail Substation - Phase 3	345 kV	New Project - TBD
TBD	Tortolita Substation to Vail Substation - Phase 2	345 kV	New Project - TBD
TBD	Future Gateway Substation to Comision Federale de Electricidad	345 kV	New Project - TBD
TBD	Hassayampa - Pinal West #2	500 kV	New Project - TBD

Exhibit 19 – Listing of Queue Interconnection Generation Projects

Interconnecting Utility	Maximum Output	Interconnection Location	In-Service Date	Technology
APS	Unit 1 - 700	Four Corners 500 Switchyard	1/1/2012	Coal
	Unit 2 - 700		4/1/2012	Coal
APS	128	Cholla/ Zeniff/Show Low Western 69 kV line and Cholla / Show Low Eastern 69 kV line	West = 8/17/2009	Wind
			East = 10/1/2010	Wind
APS	22	Cholla/ Zeniff/Show Low Western 69 kV line	Q2 2008	Biomass
APS	100	Existing Yucca 69 kV Substation	6/1/2008	Gas Combustion turbine
APS	Units 1-4 - 583 each (63 MW Net Increase per Unit)	Gila River 500 kV		Gas Combined Cycle
APS	270	Ashfork-Pollock 69 kV System and Seligman 230 kV to be studied	12/31/2008	Wind
APS	125	Cholla / Show Low Eastern 69 kV line	11/1/2009	Wind
APS	100	Adams - Mural 115 kV line	12/31/2010	Wind
APS	102	Proposed Harquahala Junction (Delaney) Switchyard	10/1/10-12/1/2011	Solar
APS	102	Panda Liberty 230 kV or Panda Substation	10/1/10-12/1/2011	Solar
APS	400	North Gila Substation	12/31/2010	Solar
APS	1000	Moenkopi 500 kV	7/1/2010	Wind
APS	300	Cholla-Pinnacle Peak 345 kV line	11/1/2010	Wind
APS	400	Proposed Harquahala Junction (Delaney) Switchyard	7/31/2011-12/31/2012	Solar
APS	800	Proposed Harquahala Junction (Delaney) Switchyard	1/1/2013-12/31/2014	Solar
APS	500	Moenkopi -El dorado 500 kV line	7/1/2010	Wind
APS	250	North Gila Substation	Q4 2012	Solar Thermal
APS	500	Proposed Harquahala Junction (Delaney) Switchyard	6/30/2012	Solar
APS	500	Proposed PV-NG2 500 kV line	6/30/2012	Solar
			6/30/2013	Solar
APS	280	Gila Bend 230 kV Substation	12/1/2011	Solar

SRP	150	CO-CH,CO-SK500 kV	3/1/2007	Wind
SRP	562	New 230 line, SEVP	9/1/2010	Natural Gas
TEP	430	Springerville, AZ	Q2 2004	Generator
UNSE	80	Dolan Springs Substation	9/12/2005	Wind
TEP	95	Between Coronado and Springerville Power Plants	12/31/2007	Wind
TEP	500	Greenlee-Vail 345 kV Line	N/A	Wind
TEP	700	Various	12/31/2010	Wind
TEP	700	Various	12/31/2010	Wind
TEP	250	South-Green Valley 138 kV Line	4Q 2012	Solar
WAPA	500	Tap on 345 kV Glen Canyon-Pinnacle Peak transmission system	12/31/2008	Wind Turbine Wind
WAPA	180	Griffith Switchyard 230 kV	6/1/2008	Gas Turbine Natural Gas
WAPA	300	Mead - Davis 230 kV Line	12/31/2009	Wind Turbine Wind
WAPA	65.1	Goldmine Tap Substation	12/31/2008	Wind Turbine Wind
WAPA	500	Peacock Substation	12/31/2008	Wind Turbine Wind

Exhibit 20 – Listing of Projects by In-Service Date

In-Service Date	Description	Voltage	Participants	Permitting/Status
2008	Hassayampa - Pinal West #1	500 kV	SRP, TEP, SWTC,ED2,ED3, ED4	CEC Approved – Case #124
2008	Griffith - North Havasu Transmission	230 kV, 69 kV	UNISOURCE	CEC Approved/Extended - Case #88
2008	Golden Valley 230 kV Project - McConico-Mercator Mill substations	230 kV	UNISOURCE	CEC Not Yet Filed
2008	Loop existing West Ina substation to Tucson substation	138 kV	TEP	CEC Approved - Case #62
2008	Northeast 138 kV Static Var Compensator (SVC)	138 kV	TEP	CEC Not Required
2008	Tortolita - North Loop - Rancho Vistoso Project - Tortolita to North Loop Phase 1	138 kV	TEP	CEC Not Yet Filed
2008	Apache/Hayden to San Manuel 115 kV line	115 kV	SWTC	CEC Not Yet Filed
2009	Sugarloaf loop-in of Coronado-Cholla 500 kV line	500 kV	APS, SRP	Not Required
2009	VV01 loop-in of Navajo-Westwing 500 kV line	500 kV	APS	Not Required
2009	Milligan loop-in of Saguaro-Casa Grande 230 kV line	230 kV	APS	Not Required
2009	Tortolita - North Loop - Rancho Vistoso Project - North Loop to Rancho Vistoso Phase 2	138 kV	TEP, SWTC	CEC Not Yet Filed
2009	Western 115 kV line loop-in to Pantano	115 kV	SWTC	CEC Not Required
2009	Saguaro to Naviska 115 kV line	115 kV	SWTC	CEC Not Yet Filed
2009	Valencia to CAP Black Mountain 115 kV line	115 kV	SWTC	CEC Not Yet Filed
2009	CAP 115 kV line loop-in to SWTC Sandario	115 kV	SWTC	CEC Not Required
2010	Palo Verde Hub-Sun Valley 500 kV line	500 kV	APS, SRP, CAWCD	CEC Approved – Decision #68063
2010	TS9-Pinnacle Peak 500 KV line	500 kV	APS, SRP	CEC Approved – Decision #69343
2010	White Hills substation	345 kV, 69 kV	UNISOURCE	CEC Not Required
2010	Bowie Power Project	345 kV	BOWIE	CEC Approved – Decisions #64626 and 69339
2010	345/69 kV Interconnection at Western's Flagstaff 345 kV bus	345 kV	APS	CEC Not Required
2010	TS9 - Raceway - Avery - TS6 - Pinnacle Peak 230 kV	230 kV	APS	CEC Approved –

	line			Decision #69343
2010	Sun Valley -TS1 - 230 kV line	230 kV	APS	CEC Approved – Decision #67828
2010	Palm Valley - TS2 - TS1 - 230 kV line	230 kV	APS	CEC Approved - Decisions #66646 and #67828
2010	Rancho Vistoso substation to future Catalina substation	138 kV	TEP	CEC Not Required
2010	Vail - SS NO27 - Cienega - SS No22- Spanish Trail Project - Phase 1 - Vail - Cienega line	138 kV	TEP	CEC Not Yet Filed
2010	North Loop substation - Rancho Vistoso substation 138 kV tap for new Naranja substation	138 kV	TEP	CEC Not Yet Filed
2010	DeMoss Petrie substation - Tucson substation 138 kV	138 kV	TEP	CEC Not Yet Filed
2010	Tortolita - North Loop - Rancho Vistoso Project - Corridor Expansion Phase 3	138 kV	TEP	CEC Not Yet Filed
2010	Marana to Avra Valley 115 kV Line Upgrade	115 kV	SWTC	CEC Not Yet Filed
2010	Naviska to Thornydale 115 kV line	115 kV	SWTC	CEC Not Yet Filed
2010	Thornydale to Rattlesnake 115 kV line	115 kV	SWTC	CEC Not Yet Filed
2011	Pinal West-Southeast Valley/Browning	500 kV	SRP, TEP, SWTC,ED2,ED3, ED4	CEC Approved - Case #126
2011	Devers - Palo Verde #2	500 kV	SCE	CEC Denied - Case #130
2011	Pinal Central-Tortolita Substation	500 kV	TEP, SWTC	CEC Not Yet Filed
2011	Mazatzal loop-in of Cholla-Pinnacle Peak 345 kV line	345 kV	APS	Not Required
2011	SE10 loop-in of Saguaro-Casa Grande 230 kV line	230 kV	APS	Not Required
2011	Sundance - Pinal South 230 kV line	230 kV	APS, ED2	CEC Filed – Case #136
2011	Pinal South- Southeast Valley/RS22	230 kV	SRP, TEP, SWTC,ED2,ED3, ED4	CEC Approved - Decisions #68093 and #69291
2011	Desert Basin - Pinal South 230 kV	230 kV	APS, SRP	CEC Approved – Decisions #68093, #68291, #69183 and #69647
2011	Northeast - Snyder 138 kV - Tap for Craycroft-Barril substations	138 kV	TEP	CEC Not Required
2011	Avra Valley to Sandario Tap 115 kV Line Upgrade	115 kV	SWTC	CEC Not Yet Filed
2011	Sandario Tap to Three Points 115 kV Line Upgrade	115 kV	SWTC	CEC Not Yet Filed

2012	Sun Valley - TS9 500 kV line	500 kV	APS, SRP, CAWCD	To be filed in 2008
2012	Palo Verde Hub - North Gila 500 kV #2 line	500 kV	APS, SRP, IID, WMIDD	CEC Approved – Decision #70127
2012	Series Capacitor Upgrade Project - Moenkopi-Eldorado 500 kV	500 kV	SCE, APS	CEC Not Required
2012	North Gila - TS8 230 kV line	230 kV	APS	To be Filed in 2008
2012	RS17 - RS24	230 kV	SRP	CEC Not Yet Filed
2012	RS24 - RS22/SEV substations	230 kV	SRP	CEC Not Yet Filed
2012	TS9 - Raceway - Avery - TS6 - Pinnacle Peak 230 kV line Project – Avery Substation	230 kV	APS	CEC Approved – Decision #69343
2012	Irvington substation - Tucson 138 kV - Tap for Kino substation	138 kV	TEP	CEC Not Yet Filed
2012	Tucson substation -Downtown substation	138 kV	TEP	CEC Not Yet Filed
2012	Marana Tap to Marana 115 kV Line Upgrade	115 kV	SWTC	CEC Not Required
2013	SunZia Project	500 kV	SWPG, SRP, TEP, ECP, Shell	CEC Not Yet Filed
2013	Jojoba loop-in of TS4-Panda 230 kV line	230 kV	APS	CEC Approved – Decision #62960
2013	CS1 to Bicknell 230 kV line	230 kV	SWTC	CEC Not Yet Filed
2013	TS9 - Raceway - Avery - TS6 - Pinnacle Peak 230 kV line Project – TS6 Substation	230 kV	APS	CEC Approved – Decision #69343
2013	Extend 138 kV line from Midvale through future Spencer to future San Joaquin	138 kV	TEP	CEC Not Yet Filed
2013	South to Duval CLEAR-Phase 2b - Extend 138 kV line from Canoa Ranch to future Duval	138 kV	TEP	CEC Approved - Case #84
2013	Loop existing Irvington station to Vail substation #2 line	138 kV	TEP	CEC Not Yet Filed
2013	Tortolita/Marana - North Loop Project -Phase 1 - Tortolita - Marana/Marana North Loop	138 kV	TEP	CEC Not Yet Filed
2013	Irvington - South Project - Phase 1 - Irvington - Corona - South line	138 kV	TEP	CEC Not Yet Filed
2013	La Canada - Orange Grove - Rillito substations 138 kV	138 kV	TEP	CEC Not Yet Filed
2013	South substation - Hartt substation - Green valley substation 138 kV	138 kV	TEP	CEC Not Yet Filed
2013	Upgrade existing 115 kV transmission line to Nogales	138 kV	UNISOURCE	CEC Not Yet Filed
2013	CS1 to Three Points 115 kV line	115 kV	SWTC	CEC Not Yet Filed
2014	Tortolita substation to Vail substation - Phase 1	345 kV	TEP	CEC Not Yet Filed

2014	RS26 - Fountain Hill substation	115 kV, 230 kV or 345 kV	SRP	CEC Not Yet Filed
2016	Irvington - South Project - Phase 2 - Corona - SS N026 - South lines	138 kV	TEP	CEC Not Yet Filed
2016	Hartt substation -SS N029 substation 138 kV	138 kV	TEP	CEC Not Yet Filed
2017	Orange Grove substation -SS N06 substation	138 kV	TEP	CEC Not Yet Filed
2018	Irvington - South Project -Phase 3 - Corona - Swan Southlands and Swan Southlands - SS NO 26 lines	138 kV	TEP	CEC Not Yet Filed
2019	Midvale substation - SS N022 substation - South substation 138 kV	138 kV	TEP	CEC Not Yet Filed
2020	Vail - SS NO27 - Cienega - SS No22- Spanish Trail Project - Phase 2 - Vail - SSN027 line	138 kV	TEP	CEC Not Yet Filed
2020	Vail substation - SS N017 - Irvington substation 138 kV	138 kV	TEP	CEC Not Yet Filed
2023	Vail - SS NO27 - Cienega - SS No22- Spanish Trail Project - Phase 3 - Cienega - SSN020 line	138 kV	TEP	CEC Not Yet Filed
2023	Tortolita/Marana - North Loop Project -Phase 2 - Marana - SSN01/SSN01 -North Loop	138 kV	TEP	CEC Not Yet Filed
2026	DeMoss Petrie substation - SS N014 substation - Northeast substation 138 kV	138 kV	TEP	CEC Not Yet Filed
2030	North Loop substation - SS N04 substation - DeMoss Petrie substation	138 kV	TEP	CEC Not Yet Filed
TBD	Palo Verde - Saguaro 500 kV line	500 kV	CATS Sub-regional Planning Group	CEC Approved – Decision#46802
TBD	Arlington Power Plant	500 kV	Dynegy Arlington Valley	CEC Approved – Decision #64357
TBD	Hassayampa - Pinal West #2	500 kV	SRP, TEP, SWTC,ED2,ED3, ED4	CEC Approved – Case #124
TBD	Tortolita substation to Winchester substation	500 kV	TEP	CEC Approved - Case #23
TBD	Gateway 345/115 kV or 345/138 kV substations	345 kV,138 kV, 115 kV	UNISOURCE	CEC Approved - Case #111
TBD	Greenlee switching station through Hidalgo to Luna	345 kV	ELPE,PNM, TXNMPC	CEC Approved – Case #21
TBD	Tortolita substation to Vail substation - Phase 2	345 kV	TEP	CEC Not Yet Filed
TBD	Tortolita substation to Vail substation - Phase 3	345 kV	TEP	CEC Not Yet Filed
TBD	Winchester substation to Vail substation - 2nd circuit	345 kV	TEP	CEC Not Yet Filed
TBD	Vail substation to South substation - 2nd circuit	345 kV	TEP	CEC Not Required

TBD	Springerville substation to Greenlee substation - 2nd circuit	345 kV	TEP	CEC Not Yet Filed
TBD	Tortolita substation to South substation	345 kV	TEP	CEC Approved - Case #50
TBD	Westwing substation to South substation - 2nd circuit	345 kV	TEP	CEC Approved - Case #15
TBD	Interconnection line-South substation to future Gateway sub	345 kV	TEP, UNISOURCE	CEC Approved - Case #111
TBD	Future Gateway substation to Comision Federale de Electricidad	345 kV	TEP	CEC Approved - Case #111
TBD	Sun Valley - TS11 - Buckeye 230 kV line	230 kV	APS	CEC Not Yet Filed
TBD	Sun Valley - TS10 - TS11 230 kV line	230 kV	APS	CEC Not Yet Filed
TBD	Sun Valley - TS9 230 kV line	230 kV	APS	To be filed in 2008
TBD	North Gila - Yucca 230 kV line	230 kV	APS	CEC Not Yet Filed
TBD	Yucca - TS8 230 kV line	230 kV	APS	CEC Not Yet Filed
TBD	Westwing -El Sol 230 kV line	230 kV	APS	CEC Approved – Docket#U-1345
TBD	Westwing - Raceway 230 kV line	230 kV	APS	CEC Approved – Decision#64473
TBD	RS17 Loop-in	230 kV	SRP	CEC Approved - Decisions #59791 and #60099
TBD	Dinosaur - RS21	230 kV	SRP	CEC Not Yet Filed
TBD	Rogers - Browning	230 kV	SRP	CEC Not Yet Filed
TBD	Silver King - Browning	230 kV	SRP	CEC Approved - Case #20
TBD	Silver King - Browning 230 kV/Superior Tie	230 kV	SRP	CEC Not Yet Filed
TBD	Westwing -Pinnacle Peak	230 kV	APS, SRP	CEC Approved – Decision #64473
TBD	Sun Valley -TS1 - 230 kV line #2	230 kV	APS	CEC Approved – Decision #67828
TBD	Palm Valley - TS2 - TS1 - 230 kV line #2	230 kV	APS	CEC Approved - Decisions #66646 and #67828
TBD	Pinnacle Peak -Brandow	230 kV	SRP	CEC Approved - Case #69
TBD	Rogers - Corbell	230 kV	SRP	CEC Not Required
TBD	Silver King - Knoll - Future Hayden	230 kV	SRP	CEC Not Yet Filed

TBD	Santa Rosa substation - ED5 substation	230 kV	SCWPDA, SPPR	CEC Not Yet Filed
TBD	ED5 - Marana	230 kV	SCWPDA, SPPR	CEC Not Yet Filed
TBD	Pinal Central (Pinal South) to a Future substation 6 miles northeast of Pinal Central #1	230 kV	SCWPDA, SPPR	CEC Not Yet Filed
TBD	Pinal Central (Pinal South) to a Future substation 6 miles northeast of Pinal Central #2	230 kV	SCWPDA, SPPR	CEC Not Yet Filed
TBD	Upgrade of Apache to Butterfield 230 kV line	230 kV	SWTC	CEC Not Yet Filed
TBD	Future Sloan substation to Huachuca 230 kV line substation	230 kV	SWTC	CEC Not Yet Filed
TBD	ED5 - Pinal South (Pinal Central)	230 kV	SCWPDA, SPPR	CEC Not Yet Filed
TBD	Valencia 115 kV substation expansion	138 kV, 115 kV	UNISOURCE	CEC Approved - Case #111
TBD	Irvington substation to East Loop substation - Phase 3	138 kV	TEP	CEC Approved - Case #66
TBD	Vail - East Loop - Phase 3 - Third 138 kV line from Vail to East Loop	138 kV	TEP	CEC Approved - Case #8
TBD	Vail - East Loop - Phase 4 - Harrison Tap of Roberts-East Loop Line	138 kV	TEP	CEC Approved - Case #8
TBD	East Loop substation to Northeast substation	138 kV	TEP	CEC Approved - Case #47
TBD	Tortolita substation -Rillito substation	138 kV	TEP	CEC Not Yet Filed
TBD	New Cienega substation- Mountain View substation	138 kV	TEP	CEC Not Yet Filed
TBD	Gateway - Sonoita 138 kV transmission line	138 kV	UNISOURCE	CEC Not Yet Filed
TBD	Nogales transmission line #2	115 kV, 138 kV	UNISOURCE	CEC Approved - Case #111
TBD	Point on the Kearny - Hayden 115 kV line to Future Hayden	115 kV	SRP	CEC Not Yet Filed

Exhibit 21 – Listing of Projects by Voltage Class

Voltage	Description	In-Service Date	Participants	Permitting/Status
500 kV	Hassayampa - Pinal West #1	2008	SRP, TEP, SWTC,ED2,ED3, ED4	CEC Approved – Case #124
500 kV	Pinal West-Southeast Valley/Browning	2011	SRP, TEP, SWTC,ED2,ED3, ED4	CEC Approved - Case #126
500 kV	Devers - Palo Verde #2	2011	SCE	CEC Denied - Case #130
500 kV	Pinal Central-Tortolita Substation	2011	TEP, SWTC	CEC Not Yet Filed
500 kV	Sun Valley - TS9 500 kV line	2012	APS, SRP, CAWCD	To be filed in 2008
500 kV	Palo Verde Hub - North Gila 500 kV #2 line	2012	APS, SRP, IID, WMIDD	CEC Approved – Decision #70127
500 kV	Series Capacitor Upgrade Project - Moenkopi-Eldorado 500 kV	2012	SCE, APS	CEC Not Required
500 kV	SunZia Project	2013	SWPG, SRP, TEP, ECP, Shell	CEC Not Yet Filed
500 kV	Palo Verde - Saguaro 500 kV line	TBD	CATS Sub-regional Planning Group	CEC Approved – Decision#46802
500 kV	Arlington Power Plant	TBD	Dynegy Arlington Valley	CEC Approved – Decision #64357
500 kV	Hassayampa - Pinal West #2	TBD	SRP, TEP, SWTC,ED2,ED3, ED4	CEC Approved – Case #124
500 kV	Tortolita substation to Winchester substation	TBD	TEP	CEC Approved - Case #23
500 kV	Sugarloaf loop-in of Coronado-Cholla 500 kV line	2009	APS, SRP	Not Required
500 kV	VV01 loop-in of Navajo-Westwing 500 kV line	2009	APS	Not Required
500 kV	Palo Verde Hub-Sun Valley 500 kV line	2010	APS, SRP, CAWCD	CEC Approved – Decision #68063
500 kV	TS9-Pinnacle Peak 500 KV line	2010	APS, SRP	CEC Approved – Decision #69343
500 kV	Hassayampa – Jojoba 500 kV line	TBD	GBPP	CEC Approved – Case#119 – Extension Request Pending

500 kV	Gila Bend Power Plant – Tap Gila River – Jojoba line	TBD	GBPP	CEC Approved – Case#109 – Extension Expires 4/2011
345 kV,138 kV, 115 kV	Gateway 345/115 kV or 345/138 kV substations	TBD	UNISOURCE	CEC Approved - Case #111
345 kV, 69 kV	White Hills substation	2010	UNISOURCE	CEC Not Required
345 kV	Bowie Power Project	2010	BOWIE	CEC Approved – Decisions #64626 and 69339
345 kV	Mazatzal loop-in of Cholla-Pinnacle Peak 345 kV line	2011	APS	Not Required
345 kV	Tortolita substation to Vail substation - Phase 1	2014	TEP	CEC Not Yet Filed
345 kV	Greenlee switching station through Hidalgo to Luna	TBD	ELPE,PNM, TXNMPC	CEC Approved – Case #21
345 kV	Tortolita substation to Vail substation - Phase 2	TBD	TEP	CEC Not Yet Filed
345 kV	Tortolita substation to Vail substation - Phase 3	TBD	TEP	CEC Not Yet Filed
345 kV	Winchester substation to Vail substation - 2nd circuit	TBD	TEP	CEC Not Yet Filed
345 kV	Vail substation to South substation - 2nd circuit	TBD	TEP	CEC Not Required
345 kV	Springerville substation to Greenlee substation - 2nd circuit	TBD	TEP	CEC Not Yet Filed
345 kV	Tortolita substation to South substation	TBD	TEP	CEC Approved - Case #50
345 kV	Westwing substation to South substation - 2nd circuit	TBD	TEP	CEC Approved - Case #15
345 kV	Interconnection line-South substation to future Gateway sub	TBD	TEP, UNISOURCE	CEC Approved - Case #111
345 kV	Future Gateway substation to Comision Federale de Electricidad	TBD	TEP	CEC Approved - Case #111
345 kV	345/69 kV Interconnection at Western's Flagstaff 345 kV bus	2010	APS	Not Required
230 kV, 69 kV	Griffith - North Havasu Transmission	2008	UNISOURCE	CEC Approved/Extended - Case #88
230 kV	Golden Valley 230 kV Project - McConico-Mercator Mill substations	2008	UNISOURCE	CEC Not Yet Filed
230 kV	TS9 - Raceway - Avery - TS6 - Pinnacle Peak 230 kV line	2010	APS	CEC Approved – Decision #69343

230 kV	SE10 loop-in of Saguaro-Casa Grande 230 kV line	2011	APS	Not Required
230 kV	Sundance - Pinal South 230 kV line	2011	APS, ED2	CEC Filed – Case #136
230 kV	Pinal South- Southeast Valley/RS22	2011	SRP, TEP, SWTC,ED2,ED3, ED4	CEC Approved - Decisions #68093 and #69291
230 kV	North Gila - TS8 230 kV line	2012	APS	To be Filed in 2008
230 kV	RS17 - RS24	2012	SRP	CEC Not Yet Filed
230 kV	RS24 - RS22/SEV substations	2012	SRP	CEC Not Yet Filed
230 kV	TS9 - Raceway - Avery - TS6 - Pinnacle Peak 230 kV line Project – Avery Substation	2012	APS	CEC Approved – Decision #69343
230 kV	Jojoba loop-in of TS4-Panda 230 kV line	2013	APS	CEC Approved – Decision #62960
230 kV	CS1 to Bicknell 230 kV line	2013	SWTC	CEC Not Yet Filed
230 kV	TS9 - Raceway - Avery - TS6 - Pinnacle Peak 230 kV line Project – TS6 substation	2013	APS	CEC Approved – Decision #69343
230 kV	Sun Valley - TS11 - Buckeye 230 kV line	TBD	APS	CEC Not Yet Filed
230 kV	Sun Valley - TS10 - TS11 230 kV line	TBD	APS	CEC Not Yet Filed
230 kV	Sun Valley - TS9 230 kV line	TBD	APS	To be filed in 2008
230 kV	North Gila - Yucca 230 kV line	TBD	APS	CEC Not Yet Filed
230 kV	Yucca - TS8 230 kV line	TBD	APS	CEC Not Yet Filed
230 kV	Westwing -El Sol 230 kV line	TBD	APS	CEC Approved – Docket#U-1345
230 kV	Westwing - Raceway 230 kV line	TBD	APS	CEC Approved – Decision#64473
230 kV	RS17 Loop-in	TBD	SRP	CEC Approved - Decisions #59791 and #60099
230 kV	Dinosaur - RS21	TBD	SRP	CEC Not Yet Filed
230 kV	Rogers - Browning	TBD	SRP	CEC Not Yet Filed
230 kV	Silver King - Browning	TBD	SRP	CEC Approved - Case #20
230 kV	Silver King - Browning 230 kV/Superior Tie	TBD	SRP	CEC Not Yet Filed
230 kV	Westwing -Pinnacle Peak	TBD	APS, SRP	CEC Approved – Decision #64473
230 kV	Pinnacle Peak -Brandow	TBD	SRP	CEC Approved - Case #69
230 kV	Rogers - Corbell	TBD	SRP	CEC Not Required

230 kV	Silver King - Knoll - Future Hayden	TBD	SRP	CEC Not Yet Filed
230 kV	Santa Rosa substation - ED5 substation	TBD	SCWPDA, SPPR	CEC Not Yet Filed
230 kV	ED5 - Marana	TBD	SCWPDA, SPPR	CEC Not Yet Filed
230 kV	Pinal Central (Pinal South) to a Future substation 6 miles northeast of Pinal Central #1	TBD	SCWPDA, SPPR	CEC Not Yet Filed
230 kV	Pinal Central (Pinal South) to a Future substation 6 miles northeast of Pinal Central #2	TBD	SCWPDA, SPPR	CEC Not Yet Filed
230 kV	Upgrade of Apache to Butterfield 230 kV line	TBD	SWTC	CEC Not Yet Filed
230 kV	Future Sloan substation to Huachuca 230 kV line substation	TBD	SWTC	CEC Not Yet Filed
230 kV	Milligan loop-in of Saguaro-Casa Grande 230 kV line	2009	APS	CEC Not Required
230 kV	Sun Valley -TS1 - 230 kV line	2010	APS	CEC Approved – Decision #67828
230 kV	Palm Valley - TS2 - TS1 - 230 kV line	2010	APS	CEC Approved - Decisions #66646 and #67828
230 kV	Sun Valley -TS1 - 230 kV line #2	TBD	APS	CEC Approved – Decision #67828
230 kV	Palm Valley - TS2 - TS1 - 230 kV line #2	TBD	APS	CEC Approved - Decisions #66646 and #67828
230 kV	Desert Basin - Pinal South 230 kV	2011	APS, SRP	CEC Approved – Decisions #68093, #68291, #69183 and #69647
230 kV	ED5 - Pinal South (Pinal Central)	TBD	SCWPDA, SPPR	CEC Not Yet Filed
138 kV, 115 kV	Valencia 115 kV substation expansion	TBD	UNISOURCE	CEC Approved - Case #111
138 kV	Loop existing West Ina substation to Tucson substation	2008	TEP	CEC Approved - Case #62
138 kV	Northeast 138 kV Static Var Compensator (SVC)	2008	TEP	CEC Not Required
138 kV	Tortolita - North Loop - Rancho Vistoso Project - Tortolita to North Loop Phase 1	2008	TEP	CEC Not Yet Filed
138 kV	Tortolita - North Loop - Rancho Vistoso Project - North Loop to Rancho Vistoso Phase 2	2009	TEP	CEC Not Yet Filed
138 kV	Rancho Vistoso substation to future Catalina substation	2010	TEP	CEC Not Required

138 kV	Vail - SS NO27 - Cienega - SS No22- Spanish Trail Project - Phase 1 - Vail - Cienega line	2010	TEP	CEC Not Yet Filed
138 kV	North Loop substation - Rancho Vistoso substation 138 kV tap for new Naranja substation	2010	TEP	CEC Not Yet Filed
138 kV	DeMoss Petrie substation - Tucson substation 138 kV	2010	TEP	CEC Not Yet Filed
138 kV	Tortolita - North Loop - Rancho Vistoso Project - Corridor Expansion Phase 3	2010	TEP	CEC Not Yet Filed
138 kV	Northeast - Snyder 138 kV - Tap for Craycroft-Barril substations	2011	TEP	CEC Not Required
138 kV	Irvington substation - Tucson 138 kV - Tap for Kino substation	2012	TEP	CEC Not Yet Filed
138 kV	Tucson substation -Downtown substation	2012	TEP	CEC Not Yet Filed
138 kV	Extend 138 kV line from Midvale through future Spencer to future San Joaquin	2013	TEP	CEC Not Yet Filed
138 kV	South to Duval CLEAR-Phase 2b - Extend 138 kV line from Canoa Ranch to future Duval	2013	TEP	CEC Approved - Case #84
138 kV	Loop existing Irvington station to Vail substation #2 line	2013	TEP	CEC Not Yet Filed
138 kV	Tortolita/Marana - North Loop Project -Phase 1 - Tortolita - Marana/Marana North Loop	2013	TEP	CEC Not Yet Filed
138 kV	Irvington - South Project - Phase 1 - Irvington - Corona - South line	2013	TEP	CEC Not Yet Filed
138 kV	La Canada - Orange Grove - Rillito substations 138 kV	2013	TEP	CEC Not Yet Filed
138 kV	South substation - Hartt substation - Green valley substation 138 kV	2013	TEP	CEC Not Yet Filed
138 kV	Upgrade existing 115 kV transmission line to Nogales	2013	UNISOURCE	CEC Not Yet Filed
138 kV	Irvington - South Project - Phase 2 - Corona - SS N026 - South lines	2016	TEP	CEC Not Yet Filed
138 kV	Hartt substation -SS N029 substation 138 kV	2016	TEP	CEC Not Yet Filed
138 kV	Orange Grove substation -SS N06 substation	2017	TEP	CEC Not Yet Filed
138 kV	Irvington - South Project -Phase 3 - Corona - Swan Southlands and Swan Southlands - SS NO 26 lines	2018	TEP	CEC Not Yet Filed
138 kV	Midvale substation - SS N022 substation - South substation 138 kV	2019	TEP	CEC Not Yet Filed
138 kV	Vail - SS NO27 - Cienega - SS No22- Spanish Trail Project - Phase 2 - Vail - SSN027 line	2020	TEP	CEC Not Yet Filed

138 kV	Vail substation - SS N017 - Irvington substation 138 kV	2020	TEP	CEC Not Yet Filed
138 kV	Vail - SS NO27 - Cienega - SS No22- Spanish Trail Project - Phase 3 - Cienega - SSN020 line	2023	TEP	CEC Not Yet Filed
138 kV	Tortolita/Marana - North Loop Project -Phase 2 - Marana - SSN01/SSN01 -North Loop	2023	TEP	CEC Not Yet Filed
138 kV	DeMoss Petrie substation - SS N014 substation - Northeast substation 138 kV	2026	TEP	CEC Not Yet Filed
138 kV	North Loop substation - SS N04 substation - DeMoss Petrie substation	2030	TEP	CEC Not Yet Filed
138 kV	Irvington substation to East Loop substation - Phase 3	TBD	TEP	CEC Approved - Case #66
138 kV	Vail - East Loop - Phase 3 - Third 138 kV line from Vail to East Loop	TBD	TEP	CEC Approved - Case #8
138 kV	Vail - East Loop - Phase 4 - Harrison Tap of Roberts-East Loop Line	TBD	TEP	CEC Approved - Case #8
138 kV	East Loop substation to Northeast substation	TBD	TEP	CEC Approved - Case #47
138 kV	Tortolita substation -Rillito substation	TBD	TEP	CEC Not Yet Filed
138 kV	New Cienega substation- Mountain View substation	TBD	TEP	CEC Not Yet Filed
138 kV	Gateway - Sonoita 138 kV transmission line	TBD	UNISOURCE	CEC Not Yet Filed
115 kV, 230 kV or 345 kV	RS26 - Fountain Hill substation	2014	SRP	CEC Not Yet Filed
115 kV, 138 kV	Nogales transmission line #2	TBD	UNISOURCE	CEC Approved - Case #111
115 kV	Apache/Hayden to San Manuel 115 kV line	2008	SWTC	CEC Not Yet Filed
115 kV	Western 115 kV line loop-in to Pantano	2009	SWTC	CEC Not Required
115 kV	Saguaro to Naviska 115 kV line	2009	SWTC	CEC Not Yet Filed
115 kV	Valencia to CAP Black Mountain 115 kV line	2009	SWTC	CEC Not Yet Filed
115 kV	CAP 115 kV line loop-in to SWTC Sandario	2009	SWTC	CEC Not Required
115 kV	Marana to Avra Valley 115 kV Line Upgrade	2010	SWTC	CEC Not Yet Filed
115 kV	Naviska to Thornydale 115 kV line	2010	SWTC	CEC Not Yet Filed
115 kV	Thornydale to Rattlesnake 115 kV line	2010	SWTC	CEC Not Yet Filed
115 kV	Avra Valley to Sandario Tap 115 kV Line Upgrade	2011	SWTC	CEC Not Yet Filed
115 kV	Sandario Tap to Three Points 115 kV Line Upgrade	2011	SWTC	CEC Not Yet Filed
115 kV	Marana Tap to Marana 115 kV Line Upgrade	2012	SWTC	CEC Not Required
115 kV	CS1 to Three Points 115 kV line	2013	SWTC	CEC Not Yet Filed

115 kV	Point on the Kearny - Hayden 115 kV line to Future Hayden	TBD	SRP	CEC Not Yet Filed

Exhibit 22 – Arizona Public Service Project Summary

Voltage	Description	In-Service Date	Participants	Mileage	Permitting/Siting Status
500 kV	VV01 loop-in of Navajo-Westwing 500 kV line	2009	APS	0.95	Not Required
500 kV	Sugarloaf loop-in of Coronado-Cholla 500 kV line	2009	APS, SRP	0.95	Not Required
500 kV	TS9-Pinnacle Peak 500 KV line	2010	APS, SRP	26.00	CEC Approved – Decision #69343
500 kV	Palo Verde Hub-Sun Valley 500 kV line	2010	APS, SRP, CAWCD	45.00	CEC Approved – Decision #68063
500 kV	Sun Valley - TS9 500 kV line	2012	APS, SRP, CAWCD	TBD	CEC To be filed in 2008
500 kV	Palo Verde Hub - North Gila 500 kV #2 line	2012	APS, SRP, IID, WMIDD	110.00	CEC Approved – Decision #70127
500 kV	Series Capacitor Upgrade Project - Moenkopi-Eldorado 500 kV	2012	APS, SCE	0.00	CEC Not Required
500 kV	Palo Verde - Saguaro 500 kV line	TBD	CATS Sub-regional Planning Group	130.00	CEC Approved – Decision#46802
345 kV	345/69 kV Interconnection at Western's Flagstaff 345 kV bus	2010	APS	0.95	CEC Not Required
345 kV	Mazatzal loop-in of Cholla-Pinnacle Peak 345 kV line	2011	APS	0.95	CEC Not Required
230 kV	Milligan loop-in of Saguaro-Casa Grande 230 kV line	2009	APS	0.95	CEC Not Required
230 kV	Sun Valley -TS1 - 230 kV line	2010	APS	15.00	CEC Approved – Decision #67828
230 kV	Palm Valley - TS2 - TS1 - 230 kV line	2010	APS	12.00	CEC Approved - Decisions #66646 and #67828
230 kV	Sun Valley -TS1 - 230 kV line #2	TBD	APS	15.00	CEC Approved – Decision #67828
230 kV	Palm Valley - TS2 - TS1 - 230 kV line #2	TBD	APS	12.00	CEC Approved - Decisions #66646 and #67828
230 kV	TS9 - Raceway - Avery - TS6 - Pinnacle Peak 230 kV line	2010	APS	27.00	CEC Approved – Decision #69343
230 kV	SE10 loop-in of Saguaro-Casa Grande 230 kV line	2011	APS	0.95	CEC Not Required

230 kV	Sundance - Pinal South 230 kV line	2011	APS, ED2	6.00	CEC Filed – Case #136
230 kV	Desert Basin - Pinal South 230 kV	2011	APS, SRP	21.00	CEC Approved – Decisions #68093, #68291, #69183 and #69647
230 kV	North Gila - TS8 230 kV line	2012	APS	15.00	To be Filed in 2008
230 kV	TS9 - Raceway - Avery - TS6 - Pinnacle Peak 230 kV line Project – Avery Substation	2012	APS	0.00	CEC Approved – Decision #69343
230 kV	Jojoba loop-in of TS4-Panda 230 kV line	2013	APS	0.95	CEC Approved – Decision #62960
230 kV	TS9 - Raceway - Avery - TS6 - Pinnacle Peak 230 kV line Project – TS6 Substation	2013	APS	0.00	CEC Approved – Decision #69343
230 kV	Sun Valley - TS11 - Buckeye 230 kV line	TBD	APS	TBD	CEC Not Yet Filed
230 kV	Sun Valley - TS10 - TS11 230 kV line	TBD	APS	TBD	CEC Not Yet Filed
230 kV	Sun Valley - TS9 230 kV line	TBD	APS	TBD	CEC To be filed in 2008
230 kV	North Gila - Yucca 230 kV line	TBD	APS	TBD	CEC Not Yet Filed
230 kV	Yucca - TS8 230 kV line	TBD	APS	TBD	CEC Not Yet Filed
230 kV	Westwing -El Sol 230 kV line	TBD	APS	11.00	CEC Approved – Docket#U-1345
230 kV	Westwing - Raceway 230 kV line	TBD	APS	7.00	CEC Approved – Decision#64473
230 kV	Westwing -Pinnacle Peak	TBD	APS, SRP	22.00	CEC Approved – Decision #64473

Exhibit 23 – Dynergy Project Summary

Voltage	Description	In-Service Date	Participants	Mileage	Permitting/Siting Status
500 kV	Arlington Power Plant	TBD	Dynegy Arlington Valley	TBD	CEC Approved – Decision #64357

Exhibit 24 – El Paso Electric Project Summary

Voltage	Description	In-Service Date	Participants	Mileage	Permitting/Siting Status
345 kV	Greenlee switching station through Hidalgo to Luna	TBD	ELPE,PNM, TXNMPC	28.00	CEC Approved – Case #21

Exhibit 25 – Gila Bend Power Partners Project Summary

Voltage	Description	In-Service	Participants	Mileage	Permitting/Siting Status
500 kV	Hassayampa – Jojoba 500 kV line	TBD	GBPP	19.00	CEC Approved – Case#119 – Extension Request Pending
500 kV	Gila Bend Power Plant – Tap Gila River – Jojoba line	TBD	GBPP	6.00	CEC Approved – Case#109 – Extension Expires 4/2011

Exhibit 26 – Public Service Company of New Mexico Project Summary

Voltage	Description	In-Service Date	Participants	Mileage	Permitting/Siting Status
345 kV	Greenlee switching station through Hidalgo to Luna	TBD	ELPE,PNM, TXNMPC	28.00	CEC Approved – Case #21

Exhibit 27 – Salt River Project Summary

Voltage	Description	In-Service	Participants	Mileage	Permitting/Siting Status
500 kV	Sugarloaf loop-in of Coronado-Cholla 500 kV line	2009	APS, SRP	0.95	CEC Not Required
500 kV	TS9-Pinnacle Peak 500 KV line	2010	APS, SRP	26.00	CEC Approved – Decision #69343
230 kV	Desert Basin - Pinal South 230 kV	2011	APS, SRP	21.00	CEC Approved – Decisions #68093, #68291, #69183 and #69647
230 kV	Westwing -Pinnacle Peak	TBD	APS, SRP	22.00	CEC Approved – Decision #64473
500 kV	Palo Verde Hub-Sun Valley 500 kV line	2010	APS, SRP, CAWCD	45.00	CEC Approved – Decision #68063
500 kV	Sun Valley - TS9 500 kV line	2012	APS, SRP, CAWCD	TBD	CEC To be filed in 2008
500 kV	Palo Verde Hub - North Gila 500 kV #2 line	2012	APS, SRP, IID, WMIDD	110.00	CEC Approved – Decision #70127
500 kV	Palo Verde - Saguaro 500 kV line	TBD	CATS Sub-regional Planning Group	130.00	CEC Approved – Decision#46802
230 kV	RS17 - RS24	2012	SRP	TBD	CEC Not Yet Filed
230 kV	RS24 - RS22/SEV substations	2012	SRP	TBD	CEC Not Yet Filed
115 kV, 230 kV or 345 kV	RS26 - Fountain Hill substation	2014	SRP	TBD	CEC Not Yet Filed
230 kV	RS17 Loop-in	TBD	SRP	0.95	CEC Approved - Decisions #59791 and #60099
230 kV	Dinosaur - RS21	TBD	SRP	TBD	CEC Not Yet Filed
230 kV	Rogers - Browning	TBD	SRP	9.00	CEC Not Yet Filed
230 kV	Silver King - Browning	TBD	SRP	38.00	CEC Approved - Case #20
230 kV	Silver King - Browning 230 kV/Superior Tie	TBD	SRP	0.50	CEC Not Yet Filed
230 kV	Pinnacle Peak - Brandow	TBD	SRP	TBD	CEC Approved - Case #69
230 kV	Rogers - Corbell	TBD	SRP	12.00	CEC Not Required
230 kV	Silver King - Knoll -	TBD	SRP	35.00	CEC Not Yet Filed

	Future Hayden				
115 kV	Point on the Kearny - Hayden 115 kV line to Future Hayden	TBD	SRP	0.75	CEC Not Yet Filed
500 kV	Hassayampa - Pinal West #1	2008	SRP, TEP, SWTC,ED2,ED3, ED4	51.00	CEC Approved – Case #124
500 kV	Hassayampa - Pinal West #2	TBD	SRP, TEP, SWTC,ED2,ED3, ED4	51.00	CEC Approved – Case #124
500 kV	Pinal West-Southeast Valley/Browning	2011	SRP, TEP, SWTC,ED2,ED3, ED4	50.00	CEC Approved - Case #126
230 kV	Pinal South- Southeast Valley/RS22	2011	SRP, TEP, SWTC,ED2,ED3, ED4	30.00	CEC Approved - Decisions #68093 and #69291

Exhibit 28 – Santa Cruz Water and Power District Project Summary

Voltage	Description	In-Service Date	Participants	Mileage	Permitting/Siting Status
230 kV	Santa Rosa substation - ED5 substation	TBD	SCWPDA, SPPR	38.00	CEC Not Yet Filed
230 kV	ED5 - Pinal South (Pinal Central)	TBD	SCWPDA, SPPR	18.00	CEC Not Yet Filed
230 kV	ED5 - Marana	TBD	SCWPDA, SPPR	28.00	CEC Not Yet Filed
230 kV	Pinal Central (Pinal South) to a Future substation 6 miles northeast of Pinal Central #1	TBD	SCWPDA, SPPR	6.00	CEC Not Yet Filed
230 kV	Pinal Central (Pinal South) to a Future substation 6 miles northeast of Pinal Central #2	TBD	SCWPDA, SPPR	6.00	CEC Not Yet Filed

Exhibit 29 – Southern California Edison Project Summary

Voltage	Description	In-Service Date	Participants	Mileage	Permitting/Siting Status
500 kV	Devers - Palo Verde #2	2011	SCE	230.00	CEC Denied - Case #130
500 kV	Series Capacitor Upgrade Project - Moenkopi-Eldorado 500 kV	2012	SCE, APS	0.00	CEC Not Required

Exhibit 30 – Southwestern Power Group Project Summary

Voltage	Description	In-Service	Participants	Mileage	Permitting/Siting Status
500 kV	SunZia Project	2013	SWPG, SRP, TEP, ECP, Shell	500.00	CEC Not Yet Filed
345 kV	Bowie Power Project	2010	BOWIE	15.00	CEC Approved – Decision #64626

Exhibit 31 – Southwest Transmission Cooperative Project Summary

Voltage	Description	In-Service	Participants	Mileage	Permitting/Siting Status
500 kV	Hassayampa - Pinal West #1	2008	SRP, TEP, SWTC,ED2,ED3, ED4	51.00	CEC Approved – Case #124
500 kV	Hassayampa - Pinal West #2	TBD	SRP, TEP, SWTC,ED2,ED3, ED4	51.00	CEC Approved – Case #124
500 kV	Pinal West-Southeast Valley/Browning	2011	SRP, TEP, SWTC,ED2,ED3, ED4	50.00	CEC Approved - Case #126
500 kV	Pinal Central-Tortolita Substation	2011	SWTC, TEP	30.00	CEC Not Yet Filed
230 kV	Pinal South- Southeast Valley/RS22	2011	SRP, TEP, SWTC,ED2,ED3, ED4	30.00	CEC Approved - Decisions #68093 and #69291
115 kV	Apache/Hayden to San Manuel 115 kV line	2008	SWTC	4.50	CEC Not Yet Filed
115 kV	Western 115 kV line loop-in to Pantano	2009	SWTC	0.20	CEC Not Required
115 kV	Saguaro to Naviska 115 kV line	2009	SWTC	3.20	CEC Not Yet Filed
115 kV	Valencia to CAP Black Mountain 115 kV line	2009	SWTC	2.60	CEC Not Yet Filed
115 kV	CAP 115 kV line loop-in to SWTC Sandario	2009	SWTC	0.60	CEC Not Required
115 kV	Marana to Avra Valley 115 kV Line Upgrade	2010	SWTC	8.75	CEC Not Yet Filed
115 kV	Naviska to Thornydale 115 kV line	2010	SWTC	7.00	CEC Not Yet Filed
115 kV	Thornydale to Rattlesnake 115 kV line	2010	SWTC	19.00	CEC Not Yet Filed
115 kV	Avra Valley to Sandario Tap 115 kV Line Upgrade	2011	SWTC	2.80	CEC Not Yet Filed
115 kV	Sandario Tap to Three Points 115 kV Line Upgrade	2011	SWTC	13.71	CEC Not Yet Filed
115 kV	Marana Tap to Marana 115 kV Line Upgrade	2012	SWTC	0.20	CEC Not Required

115 kV	CS1 to Three Points 115 kV line	2013	SWTC	0.50	
230 kV	CS1 to Bicknell 230 kV line	2013	SWTC	21.00	CEC Not Yet Filed
230 kV	Upgrade of Apache to Butterfield 230 kV line	TBD	SWTC	16.00	CEC Not Yet Filed
230 kV	Future Sloan substation to Huachuca 230 kV line substation	TBD	SWTC	24.00	CEC Not Yet Filed

Exhibit 32 – Tucson Electric Power Project Summary

Voltage	Description	In-Service	Participants	Mileage	Permitting/Siting Status
500 kV	Palo Verde - Saguaro 500 kV line	TBD	CATS Sub-regional Planning Group	130.00	CEC Approved – Decision#46802
500 kV	Hassayampa - Pinal West #1	2008	SRP, TEP, SWTC,ED2,ED3, ED4	51.00	CEC Approved – Case #124
500 kV	Hassayampa - Pinal West #2	TBD	SRP, TEP, SWTC,ED2,ED3, ED4	51.00	CEC Approved – Case #124
500 kV	Pinal West-Southeast Valley/Browning	2011	SRP, TEP, SWTC,ED2,ED3, ED4	50.00	CEC Approved - Case #126
230 kV	Pinal South- Southeast Valley/RS22	2011	SRP, TEP, SWTC,ED2,ED3, ED4	30.00	CEC Approved - Decisions #68093 and #69291
500 kV	Pinal Central-Tortolita Substation	2011	TEP, SWTC	30.00	CEC Not Yet Filed
345 kV	Tortolita substation to Vail substation - Phase 1	2014	TEP	60.00	CEC Not Yet Filed
345 kV	Tortolita substation to Vail substation - Phase 2	TBD	TEP	0.00	CEC Not Yet Filed
345 kV	Tortolita substation to Vail substation - Phase 3	TBD	TEP	0.00	CEC Not Yet Filed
500 kV	Tortolita substation to Winchester substation	TBD	TEP	80.00	CEC Approved - Case #23
345 kV	Winchester substation to Vail substation – 2nd Circuit	TBD	TEP	40.00	CEC Not Yet Filed
345 kV	Vail substation to South substation - 2nd circuit	TBD	TEP	14.00	CEC Not Required
345 kV	Springerville substation to Greenlee substation - 2nd circuit	TBD	TEP	110.00	CEC Not Yet Filed
345 kV	Tortolita substation to South substation	TBD	TEP	68.00	CEC Approved - Case #50
345 kV	Westwing substation to South substation – 2nd circuit	TBD	TEP	178.00	CEC Approved - Case #15
345 kV	Future Gateway substation to Comision Federale de Electricidad	TBD	TEP	2.00	CEC Approved - Case #111
138 kV	Irvington substation to East Loop substation - Phase 3	TBD	TEP	9.00	CEC Approved - Case #66

138 kV	Vail - East Loop - Phase 3 - Third 138 kV line from Vail to East Loop	TBD	TEP	22.00	CEC Approved - Case #8
138 kV	Vail - East Loop - Phase 4 - Harrison Tap of Roberts-East Loop Line	TBD	TEP	0.00	CEC Approved - Case #8
138 kV	East Loop substation to Northeast substation	TBD	TEP	13.00	CEC Approved - Case #47
138 kV	Loop existing West Ina substation to Tucson substation	2008	TEP	0.95	CEC Approved - Case #62
138 kV	Extend 138 kV line from Midvale through future Spencer to future San Joaquin	2013	TEP	20.00	CEC Not Yet Filed
138 kV	South to Duval CLEAR-Phase 2b - Extend 138 kV line from Canoa Ranch to future Duval	2013	TEP	24.00	CEC Approved - Case #84
138 kV	Rancho Vistoso substation to future Catalina substation	2010	TEP	3.50	CEC Not Required
138 kV	Loop existing Irvington station to Vail substation #2 line	2013	TEP	5.00	CEC Not Yet Filed
138 kV	Tortolita substation -Rillito substation	TBD	TEP	24.50	CEC Not Yet Filed
138 kV	Vail - SS NO27 - Cienega - SS No22- Spanish Trail Project - Phase 1 - Vail - Cienega line	2010	TEP	12.20	CEC Not Yet Filed
138 kV	Vail - SS NO27 - Cienega - SS No22- Spanish Trail Project - Phase 2 - Vail - SSN027 line	2020	TEP	5.30	CEC Not Yet Filed
138 kV	Vail - SS NO27 - Cienega - SS No22- Spanish Trail Project - Phase 3 - Cienega - SSN020 line	2023	TEP	14.00	CEC Not Yet Filed
138 kV	New Cienega substation- Mountain View substation	TBD	TEP	4.70	CEC Not Yet Filed
138 kV	Northeast - Snyder 138 kV - Tap for Craycroft-Barril substations	2011	TEP	8.00	CEC Not Required
138 kV	Irvington substation - Tucson 138 kV - Tap for Kino substation	2012	TEP	10.90	CEC Not Yet Filed
138 kV	Tortolita/Marana - North Loop Project -Phase 1 -Tortolita - Marana/Marana North Loop	2013	TEP	22.00	CEC Not Yet Filed

138 kV	Tortolita/Marana - North Loop Project -Phase 2 - Marana - SSN01/SSN01 -North Loop	2023	TEP	13.50	CEC Not Yet Filed
138 kV	North Loop substation - Rancho Vistoso substation 138 kV tap for new Naranja substation	2010	TEP	24.50	CEC Not Yet Filed
138 kV	DeMoss Petrie substation - Tucson substation 138 kV	2010	TEP	4.50	CEC Not Yet Filed
138 kV	Northeast 138 kV Static Var Compensator (SVC)	2008	TEP	0.00	CEC Not Required
138 kV	North Loop substation - SS N04 substation - DeMoss Petrie substation	2030	TEP	15.80	CEC Not Yet Filed
138 kV	Midvale substation - SS N022 substation - South substation 138 kV	2019	TEP	13.00	CEC Not Yet Filed
138 kV	Irvington - South Project - Phase 1 - Irvington - Corona - South line	2013	TEP	16.10	CEC Not Yet Filed
138 kV	Irvington - South Project - Phase 2 - Corona - SS N026 - South lines	2016	TEP	13.10	CEC Not Yet Filed
138 kV	Irvington - South Project -Phase 3 - Corona - Swan Southlands and Swan Southlands - SS NO 26 lines	2018	TEP	16.10	CEC Not Yet Filed
138 kV	La Canada - Orange Grove - Rillito substations 138 kV	2013	TEP	5.40	CEC Not Yet Filed
138 kV	Orange Grove substation -SS N06 substation	2017	TEP	3.60	CEC Not Yet Filed
138 kV	South substation - Hartt substation - Green valley substation 138 kV	2013	TEP	14.50	CEC Not Yet Filed
138 kV	Hartt substation -SS N029 substation 138 kV	2016	TEP	7.10	CEC Not Yet Filed
138 kV	Tucson substation -Downtown substation	2012	TEP	1.00	CEC Not Yet Filed
138 kV	DeMoss Petrie substation - SS N014 substation - Northeast substation 138 kV	2026	TEP	13.50	CEC Not Yet Filed
138 kV	Vail substation - SS N017 - Irvington substation 138 kV	2020	TEP	10.00	CEC Not Yet Filed
138 kV	Tortolita - North Loop - Rancho	2008	TEP	14.30	CEC Not Yet Filed

	Vistoso Project - Tortolita to North Loop Phase 1				
138 kV	Tortolita - North Loop - Rancho Vistoso Project - Corridor Expansion Phase 3	2010	TEP	18.00	CEC Not Yet Filed
138 kV	Tortolita - North Loop - Rancho Vistoso Project - North Loop to Rancho Vistoso Phase 2	2009	TEP, SWTC	11.10	CEC Not Yet Filed
345 kV	Interconnection line-South substation to future Gateway sub	TBD	TEP, UNISOURCE	60.00	CEC Approved - Case #111

Exhibit 33 – UniSource Electric Project Summary

Voltage	Description	In-Service	Participants	Mileage	Permitting/Siting Status
345 kV	Interconnection line-South substation to future Gateway sub	TBD	TEP, UNISOURCE	60.00	CEC Approved - Case #111
230 kV	Griffith - North Havasu Transmission	2008	UNISOURCE	40.00	CEC Approved/Extended - Case #88
230 kV	Golden Valley 230 kV Project - McConico-Mercator Mill substations	2008	UNISOURCE	20.00	CEC Not Yet Filed
345 kV	White Hills substation	2010	UNISOURCE	0.00	CEC Not Required
115 kV, 138 kV	Nogales transmission line #2	TBD	UNISOURCE	3.00	CEC Approved - Case #111
138 kV	Upgrade existing 115 kV transmission line to Nogales	2013	UNISOURCE	60.00	CEC Not Yet Filed
138 kV, 115 kV	Valencia 115 kV substation expansion	TBD	UNISOURCE	0.00	CEC Approved - Case #111
345 kV,138 kV, 115 kV	Gateway 345/115 kV or 345/138 kV substations	TBD	UNISOURCE	0.00	CEC Approved - Case #111
138 kV	Gateway - Sonoita 138 kV transmission line	TBD	UNISOURCE	10.00	CEC Not Yet Filed

Exhibit 34 – Wellton-Mohawk Irrigation and Drainage District Project Summary

Voltage	Description	In-Service Date	Participants	Mileage	Permitting/Siting Status
500 kV	Palo Verde Hub - North Gila 500 kV #2 line	2012	APS, SRP, IID, WMIDD	110.00	CEC Approved – Decision #70127

Exhibit 35 – Arizona Renewable Energy Task Force Map #1

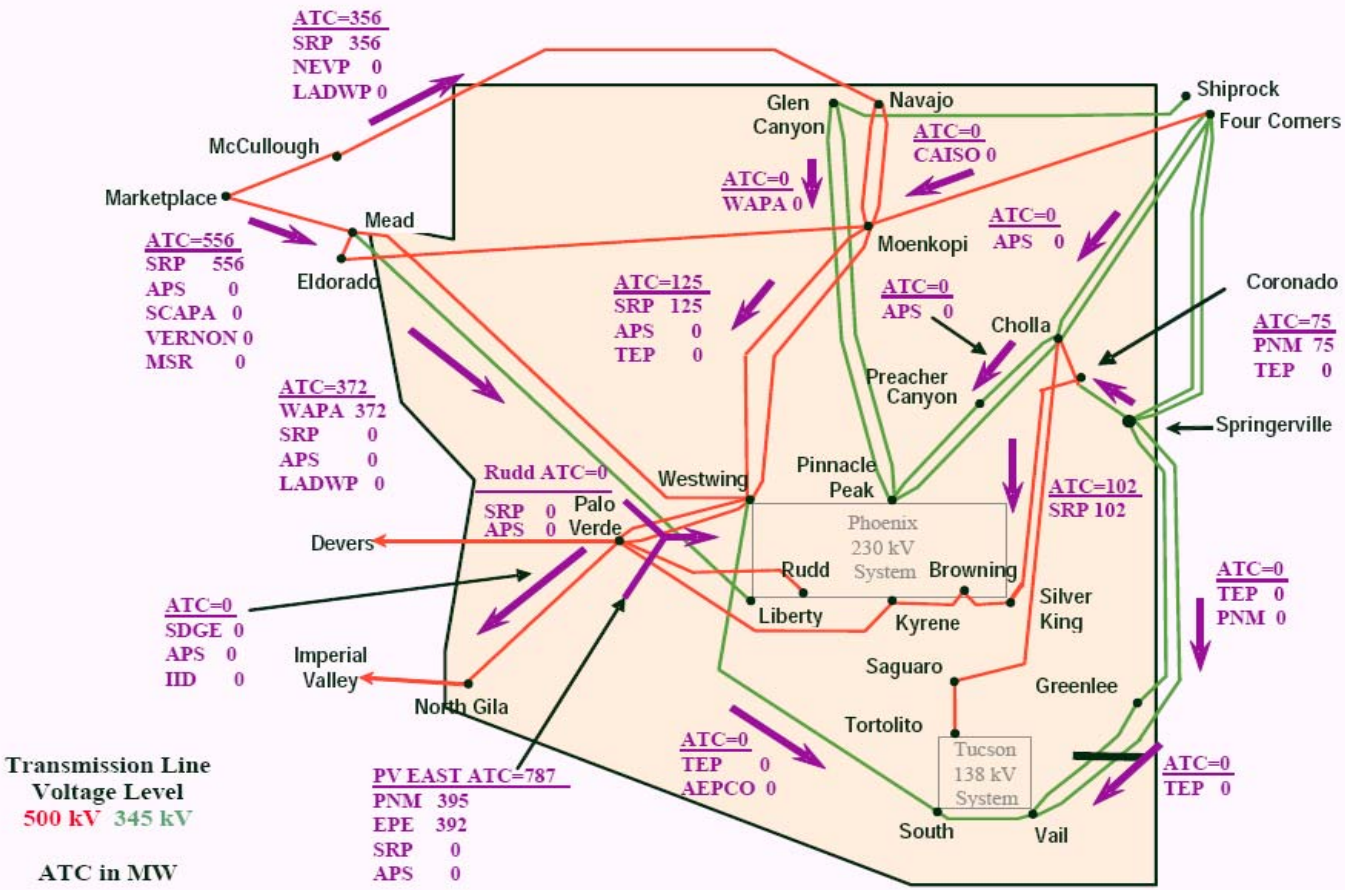


Figure 1: ATC for Arizona Paths in June 2007

Exhibit 36 – Arizona Renewable Energy Task Force Map #2

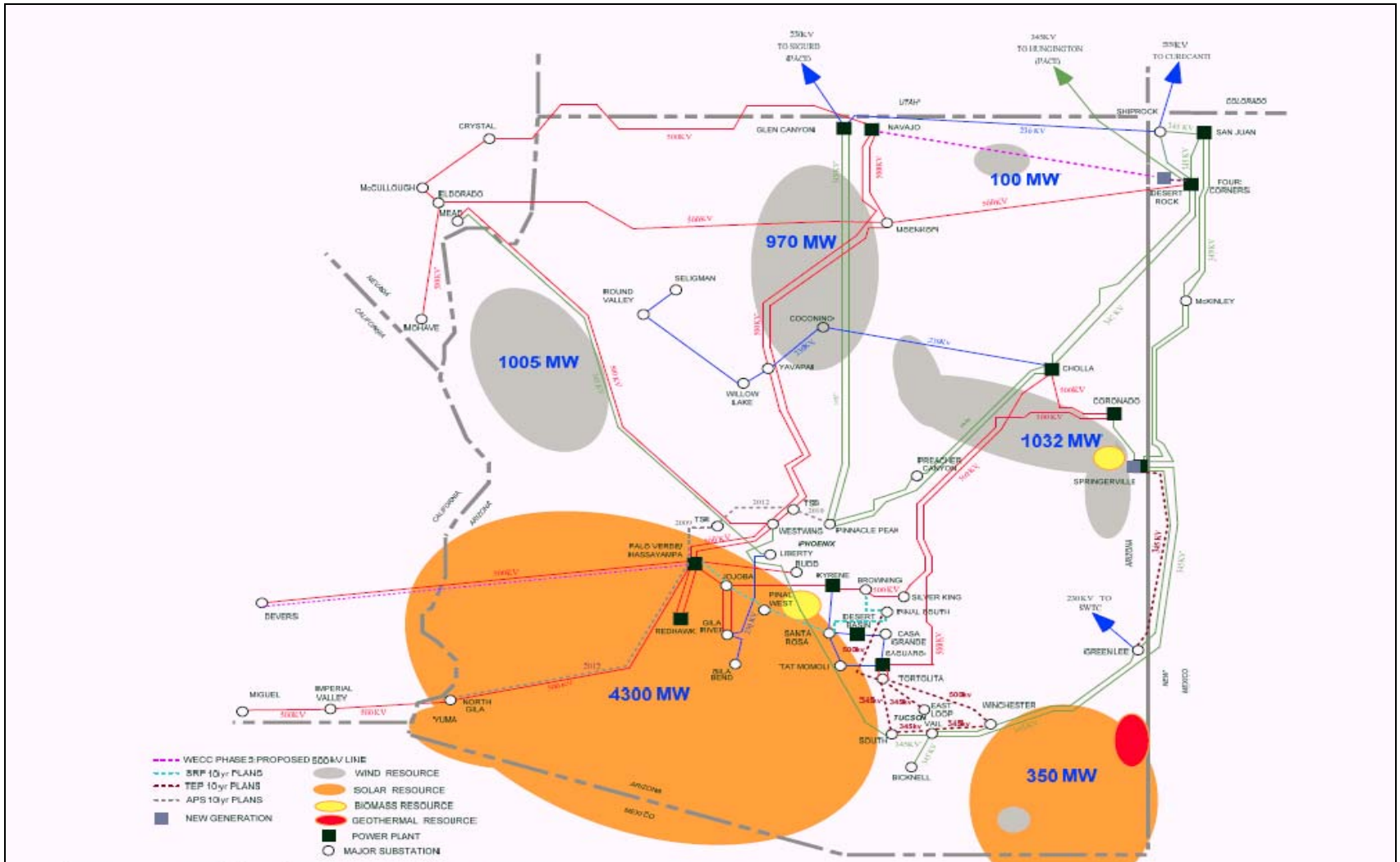


Figure 2: Potential Arizona Renewable Resources

Exhibit 37 – Arizona Renewable Energy Task Force Map #3

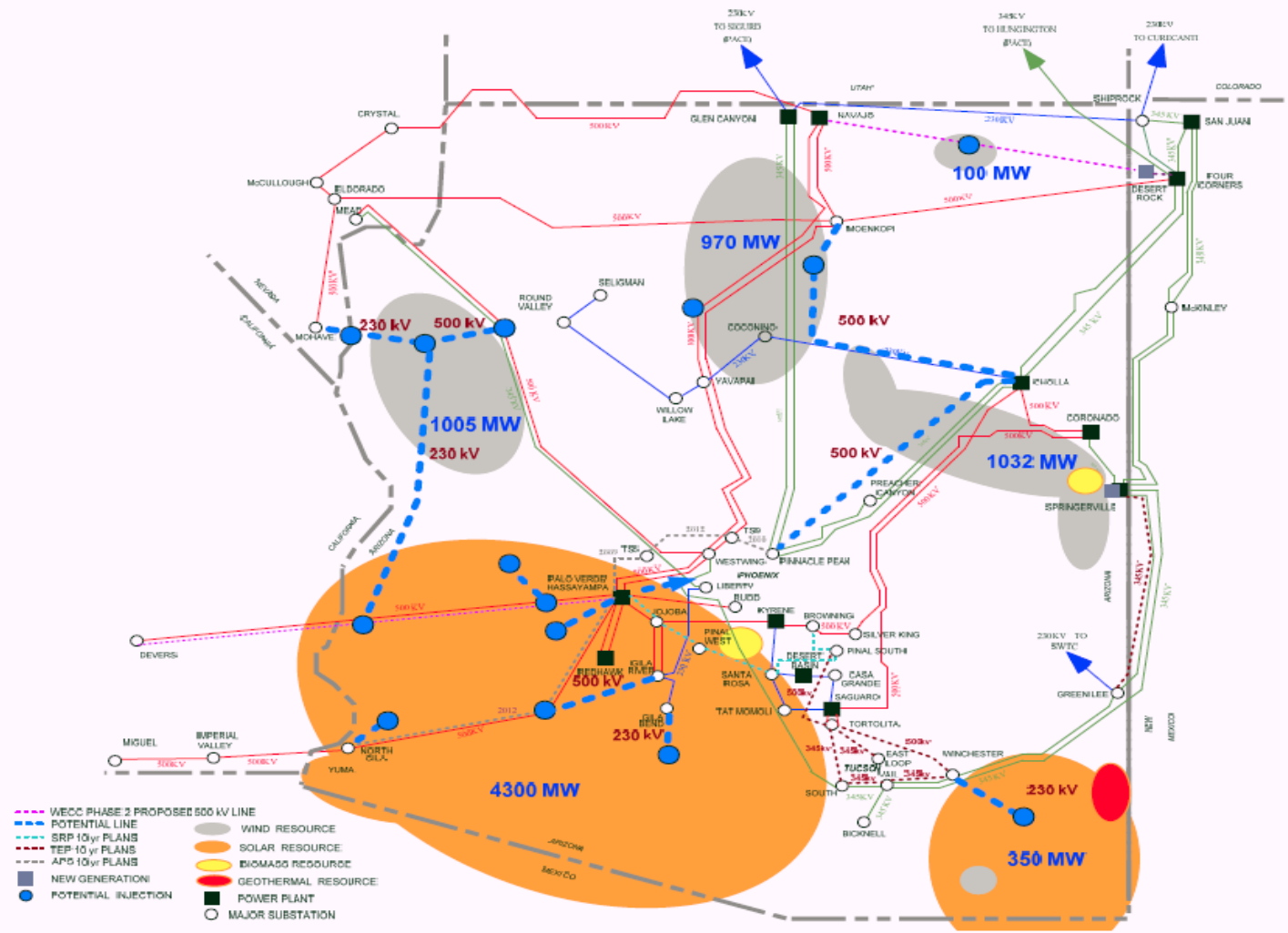
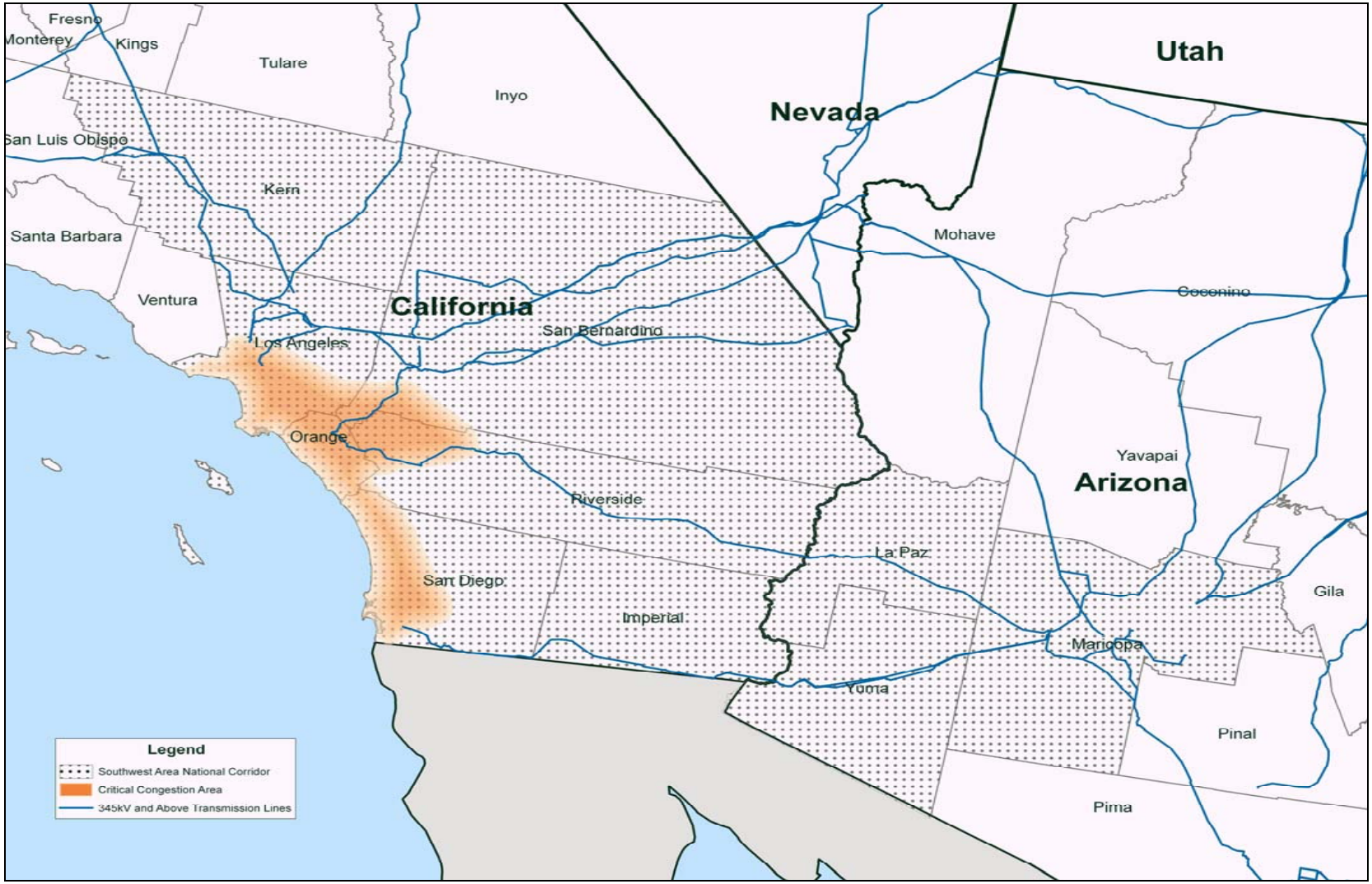


Figure 3: A Potential Configuration for Transmission to Serve All Available Renewable Resources in Arizona

Exhibit 38 – NIETC Corridor Map[2]



[2] http://nietc.anl.gov/documents/docs/NIETC_Southwest_Area_Corridor_Map.pdf