Feasibility Study For Generation Interconnection Request GEN-2006-039

SPP Tariff Studies
(#GEN-2006-039)

April, 2007

Executive Summary

<OMITTED TEXT> (Customer) has requested a Feasibility Study for the purpose of interconnecting 400 MW of wind generation within the control area of Southwestern Public Service Company (SPS) in Deaf Smith and Randall counties, Texas. The proposed point of interconnection is a new switching station on the existing Potter County – Plant X 230 kV transmission line, owned by SPS. The proposed in-service date is October 1, 2008.

Power flow analysis has indicated that for the powerflow cases studied, it is possible to interconnect the 400 MW of generation with transmission system reinforcements within the local transmission system. In order to maintain acceptable reactive power compensation, the customer will need to install 20 Mvars of 34.5 kV capacitor banks in the Customer's collector substation on the 34.5 kV bus. Dynamic Stability studies performed as part of the impact study will provide additional guidance as to whether the required reactive compensation can be static or a portion must be dynamic (such as a SVC).

The requirement to interconnect the 400 MW of generation on the existing Potter County – Plant X 230 kV transmission line consists of building a new 230 kV three-breaker ring-bus switching station. Customer did not propose a specific 230 kV line extending to serve its 230 – 34.5 kV facilities. It is assumed that obtaining all necessary right-of-way for the new switching station will not be a significant expense.

The total minimum cost for building the required facilities for this 400 MW of generation is $3,000,000. These costs are shown in Table 2. Other Network Constraints in the American Electric Power West (AEPW), SPS, and Western Farmers Electric Cooperative (WFEC) transmission systems that may be verified with a transmission service request and associated studies are listed in Table 3. These Network Constraints are in the local area of the new generation when this generation is sunk throughout the SPP footprint for the Energy Resource (ER) Interconnection request. With a defined source and sink in a Transmission Service Request (TSR), this list of Network Constraints will be refined and expanded to account for all Network Upgrade requirements. This cost does not include building the 230 kV line from the Customer substation into the new 230 kV ring bus. This cost does not include the Customer's 230/34.5 kV substation or the 34.5 kV, 20 Mvar capacitor bank(s).

In Table 4, a value of Available Transfer Capability (ATC) associated with each overloaded facility is included. These values may be used by the Customer for future analyses including the determination of lower generation capacity levels that may be installed. When transmission service associated with this interconnection is evaluated, the loading of the facilities listed in this table may be greater due to higher priority reservations. If the loading of a facility is higher, the level of ATC will be lower.

There are several other proposed generation additions in the general area of the Customer's facility. It was assumed in this preliminary analysis that not all of these other projects within the SPS control area will be in service. Those previously queued projects that have advanced to nearly complete phases were included in this Feasibility Study. In the event that another request for a generation interconnection with a higher priority withdraws, then this request may have to be re-evaluated to determine the local Network Constraints.

Introduction

<OMITTED TEXT> (Customer) has requested a feasibility study for the purpose of interconnecting 400 MW of wind generation within the control area of Southwestern Public Service Company (SPS) in Deaf Smith and Randall counties, Texas. The proposed method of interconnection is to build a new three-breaker ring-bus switching station on the existing Potter County – Plant X 230 kV transmission line, which is owned by SPS. The proposed in-service date is October 1, 2008.

Interconnection Facilities

The primary objective of this study is to identify the system problems associated with connecting the plant to the area transmission system. The Feasibility and other subsequent Interconnection Studies are designed to identify attachment facilities, Network Upgrades and other direct assignment facilities needed to accept power into the grid at the interconnection receipt point.

The requirements for interconnection of the 400 MW consist of constructing a new 230 kV three-breaker ring-bus station on the existing Potter County – Plant X 230 kV transmission line owned by SPS. This substation shall be constructed and maintained by SPS. The Customer did not propose a route of its 230 kV line to serve its 230/34.5 kV facilities. It is assumed that obtaining all necessary right-of-way for the substation construction will not be a significant expense.

The total cost for building a new 230 kV three breaker ring switching station and the required interconnection facilities, is estimated at $3,000,000. Other Network Constraints in the American Electric Power West (AEPW), SPS, and Western Farmers Electric Cooperative (WFEC) transmission systems that were identified are listed in Table 3. These estimates will be refined during the development of the impact study based on the final designs. This cost does not include building the 230 kV facilities from the Customer substation into the new 230 kV ring bus. The Customer is responsible for these 230 kV facilities up to the point of interconnection. This cost also does not include the Customer's 230/34.5 kV substation, which should be determined by the Customer.

The costs of interconnecting the facility to the SPS transmission system are listed in Tables 1 & 2. **These costs do not include any cost that might be associated with short circuit study results or dynamic stability study results**. These costs will be determined when and if a System Impact Study is conducted.

A preliminary one-line drawing of the interconnection and direct assigned facilities are shown in Figure 1.

Table 1: Direct Assignment Facilities

FACILITY	ESTIMATED COST (2007 DOLLARS)
Customer – 230/34.5 kV Substation facilities.	*
Customer – 230 kV transmission line facilities between Customer facilities and the new 230 kV ring bus.	*
Customer - Right-of-Way for Customer facilities.	
Customer – 34.5 kV, 20 Mvar capacitor bank(s) in Customer substation.	*
Total	*****

*Note: * Estimates of cost to be determined by Customer.*

Table 2: Required Interconnection Network Upgrade Facilities

FACILITY	ESTIMATED COST (2007 DOLLARS)
SPS – Build 230 kV, 3-breaker ring-bus switching station. Station to include breakers, switches, control relaying, high speed communications, metering and related equipment and all structures	**$3,000,000**
Total	*****

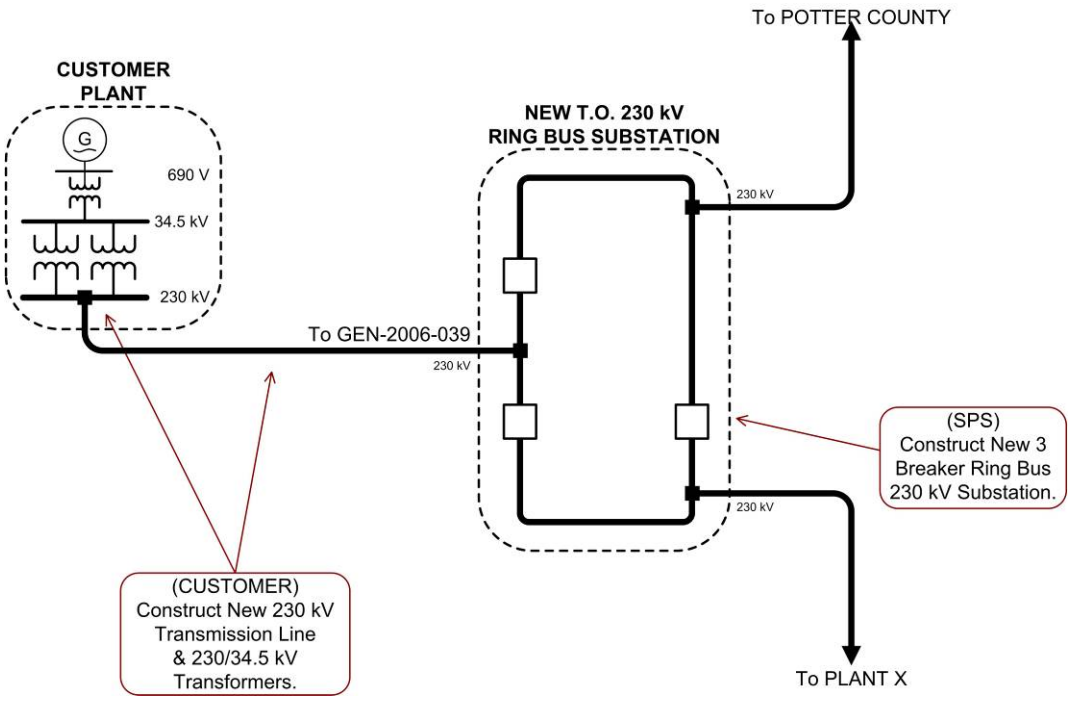

Figure 1: Proposed Interconnection
(Final substation design to be determined)

Powerflow Analysis

A powerflow analysis was conducted for the facility using modified versions of the 2008 and 2011 summer and winter peak, and 2016 summer peak models. The output of the Customer's facility was offset in each model by a reduction in output of existing online SPP generation. This method allows the request to be studied as an Energy Resource (ER) Interconnection request. The proposed in-service date of the generation is October 1, 2008. The available seasonal models used were through the 2016 Summer Peak of which is the end of the current SPP planning horizon.

The analysis of the Customer's project indicates that, given the requested generation level of 400 MW and location, additional criteria violations will occur on the existing AEPW, SPS, and WFEC transmission systems under steady state and contingency conditions in the peak seasons.

In Table 4, a value of Available Transfer Capability (ATC) associated with each overloaded facility is included. These values may be used by the Customer to determine lower generation capacity levels that may be installed. When transmission service associated with this interconnection is evaluated, the loading of the facilities listed in this table may be greater due to higher priority reservations. When a facility is overloaded for more than one contingency, only the highest loading on the facility for each season is included in the table.

In order to maintain a zero reactive power flow exchanged at the point of interconnection, additional reactive compensation is required at the point of interconnection. The Customer will be required to install 20 Mvar of capacitor banks in their substation on the 34.5 kV buses in the Customer substation. Dynamic Stability studies performed as part of the impact study will provide additional guidance as to whether the reactive compensation can be static or a portion

must be dynamic (such as a SVC or STATCOM). It is possible that an SVC or STATCOM device will be required at the Customer facility because of FERC Order 661A Low Voltage Ride Through Provisions (LVRT) which went into effect January 1, 2006. FERC Order 661A orders that wind farms stay on line for 3 phase faults at the point of interconnection even if that requires the installation of a SVC or STATCOM device.

There are several other proposed generation additions in the general area of the Customer's facility. Some of the local projects that were previously queued were assumed to be in service in this Feasibility Study. Those local projects that were previously queued and have advanced to nearly complete phases were included in this Feasibility Study.

Powerflow Analysis Methodology

The Southwest Power Pool (SPP) criteria states that: "The transmission system of the SPP region shall be planned and constructed so that the contingencies as set forth in the Criteria will meet the applicable *NERC Planning Standards* for System Adequacy and Security – Transmission System Table l hereafter referred to as NERC Table l) and its applicable standards and measurements".

Using the created models and the ACCC function of PSS\E, single contingencies in portions or all of the modeled control areas of Sunflower Electric Power Corporation (SUNC), Missouri Public Service (MIPU), Westar (WESTAR), Kansas City Power & Light (KCPL), West Plains (WEPL), Midwest Energy (MIDW), Oklahoma Gas and Electric OKGE, American Electric Power West (AEPW), Grand River Dam Authority (GRDA), Southwestern Public Service Company (SPS), Western Farmers Electric Cooperative (WFEC) and other control areas were applied and the resulting scenarios analyzed. This satisfies the 'more probable' contingency testing criteria mandated by NERC and the SPP criteria.

Table 3: Network Constraints

AREA	ELEMENT
AEPW	CLINTON - ELK CITY 138KV CKT 1
AEPW	ELK CITY (ELKCTY-4) 138/69/13.8KV TRANSFORMER CKT 1
AEPW	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
AEPW	JERICHO (JERIC2WT) 115/69/14.4KV TRANSFORMER CKT 1
AEPW	SHAMROCK (SHAMRCK1) 138/69/KV TRANSFORMER CKT 1
AEPW	SHAMROCK (SHAMRCK2) 115/69/KV TRANSFORMER CKT 1
AEPW-SPS	ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1
AEPW-SPS	MCLELLAN RURAL - SHAMROCK 115KV CKT 1
AEPW-WFEC	ELK CITY (AEPW-WFEC TIE) 69KV CKT 1
AEPW-WFEC	LAKE PAULINE - ELDORADO 69KV CKT 1
AEPW-WFEC	LAKE PAULINE - RUSSELL 138KV CKT 1
AEPW-WFEC	RUSSELL - ALTUS TAP 138KV CKT 1
SPS	CONWAY - KIRBY 115KV CKT 1
SPS	CONWAY - KIRBY 115KV CKT 1
SPS	HAPPY INTERCHANGE - PALO DURO 115KV CKT 1
SPS	KIRBY - MCLELLAN 115KV CKT 1
SPS	MCLELLAN RURAL - MCLELLAN 115KV CKT 1
SPS	PALO DURO - RANDALL COUNTY INTERCHANGE 115KV CKT 1
SPS	POTTER COUNTY (POTTR CO) 345/230/13.2KV TRANSFORMER CKT 1
SPS-MULTIPLE	SPS-SPP TIES: TUCO INTERCHANGE - O.K.U. 345KV CKT 1 ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1 MCLELLAN RURAL - SHAMROCK 115KV CKT 1 FINNEY - HOLCOMB 345KV CKT 1 TEXAS COUNTY INTERCHANGE PHASE SHIFTER TRANSFORMER CKT 1 JERICHO 115/69/14.4KV TRANSFORMER CKT 1
SPS	TUCO (TUCO XX4) 345/230/13.2KV TRANSFORMER CKT 1
WFEC	GYPSUM - RUSSELL 69KV CKT 1
AEPW	AMERICAN ELECTRIC POWER WEST
SPS	SOUTHWESTERN PUBLIC SERVICE COMPANY
WFEC	WESTERN FARMERS ELECTRIC COOPERATIVE
MULTIPLE	AEPW & SUNFLOWER ELECTRIC POWER CORPORATION (SUNC)

Table 4: Contingency Analysis

ELEMENT	SEASON	RATE (MVA)	LOADING (%)	ATC (MW)	CONTINGENCY
2008 Winter Peak Model					
SPS-SPP TIES: TUCO INTERCHANGE - O.K.U. 345KV CKT 1, ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1, MCLELLAN RURAL - SHAMROCK 115KV CKT 1, FINNEY - HOLCOMB 345KV CKT 1, TEXAS COUNTY INTERCHANGE PHASE SHIFTER TRANSFORMER CKT 1, JERICHO 115/69/14.4KV TRANSFORMER CKT 1	08WP	620	192	0	BASE CASE
SHAMROCK (SHAMRCK1) 138/69/KV TRANSFORMER CKT 1	08WP	69	187	0	SPP-SWPS-03: ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1 and GRAPEVINE INTYERCHANGE - NICHOLS STATION 230KV CKT 1
ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	08WP	287	183	0	FINNEY STATION - HOLCOMB 345KV CKT 1
SHAMROCK (SHAMRCK2) 115/69/KV TRANSFORMER CKT 1	08WP	69	176	0	SPP-SWPS-03: ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1 and GRAPEVINE INTYERCHANGE - NICHOLS STATION 230KV CKT 1
GYPSUM - RUSSELL 69KV CKT 1	08WP	26	152	0	LAKE PAULINE - RUSSELL 138KV CKT 1
JERICHO (JERIC2WT) 115/69/14.4KV TRANSFORMER CKT 1	08WP	46	146	0	SPP-SWPS-03: ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1 and GRAPEVINE INTYERCHANGE - NICHOLS STATION 230KV CKT 1
ELK CITY (AEPW-WFEC TIE) 69KV CKT 1	08WP	39	140	0	FINNEY STATION - HOLCOMB 345KV CKT 1
CONWAY - KIRBY 115KV CKT 1	08WP	218	113	0	NICHOLS STATION - YARNELL3 115KV CKT 1
NO SOLUTION REACHED	08WP			0	OKLAUNION - TUCO INTERCHANGE 345KV CKT 1
NO SOLUTION REACHED	08WP			0	SPP-SWPS-04a: LAMAR - FINNEY STATION 345KV CKT 1 and FINNEY STATION - POTTER COUNTY 345KV CKT 1
ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1	08WP	351	149	41	FINNEY STATION - HOLCOMB 345KV CKT 1
LAKE PAULINE - RUSSELL 138KV CKT 1	08WP	72	147	55	SPP-SWPS-03: ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1 and GRAPEVINE INTYERCHANGE - NICHOLS STATION 230KV CKT 1
LAKE PAULINE - ELDORADO 69KV CKT 1	08WP	20	127	84	SPP-SWPS-03: ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1 and GRAPEVINE INTYERCHANGE - NICHOLS STATION 230KV CKT 1
KIRBY - MCLELLAN 115KV CKT 1	08WP	107	125	126	SPP-SWPS-03: ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1 and GRAPEVINE INTYERCHANGE - NICHOLS STATION 230KV CKT 1
MCLELLAN RURAL - MCLELLAN 115KV CKT 1	08WP	107	124	139	SPP-SWPS-03: ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1 and GRAPEVINE INTYERCHANGE - NICHOLS STATION 230KV CKT 1
MCLELLAN RURAL - SHAMROCK 115KV CKT 1	08WP	107	121	139	ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1
ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1	08WP	319	120	145	BASE CASE
CLINTON - ELK CITY 138KV CKT 1	08WP	143	127	160	FINNEY STATION - HOLCOMB 345KV CKT 1
TUCO (TUCO XX4) 345/230/13.2KV TRANSFORMER CKT 1	08WP	560	131	162	SPP-SWPS-03: ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1 and GRAPEVINE INTYERCHANGE - NICHOLS STATION 230KV CKT 1
POTTER COUNTY (POTTR CO) 345/230/13.2KV TRANSFORMER CKT 1	08WP	560	118	268	SPP-SWPS-03: ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1 and GRAPEVINE INTYERCHANGE - NICHOLS STATION 230KV CKT 1
RUSSELL - ALTUS TAP 138KV CKT 1	08WP	72	119	282	SPP-SWPS-03: ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1 and GRAPEVINE INTYERCHANGE - NICHOLS STATION 230KV CKT 1
2011 Summer Peak Model					
ELK CITY (AEPW-WFEC TIE) 69KV CKT 1	11SP	39	137	0	FINNEY STATION - HOLCOMB 345KV CKT 1
CONWAY - KIRBY 115KV CKT 1	11SP	180	128	0	NICHOLS STATION - YARNELL3 115KV CKT 1
PALO DURO - RANDALL COUNTY INTERCHANGE 115KV CKT 1	11SP	99	124	0	AMARILLO S INTERCHANGE - SWISHER COUNTY INTERCHANGE 230KV CKT 1
HAPPY INTERCHANGE - PALO DURO 115KV CKT 1	11SP	99	122	0	AMARILLO S INTERCHANGE - SWISHER COUNTY INTERCHANGE 230KV CKT 1

Table 4: Contingency Analysis (continued)

ELEMENT	SEASON	RATE (MVA)	LOADING (%)	ATC (MW)	CONTINGENCY
2011 Summer Peak Model (continued)					
ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	11SP	287	146	28	FINNEY STATION - HOLCOMB 345KV CKT 1
SHAMROCK (SHAMRCK1) 138/69/KV TRANSFORMER CKT 1	11SP	69	128	48	FINNEY STATION - HOLCOMB 345KV CKT 1
SPS-SPP TIES: TUCO INTERCHANGE - O.K.U. 345KV CKT 1, ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1, MCLELLAN RURAL - SHAMROCK 115KV CKT 1, FINNEY - HOLCOMB 345KV CKT 1, TEXAS COUNTY INTERCHANGE PHASE SHIFTER TRANSFORMER CKT 1, JERICHO 115/69/14.4KV TRANSFORMER CKT 1	11SP	620	145	90	BASE CASE
KIRBY - MCLELLAN 115KV CKT 1	11SP	90	114	154	ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1
MCLELLAN RURAL - MCLELLAN 115KV CKT 1	11SP	90	112	189	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1	11SP	351	120	207	FINNEY STATION - HOLCOMB 345KV CKT 1
SHAMROCK (SHAMRCK2) 115/69/KV TRANSFORMER CKT 1	11SP	69	113	232	FINNEY STATION - HOLCOMB 345KV CKT 1
MCLELLAN RURAL - SHAMROCK 115KV CKT 1	11SP	90	107	280	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
JERICHO (JERIC2WT) 115/69/14.4KV TRANSFORMER CKT 1	11SP	46	103	342	FINNEY STATION - HOLCOMB 345KV CKT 1
ELK CITY (ELKCTY-4) 138/69/13.8KV TRANSFORMER CKT 1	11SP	72	101	377	FINNEY STATION - HOLCOMB 345KV CKT 1
2011 Winter Peak Model					
SPS-SPP TIES: TUCO INTERCHANGE - O.K.U. 345KV CKT 1, ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1, MCLELLAN RURAL - SHAMROCK 115KV CKT 1, FINNEY - HOLCOMB 345KV CKT 1, TEXAS COUNTY INTERCHANGE PHASE SHIFTER TRANSFORMER CKT 1, JERICHO 115/69/14.4KV TRANSFORMER CKT 1	11WP	620	192	0	BASE CASE
ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	11WP	287	182	0	FINNEY STATION - HOLCOMB 345KV CKT 1
SHAMROCK (SHAMRCK1) 138/69/KV TRANSFORMER CKT 1	11WP	69	174	0	ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1
SHAMROCK (SHAMRCK2) 115/69/KV TRANSFORMER CKT 1	11WP	69	163	0	SPP-SWPS-03: ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1 and GRAPEVINE INTYERCHANGE - NICHOLS STATION 230KV CKT 1
ELK CITY (AEPW-WFEC TIE) 69KV CKT 1	11WP	39	151	0	FINNEY STATION - HOLCOMB 345KV CKT 1
JERICHO (JERIC2WT) 115/69/14.4KV TRANSFORMER CKT 1	11WP	46	138	0	ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1
NO SOLUTION REACHED	11WP			0	SPP-SWPS-04a: LAMAR - FINNEY STATION 345KV CKT 1 and FINNEY STATION - POTTER COUNTY 345KV CKT 1
NO SOLUTION REACHED	11WP			0	OKLAUNION - TUCO INTERCHANGE 345KV CKT 1
ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1	11WP	351	149	42	FINNEY STATION - HOLCOMB 345KV CKT 1
LAKE PAULINE - RUSSELL 138KV CKT 1	11WP	72	135	92	SPP-SWPS-03: ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1 and GRAPEVINE INTYERCHANGE - NICHOLS STATION 230KV CKT 1
LAKE PAULINE - ELDORADO 69KV CKT 1	11WP	20	121	116	SPP-SWPS-03: ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1 and GRAPEVINE INTYERCHANGE - NICHOLS STATION 230KV CKT 1
KIRBY - MCLELLAN 115KV CKT 1	11WP	107	118	133	ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1
MCLELLAN RURAL - MCLELLAN 115KV CKT 1	11WP	107	116	155	ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1
ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1	11WP	319	117	170	BASE CASE
CLINTON - ELK CITY 138KV CKT 1	11WP	143	125	177	FINNEY STATION - HOLCOMB 345KV CKT 1
TUCO (TUCO XX4) 345/230/13.2KV TRANSFORMER CKT 1	11WP	560	124	196	ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1
MCLELLAN RURAL - SHAMROCK 115KV CKT 1	11WP	107	113	205	ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1
CONWAY - KIRBY 115KV CKT 1	11WP	218	111	281	NICHOLS STATION - YARNELL3 115KV CKT 1
RUSSELL - ALTUS TAP 138KV CKT 1	11WP	72	113	300	ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1

Table 4: Contingency Analysis (continued)

ELEMENT	SEASON	RATE (MVA)	LOADING (%)	ATC (MW)	CONTINGENCY
2011 Winter Peak Model (continued)					
POTTER COUNTY (POTTR CO) 345/230/13.2KV TRANSFORMER CKT 1	11WP	560	111	307	SPP-SWPS-03: ELK CITY - GRAPEVINE INTERCHANGE 230KV CKT 1 and GRAPEVINE INTYERCHANGE - NICHOLS STATION 230KV CKT 1
ELK CITY (ELKCTY-4) 138/69/13.8KV TRANSFORMER CKT 1	11WP	72	101	380	FINNEY STATION - HOLCOMB 345KV CKT 1
2016 Summer Peak Model					
CONWAY - KIRBY 115KV CKT 1	16SP	180	124	0	NICHOLS STATION - YARNELL3 115KV CKT 1
ELK CITY (AEPW-WFEC TIE) 69KV CKT 1	16SP	39	102	359	NICHOLS STATION - YARNELL3 115KV CKT 1

Note: When transmission service associated with this interconnection is evaluated, the loading of the facilities listed in this table may be greater due to higher priority reservations. If the loading of a facility is higher, the level of ATC will be lower.

Conclusion

The minimum cost of interconnecting the Customer's interconnection request is estimated at $3,000,000 for Direct Assignment facilities and Network Upgrades listed in Tables 1 and 2. These costs exclude upgrades of other transmission facilities that were listed in Table 3 of which are Network Constraints. At this time, the cost estimates for other Direct Assignment facilities including those in Table 1 have not been defined by the Customer. In addition to the Customer's proposed interconnection facilities, the Customer will be responsible for installing 20 Mvar of 34.5 kV capacitors in the Customer substation for reactive support. Dynamic stability analysis will determine if a portion of this should be dynamic (SVC). As stated earlier, some but not all of the local projects that were previously queued are assumed to be in service in this Feasibility Study.

In Table 4, a value of Available Transfer Capability (ATC) associated with each overloaded facility is included. These values may be used by the Customer to determine lower generation capacity levels that may be installed. When transmission service associated with this interconnection is evaluated, the loading of the facilities listed in this table may be greater due to higher priority reservations. When a facility is overloaded for more than one contingency, only the highest loading on the facility for each season is included in the table.

These interconnection costs do not include any cost that may be associated with short circuit or transient stability analysis. These studies will be performed if the Customer signs a System Impact Study Agreement.

The required interconnection costs listed in Table 2 and other upgrades associated with Network Constraints listed in Table 3 do not include all costs associated with the deliverability of the energy to final customers. These costs are determined by separate studies if the Customer requests transmission service through Southwest Power Pool's OASIS.

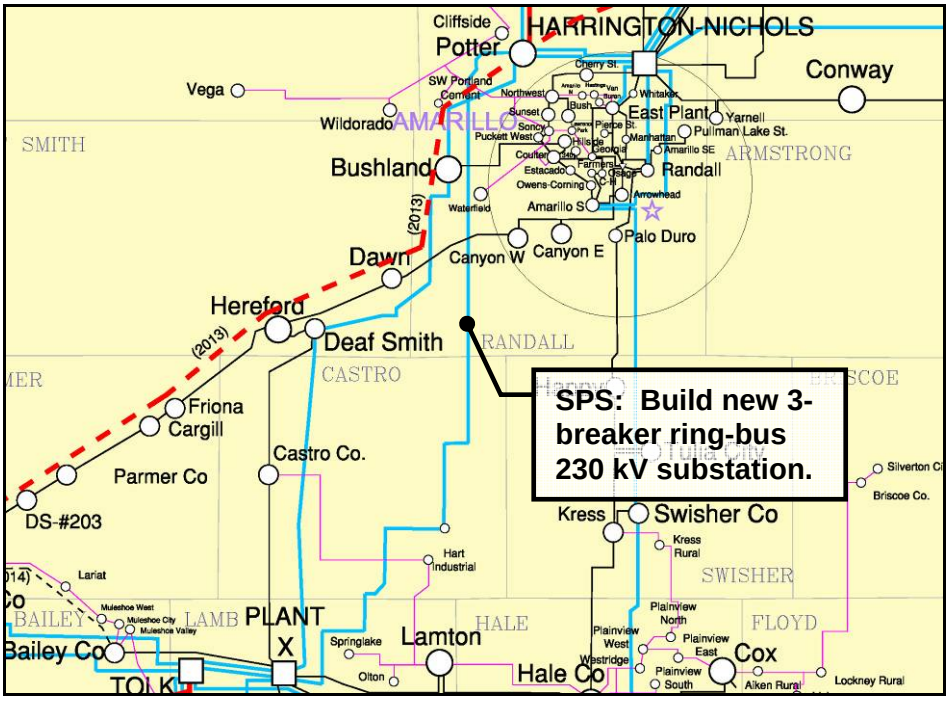

FIGURE 2. MAP OF THE LOCAL AREA