SPP Southwest Power Pool

Feasibility Study For Generation Interconnection Request GEN-2006-034

SPP Tariff Studies
(#GEN-2006-034)

February, 2007

Executive Summary

<OMITTED TEXT> (Customer) has requested a Feasibility Study for the purpose of interconnecting 81MW of wind generation within the control area of Sunflower Electric Cooperative (SUNC) in Sherman County, Kansas. The proposed point of interconnection is a new switching station in the existing Ruleton – Sharon Springs 115kV, which is owned by SUNC. The proposed in-service date is August 30, 2008.

Power flow analysis has indicated that for the powerflow cases studied, it is possible to interconnect the 81MW 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 12Mvars of 34.5kV capacitor bank(s) in the Customer's collector substation on the 34.5kV 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 81MW of generation on the existing Ruleton – Sharon Springs 115kV transmission line consists building a new 115kV three breaker ring bus switching station. Customer did not propose a specific route for the 115kV line extending to serve its 115-34.5kV 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 81MW of generation is $750,000. These costs are shown in Table 2. Other Network Constraints in the Midwest Electric Cooperative (MIDW), Southwestern Public Service Company (SPS), SUNC, and West Plains (WEPL) 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 115kV line from the Customer substation into the new 115kV ring bus. This cost does not include the Customer's 115-34.5kV substation or the 34.5kV, 12Mvar 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 MIDW, SPS, SUNC, and WEPL control areas 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 81MW of generation within the control area of Sunflower Electric Cooperative (SUNC) in Sherman County, Kansas. The proposed method of interconnection is to build a new three breaker ring bus switching station in the existing Ruleton – Sharon Springs 115kV transmission line, which is owned by SUNC. The proposed in-service date is August 30, 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 81MW consist of adding a new 115kV three breaker ring bus station in the existing Ruleton – Sharon Springs 115kV transmission line owned by SUNC. This substation shall be constructed and maintained by SUNC. The Customer did not propose a route of its 115kV line to serve its 115/34.5kV 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 115kV three breaker ring switching station and reconfiguring the required interconnection facilities, is estimated at $750,000. Other Network Constraints in the Midwest Electric Cooperative (MIDW), Southwestern Public Service Company (SPS), SUNC, and West Plains (WEPL) 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 115kV facilities from the Customer substation into the new 115kV ring bus. The Customer is responsible for these 115kV facilities up to the point of interconnection. This cost also does not include the Customer's 115-34.5kV substation, which should be determined by the Customer.

The costs of interconnecting the facility to the SUNC transmission system are listed in Table 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 (2006 DOLLARS)
Customer – 115-34.5 kV Substation facilities.	*
Customer – 115kV transmission line facilities between Customer facilities and the new 115kV ring bus.	*
Customer - Right-of-Way for Customer facilities.	*
Customer – 34.5kV, 12Mvar 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 (2006 DOLLARS)
SUNC – Build 115kV, 3 breaker ring bus switching station. Station to include breakers, switches, control relaying, high speed communications, metering and related equipment and all structures.	$750,000
Total	*****

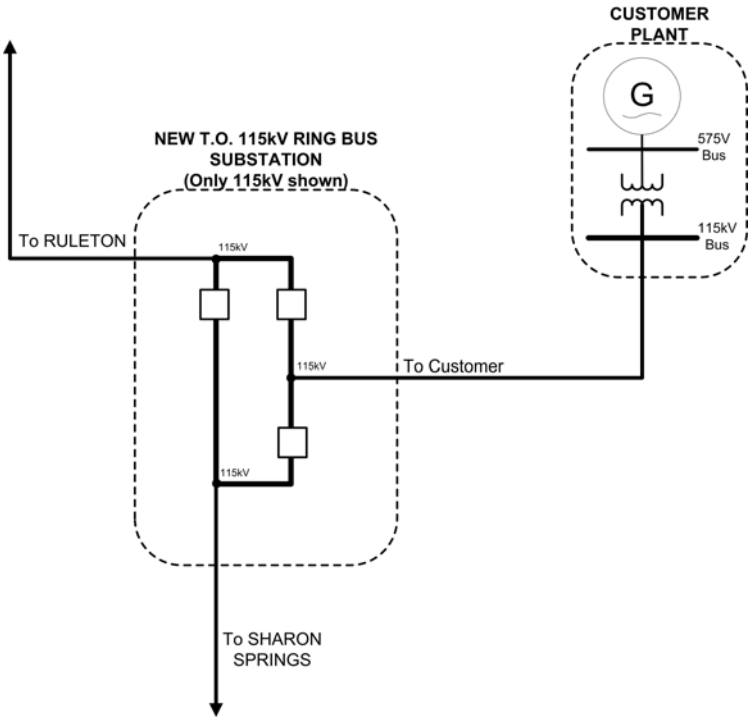

Figure 1: Proposed Interconnection
(Final substation design to be determined

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 August 30, 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 81MW and location, additional criteria violations will occur on the existing MIDW, SPS, SUNC, and WEPL 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 12Mvar of capacitor banks in their substation on the 34.5kV 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 American Electric Power West (AEPW), Grand River Dam Authority (GRDA), Kansas City Power & Light (KCPL), Midwest Energy (MIDW), Missouri Public Service (MIPU), Oklahoma Gas and Electric OKGE, Southwestern Public Service Company (SPS), Sunflower Electric Power Corporation (SUNC), West Plains (WEPL), Westar (WESTAR), 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
MIDW	HAYS PLANT - SOUTH HAYS 115KV CKT 1
MIDW	HAYS PLANT - VINE STREET 115KV CKT 1
MIDW	HEIZER 115/69KV TRANSFORMER CKT 1
MIDW	KNOLL - VINE STREET 115KV CKT 1
MIDW	SEWARD - ST JOHN 115KV CKT 1
SPS	HARRINGTON STATION - NICHOLS STATION 230KV CKT 1
SPS	MOORE 230/115KV TRANSFORMER CKT 1
SPS	POTTER COUNTY 345/230/13.2KV TRANSFORMER CKT 1
SPS	RANDALL COUNTY INTERCHANGE 230/115KV TRANSFORMER CKT 1
SPS	TERRY COUNTY - LYNTEGAR REC/BROWNFIELD 69KV CKT 1
SUNC	BEELER - DIGHTON TAP 115KV CKT 1
SUNC	BEELER - NESS CITY 115KV CKT 1
SUNC	DIGHTON TAP - MANNING TAP 115KV CKT 1
SUNC	GEN-2006-034 TAP 115 - KANARADO 115KV CKT 1
SUNC	HOLCOMB 345/115/22KV TRANSFORMER CKT 1
SUNC	KANARADO - NATIONAL SUNFLOWER INDUSTRY TAP 115KV CKT 1
SUNC	NATIONAL SUNFLOWER INDUSTRY TAP - RULETON 115KV CKT 1
WEPL	ALEXANDER - NEKOMA 115KV CKT 1
WEPL	ALEXANDER - NESS CITY 115KV CKT 1
WEPL	CIMARRON RIVER PLANT - NORTH LIBERAL TAP 115KV CKT 1
WEPL	CIMARRON RIVER TAP - EAST LIBERAL 115KV CKT 1
WEPL	CUDAHY - CIMMARON RIVER TAP 115KV CKT 1
WEPL	CUDAHY - JUDSON LARGE 115KV CKT 1
WEPL	GREAT BEND TAP - SEWARD 115KV CKT 1
WEPL	GREENSBURG - JUDSON LARGE 115KV CKT 1
WEPL	GREENSBURG - SUN CITY 115KV CKT 1
WEPL	HARPER - MEDICINE LODGE 138KV CKT 1
WEPL	HARPER - MILAN TAP 138KV CKT 1
WEPL	MEDICINE LODGE - SUN CITY 115KV CKT 1
WEPL	MEDICINE LODGE (MED-LDG4) 138/115/2.72KV TRANSFORMER CKT 1
WEPL	MULLERGREN - SPEARVILLE 230KV CKT 1
WEPL	PRATT - ST JOHN 115KV CKT 1
WEPL	SPEARVILLE 345/230/115KV TRANSFORMER CKT 1

Table 4: Contingency Analysis

ELEMENT	SEASON	RATE (MVA)	LOADING (%)	ATC (MW)	CONTINGENCY
2008 SUMMER PEAK					
NO SOLUTION FOUND	08SP			0	FINNEY - GEN-2003-013 345KV CKT 1
NO SOLUTION FOUND	08SP			0	GEN-2003-013 - POTTER COUNTY 345KV CKT 1
NO SOLUTION FOUND	08SP			0	POTTER COUNTY 345/230/13.2KV TRANSFORMER CKT 1
GREENSBURG - JUDSON LARGE 115KV CKT 1	08SP	80	212	0	MULLERGREN - SPEARVILLE 230KV CKT 1
MEDICINE LODGE - SUN CITY 115KV CKT 1	08SP	80	190	0	MULLERGREN - SPEARVILLE 230KV CKT 1
HAYS PLANT - SOUTH HAYS 115KV CKT 1	08SP	88	178	0	KNOLL - S HAYS6 230 230KV CKT 1
MEDICINE LODGE (MED-LDG4) 138/115/2.72KV TRANSFORMER CKT 1	08SP	65	162	0	HOLCOMB - SPEARVILLE 345KV CKT 1
HAYS PLANT - VINE STREET 115KV CKT 1	08SP	88	151	0	KNOLL - S HAYS6 230 230KV CKT 1
SEWARD - ST JOHN 115KV CKT 1	08SP	80	149	0	CIRCLE - MULLERGREN 230KV CKT 1
HARPER - MEDICINE LODGE 138KV CKT 1	08SP	72	147	0	HOLCOMB - SPEARVILLE 345KV CKT 1
MEDICINE LODGE (MED-LDG4) 138/115/2.72KV TRANSFORMER CKT 1	08SP	56	146	0	BASE CASE
KNOLL - VINE STREET 115KV CKT 1	08SP	88	143	0	KNOLL - S HAYS6 230 230KV CKT 1
MULLERGREN - SPEARVILLE 230KV CKT 1	08SP	355	140	0	HOLCOMB - SPEARVILLE 345KV CKT 1
SPEARVILLE 345/230/115KV TRANSFORMER CKT 1	08SP	336	126	0	HOLCOMB - SPEARVILLE 345KV CKT 1
POTTER COUNTY 345/230/13.2KV TRANSFORMER CKT 1	08SP	560	125	0	TOLK 2 GENERATOR OUTAGE (GEN:51442 1)
HEIZER 115/69KV TRANSFORMER CKT 1	08SP	24	123	0	S HAYS 6 230 - MULLERGREN 230KV CKT 1
ALEXANDER - NESS CITY 115KV CKT 1	08SP	101	121	0	MULLERGREN - SPEARVILLE 230KV CKT 1
GREAT BEND TAP - SEWARD 115KV CKT 1	08SP	90	121	0	CIRCLE - MULLERGREN 230KV CKT 1
GREENSBURG - SUN CITY 115KV CKT 1	08SP	130	121	0	MULLERGREN - SPEARVILLE 230KV CKT 1
DIGHTON TAP - MANNING TAP 115KV CKT 1	08SP	98	119	0	MULLERGREN - SPEARVILLE 230KV CKT 1
ALEXANDER - NEKOMA 115KV CKT 1	08SP	101	114	0	MULLERGREN - SPEARVILLE 230KV CKT 1
BEELER - DIGHTON TAP 115KV CKT 1	08SP	98	111	0	MULLERGREN - SPEARVILLE 230KV CKT 1
MULLERGREN - SPEARVILLE 230KV CKT 1	08SP	330	109	0	BASE CASE
BEELER - NESS CITY 115KV CKT 1	08SP	98	107	0	MULLERGREN - SPEARVILLE 230KV CKT 1
2008 WINTER PEAK					
NO SOLUTION FOUND	08WP			0	POTTER COUNTY 345/230/13.2KV TRANSFORMER CKT 1
GREENSBURG - JUDSON LARGE 115KV CKT 1	08WP	80	168	0	MULLERGREN - SPEARVILLE 230KV CKT 1
MEDICINE LODGE (MED-LDG4) 138/115/2.72KV TRANSFORMER CKT 1	08WP	56	161	0	HOLCOMB - SPEARVILLE 345KV CKT 1
HARPER - MEDICINE LODGE 138KV CKT 1	08WP	72	155	0	2003-13 345 - POTTER COUNTY INTERCHANGE 345KV CKT 1
MEDICINE LODGE - SUN CITY 115KV CKT 1	08WP	80	153	0	MULLERGREN - SPEARVILLE 230KV CKT 1
MEDICINE LODGE (MED-LDG4) 138/115/2.72KV TRANSFORMER CKT 1	08WP	56	145	0	BASE CASE
SEWARD - ST JOHN 115KV CKT 1	08WP	80	142	0	CIRCLE - MULLERGREN 230KV CKT 1
SPEARVILLE 345/230/115KV TRANSFORMER CKT 1	08WP	336	118	0	HOLCOMB - SPEARVILLE 345KV CKT 1
HARPER - MILAN TAP 138KV CKT 1	08WP	96	104	33	GEN-2003-013 345 - POTTER COUNTY INTERCHANGE 345KV CKT 1

Table 4: Contingency Analysis (continued)

ELEMENT	SEASON	RATE (MVA)	LOADING (%)	ATC (MW)	CONTINGENCY
2011 SUMMER PEAK					
NO SOLUTION FOUND	08SP			0	GEN-2003-013 - POTTER COUNTY 345KV CKT 1
NO SOLUTION FOUND	08SP			0	POTTER COUNTY 345/230/13.2KV TRANSFORMER CKT 1
GREENSBURG - JUDSON LARGE 115KV CKT 1	11SP	80	174	0	MULLERGREN - SPEARVILLE 230KV CKT 1
MEDICINE LODGE (MED-LDG4) 138/115/2.72KV TRANSFORMER CKT 1	11SP	65	161	0	HOLCOMB - SPEARVILLE 345KV CKT 1
MEDICINE LODGE - SUN CITY 115KV CKT 1	11SP	80	152	0	MULLERGREN - SPEARVILLE 230KV CKT 1
HARPER - MEDICINE LODGE 138KV CKT 1	11SP	72	147	0	2003-13 345 - FINNEY STATION 345KV CKT 1
MEDICINE LODGE (MED-LDG4) 138/115/2.72KV TRANSFORMER CKT 1	11SP	56	139	0	BASE CASE
POTTER COUNTY 345/230/13.2KV TRANSFORMER CKT 1	11SP	560	131	0	TOLK (GEN:51441 1)
MULLERGREN - SPEARVILLE 230KV CKT 1	11SP	355	126	0	HOLCOMB - SPEARVILLE 345KV CKT 1
SEWARD - ST JOHN 115KV CKT 1	11SP	80	125	0	GREENSBURG - JUDSON LARGE 115KV CKT 1
SPEARVILLE 345/230/115KV TRANSFORMER CKT 1	11SP	336	121	0	HOLCOMB - SPEARVILLE 230KV CKT 1
RANDALL COUNTY INTERCHANGE 230/115KV TRANSFORMER CKT 1	11SP	259	106	0	AMARILLO S INTERCHANGE – NICHOLS STATION 230KV CKT 1
GREAT BEND TAP - SEWARD 115KV CKT 1	11SP	90	105	0	GREENSBURG - JUDSON LARGE 115KV CKT 1
PRATT - ST JOHN 115KV CKT 1	11SP	80	102	0	GREENSBURG - SUN CITY 115KV CKT 1
GEN-2006-034 TAP 115 - KANARADO 115KV CKT 1	11SP	98	108	68	MINGO - SETAB 345KV CKT 1
KANARADO - NATIONAL SUNFLOWER INDUSTRY TAP 115KV CKT 1	11SP	98	106	71	MINGO - SETAB 345KV CKT 1
NATIONAL SUNFLOWER INDUSTRY TAP – RULETON 115KV CKT 1	11SP	98	104	75	MINGO - SETAB 345KV CKT 1
2011 WINTER PEAK					
MEDICINE LODGE (MED-LDG4) 138/115/2.72KV TRANSFORMER CKT 1	11WP	65	166	0	2003-13 345 - POTTER COUNTY 2003-14 INTERCHANGE 345KV CKT 1
GREENSBURG - JUDSON LARGE 115KV CKT 1	11WP	80	157	0	MULLERGREN - SPEARVILLE 230KV CKT 1
HARPER - MEDICINE LODGE 138KV CKT 1	11WP	72	152	0	2003-13 345 - POTTER COUNTY 2003-14 INTERCHANGE 345KV CKT 1
MEDICINE LODGE - SUN CITY 115KV CKT 1	11WP	80	142	0	MULLERGREN - SPEARVILLE 230KV CKT 1
MEDICINE LODGE (MED-LDG4) 138/115/2.72KV TRANSFORMER CKT 1	11WP	56	141	0	BASE CASE
HOLCOMB 345/115/22KV TRANSFORMER CKT 1	11WP	336	134	0	SPEARVILLE - GEN-2005-012 345KV CKT 1
SEWARD - ST JOHN 115KV CKT 1	11WP	80	131	0	CIRCLE - MULLERGREN 230KV CKT 1
SPEARVILLE 345/230/115KV TRANSFORMER CKT 1	11WP	336	118	0	HOLCOMB - SPEARVILLE 345KV CKT 1
2016 SUMMER PEAK					
POTTER COUNTY 345/230/13.2KV TRANSFORMER CKT 1	16SP	560	999	0	OKLAUNION (GEN:59991 1)
GREENSBURG - JUDSON LARGE 115KV CKT 1	16SP	80	162	0	MULLERGREN - SPEARVILLE 230KV CKT 1
MEDICINE LODGE (MED-LDG4) 138/115/2.72KV TRANSFORMER CKT 1	16SP	65	150	0	HOLCOMB - SPEARVILLE 345KV CKT 1
MEDICINE LODGE - SUN CITY 115KV CKT 1	16SP	80	140	0	MULLERGREN - SPEARVILLE 230KV CKT 1

Table 4: Contingency Analysis (continued)

ELEMENT	SEASON	RATE (MVA)	LOADING (%)	ATC (MW)	CONTINGENCY
HARPER - MEDICINE LODGE 138KV CKT 1	16SP	72	136	0	HOLCOMB - SPEARVILLE 345KV CKT 1
MEDICINE LODGE (MED-LDG4) 138/115/2.72KV TRANSFORMER CKT 1	16SP	56	124	0	BASE CASE
MULLERGREN - SPEARVILLE 230KV CKT 1	16SP	355	123	0	HOLCOMB - SPEARVILLE 345KV CKT 1
SPEARVILLE 345/230/115KV TRANSFORMER CKT 1	16SP	336	121	0	HOLCOMB - SPEARVILLE 345KV CKT 1
SEWARD - ST JOHN 115KV CKT 1	16SP	80	120	0	GREENSBURG - JUDSON LARGE 115KV CKT 1
CIMARRON RIVER PLANT - NORTH LIBERAL TAP 115KV CKT 1	16SP	115	112	0	CIMARRON RIVER TAP - EAST LIBERAL 115KV CKT 1
CIMARRON RIVER TAP - EAST LIBERAL 115KV CKT 1	16SP	120	107	0	CIMARRON RIVER PLANT - NORTH LIBERAL TAP 115KV CKT 1
CUDAHY - JUDSON LARGE 115KV CKT 1	16SP	130	106	0	HOLCOMB - SPEARVILLE 345KV CKT 1
MOORE 230/115KV TRANSFORMER CKT 1	16SP	168	105	0	E. LIBERAL - PRAI-XFR (50564) 115KV CKT 1
CUDAHY - CIMMARON RIVER TAP 115KV CKT 1	16SP	130	102	0	HOLCOMB - SPEARVILLE 345KV CKT 1
TERRY COUNTY - LYNTEGAR REC/BROWNFIELD 69KV CKT 1	16SP	54	101	0	HOLCOMB - SPEARVILLE 345KV CKT 1
GREAT BEND TAP - SEWARD 115KV CKT 1	16SP	90	103	14	GREENSBURG - JUDSON LARGE 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 $750,000 for Network Upgrade facilities listed in Table 2. These costs exclude upgrades of other transmission facilities 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 12Mvar of 34.5kV 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.

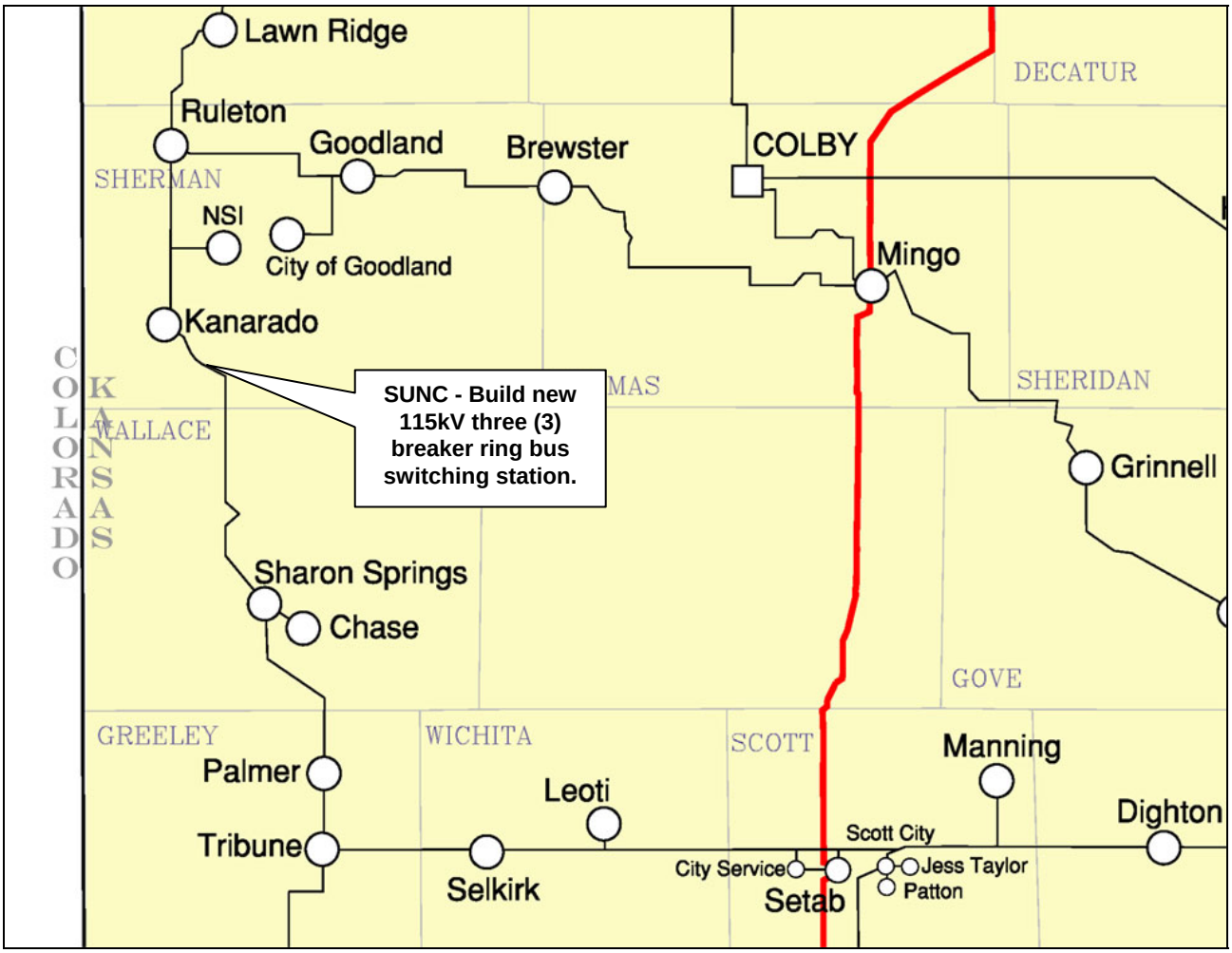

FIGURE 2. MAP OF THE LOCAL AREA