Name	C/O	Address	City	State	Zip
Joe Mitchell		6813 Zapata	Amarillo	TX	79109
Joe Rascoe		12601 Bell Street	Amarillo	TX	79118
Joel Bennett		12780 S. Coulter	Amarillo	TX	79119
Joel Young, Jr.		12401 Bell Street	Amarillo	TX	79118
John C. McBride		7680 Longoria Road	Amarillo	TX	79119
John Durr & Joe I. Durr		6260 Meredith Lane	Amarillo	TX	79118
John Livingston		12301 Bell Street	Amarillo	TX	79118
John Penner		12501 Bell Street	Amarillo	TX	79118
Julie Anderson		13665 FM 2590	Amarillo	TX	79119
K. L. Drury		12645 FM 2590	Amarillo	TX	79119
Keith Heying		2033 S. Travis Street	Amarillo	TX	79110
Kenneth Troy Hart		15881 FM 2590	Amarillo	TX	79119
LACLA LLP		15900 FM 2590	Amarillo	TX	79119-2542
Landria Baker		12100 San Saba Street	Amarillo	TX	79118
Laroy Gilbert		11580 S. Coulter	Amarillo	TX	79119
Larry G. Sanders		7404 Dreyfuss Drive	Amarillo	TX	79121
Laruth Patterson	c/o Woodna Nutt	P. O. Box 19044	Amarillo	TX	79114
Latham & Company		P. O. Box 229	Amarillo	TX	79105
Linda Frances Pittman		P. O. Box 1043	Amarillo	TX	79105
LKLK, Inc.	c/o James McClure	P. O. Box 7366	Amarillo	TX	79114
Manuel Noriega		P. O. Box 19982	Amarillo	TX	79114
Mark & Carolyn Christy		P. O. Box 8782	Amarillo	TX	79114
Marshall L. Shockey		6200 Meredith Lane	Amarillo	TX	79118
Marvin Jackson		11560 S. Coulter	Amarillo	TX	79119
Mary Garcia	c/o Justin Ruiz	2918 S. Roosevelt	Amarillo	TX	79103
McElroy Metal Buildings		500 Hamilton Road	Bossier City	LA	71111
Megan McKnight		12310 Bell Street	Amarillo	TX	79118
Melodie Browder		8409 Venice Drive	Amarillo	TX	79110
Micah Campbell		7780 Longoria Road	Amarillo	TX	79119
Michael Boyles		P. O. Box 2462	Amarillo	TX	79105
Mills Latham, et al		P. O. Box 229	Amarillo	TX	79105-0229
Milton Sauer Trust &	Patty Sauer Trust	6312 Hampton Road	Amarillo	TX	79109
Norman Dulaney		P. O. Box 1043	Amarillo	TX	79105
O'Brien Fund Trust 59		600 S. Tyler, Suite 1207	Amarillo	TX	79101
Odis Houk		16061 Hammon Street	Amarillo	TX	79118

Name	C/O	Address	City	State	Zip
Patsy J. Kryszak		12500 Bell Street	Amarillo	TX	79118
R. G. Costley		8801 Lone Star Rd.	Amarillo	TX	79119
Randall C. Buttrill		7822 Covington Pkwy	Amarillo	TX	79121
Randol G. Smith		14225 FM 2590	Amarillo	TX	79119
Rebecca Joy Dudensing		1630 E. 14th Street	Sweetwater	TX	79556
Recoop Farms, Inc.		1951 Hwy 514	Friona	TX	79035
Richard S. Jones		12750 Raymond Road	Amarillo	TX	79119
RJMBC Land & Equipment, Ltd.		5103 Red Oak Drive	Amarillo	TX	79110
Robert A. Baker		11801 Bell Street	Amarillo	TX	79118
Robert D. Lorenz		P. O. Box 457	Clinton	OK	73601
Robert E. Hayes		4117 Tulane Dr	Amarillo	TX	79109
Robert Foster		210 Bordeaux	Amarillo	TX	79119
Robert H. Bridges		7600 Longoria Road	Amarillo	TX	79119
Robert Wolf		13875 FM 2590	Amarillo	TX	79119
Robin & Linda Hand		6650 Lair Road	Amarillo	TX	79118
Rockrose Development, Inc.		3905 S. Bell Street	Amarillo	TX	79109
Roger Cape		P. O. Box 21143	Amarillo	TX	79114-3143
Section 68 Land Co.		3310 W. Interstate 40	Amarillo	TX	79102-2109
Sidney W. Raffkind		401 SW 12th, #201	Amarillo	TX	79101-4110
Spanky's Outdoor Services, Ltd	Attn James Lyon	P. O. Box 52528	Amarillo	TX	79159
Sterling A. Maples		6315 Chenot Drive	Amarillo	TX	79109
Steven McCoy, et al		6130 Meredith Lane	Amarillo	TX	79118
Storm & Peggy Sanchez		12655 Raymond Road	Amarillo	TX	79119
Susan Kay Waters		6230 Meredith Lane	Amarillo	TX	79118
Ted L. Moore		12350 FM 2590	Amarillo	TX	79119
The Aksys Group LLC		6501 Sheldon Road	Amarillo	TX	79109
Thomas Clark		6705 Lair Road	Amarillo	TX	79118
Thomas Kelley		P. O. Box 1123	Andalusia	AL	36420
Thomas Randall Roberts		12920 FM 2590	Amarillo	TX	79119
Tiffany Fetterman & Michelle Riggle		4622 N. Magnolia Ave, Apt 1	Chicago	IL	60640
Trailer & Body Service		11685 S. Western	Amarillo	TX	79118
Trenton C. Taylor		14155 FM 2590	Amarillo	TX	79119
Wayne Rhodes		1101 W. 5th Street	Friona	TX	79035
Weldon McClure Family, LTD	c/o James McClure	P. O. Box 7366	Amarillo	TX	79114
William D. Bridges		2208 S. Milam Street	Amarillo	TX	79109

Name	C/O	Address	City	State	Zip
William Dax Rattan		11775 FM 2590	Amarillo	TX	79119
William Drake		6706 Hatton Road	Amarillo	TX	79110
William James & Joseph Donald Foran		P. O. Box 1865	Amarillo	TX	79105
William M. & Victoria Ruzicka		12650 S. Coulter	Amarillo	TX	79119
William T. Quinlin		2012 Teckla Road	Amarillo	TX	79106
Wilma Braddy		14545 FM 2590	Amarillo	TX	79119
Zane Prescott Trust		3905 S. Bell Street	Amarillo	TX	79109

OVERSIZED MAP(S)

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Telephone: 806.378.2132
Facsimile: 806.378.2142

December 20, 2006

VIA CERTIFIED MAIL

Randy Criswell
City of Canyon
301 16th Street
Canyon, TX 79015

Dear Mr. Criswell:

Southwestern Public Service Company ("Southwestern") is filing an application with the Public Utility Commission of Texas ("PUCT") for a certificate of convenience and necessity ("CCN") for a transmission line project in Randall County, Texas. Southwestern is requesting the approval of the PUCT for this project.

Enclosed are a copy of Southwestern's newspaper notice that will be published in the Amarillo Globe News and a map of the proposed project. A copy of the complete application is available for review at Southwestern's offices at Chase Tower, 600 S. Tyler Street, Suite 2300, Amarillo, Texas, 79101.

If you have any questions or need additional information, please call me at (806) 378-2132 or Mr. James Bagley at (806) 378-2868.

Sincerely,

Robert B Sparks

Robert B. Sparks, Supervisor
Siting and Land Rights

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P. O. Box 1261
Amarillo, Texas 79105-1261
Telephone: 806.378.2132
Facsimile: 806.378.2142

December 20, 2006

VIA CERTIFIED MAIL

Judge Ernie Houdashell
400 16th Street, Suite 230
Canyon, TX 79015

Dear Honorable Judge Houdashell:

Southwestern Public Service Company ("Southwestern") is filing an application with the Public Utility Commission of Texas ("PUCT") for a certificate of convenience and necessity ("CCN") for a transmission line project in Randall County, Texas. Southwestern is requesting the approval of the PUCT for this project.

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If you have any questions or need additional information, please call me at (806) 378-2132 or Mr. James Bagley at (806) 378-2868.

Sincerely,

Robert B Sparks

Robert B. Sparks, Supervisor
Siting and Land Rights

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P. O. Box 1261
Amarillo, Texas 79105-1261
Telephone: 806.378.2132
Facsimile: 806.378.2142

December 20, 2006

VIA CERTIFIED MAIL

Alan Taylor
City of Amarillo
P. O. Box 1971
Amarillo, TX 79105-1971

Dear Mr. Taylor:

Southwestern Public Service Company ("Southwestern") is filing an application with the Public Utility Commission of Texas ("PUCT") for a certificate of convenience and necessity ("CCN") for a transmission line project in Randall County, Texas. Southwestern is requesting the approval of the PUCT for this project.

Enclosed are a copy of Southwestern's newspaper notice that will be published in the Amarillo Globe News and a map of the proposed project. A copy of the complete application is available for review at Southwestern's offices at Chase Tower, 600 S. Tyler Street, Suite 2300, Amarillo, Texas, 79101.

If you have any questions or need additional information, please call me at (806) 378-2132 or Mr. James Bagley at (806) 378-2868.

Sincerely,

Robert B Sparks

Robert B. Sparks, Supervisor
Siting and Land Rights

NOTICE OF SOUTHWESTERN PUBLIC SERVICE COMPANY'S APPLICATION TO AMEND ITS CERTIFICATE OF CONVENIENCE AND NECESSITY FOR A PROPOSED TRANSMISSION LINE WITHIN RANDALL COUNTY, TEXAS PUC DOCKET NO. 33602

Southwestern Public Service Company (SPS), in accordance with the rules of the Public Utility Commission of Texas (PUCT), hereby gives notice of its intent to obtain a Certificate of Convenience and Necessity (CCN) to build a new transmission line in Randall County, Texas. These facilities include approximately 5.41 miles of new 115 kV transmission line. The estimated cost of this project is $3,714,009. The locations of the routes, which are comprised of different line segments, are described below and shown on the attached map. The PUCT will approve only one of these routes.

The proposed project includes the construction of a 115 kV single-pole steel structure transmission line between the Amarillo South Interchange and the new Spring Draw Substation site in Randall County, Texas. The preferred route is comprised of Segments A and B while the alternate routes include a combination of Segments B, C, D, E, F, G, H, I, J, K and L. Segment A begins 0.26 miles north of Sundown Lane and 0.6 miles east of I-27 and goes south for approximately 1.8 miles, turns west approximately 0.25 miles, south approximately 0.27 miles, and west approximately 0.37 miles. Segment A then turns south for approximately 0.5 miles, then east approximately 0.13 miles, south approximately 0.75 miles to Lair Road, then west approximately 0.55 miles along Lair Road to the west side of I-27 and the north terminus of Segment B. Segment B starts at I-27 and FM 2219, the end of Segment A, and goes south along the west frontage road approximately 0.5 miles and then turns west to connect to the new Spring Draw Substation site for a total segment length of 0.79 miles. Segment C is approximately 0.26 miles and extends from the existing Circuit V-44 south along Coulter Road to Sundown Lane. Segment D begins at Coulter Road and Sundown Lane and goes west along Sundown Lane approximately 1.0 mile to FM 2590 then turns south along FM 2590 for approximately 1.99 miles. Segment E begins at the south terminus of Segment D and continues south along FM 2590 for approximately 1.66 miles then turns east for approximately 0.65 miles to connect to the

new Spring Draw Substation site. Segment F goes south from Circuit V-44 for approximately 1.14 miles along the west frontage road of I-27. Segment G begins at the terminus of Segment F and goes west approximately 0.19 miles, from the I-27 frontage road to Coulter Road. Segment H starts at the intersection of Sundown Lane and Coulter Road and goes south along Coulter Road approximately 0.87 miles to the terminus of Segment G. Segment I goes south from the intersection of Segments G and H and continues south along Coulter Road approximately 0.94 miles to Longoria Road. Segment J goes south along the west frontage road of I-27 from the intersection of Segments F and G for approximately 0.95 miles to Longoria Road and the south terminus of Segment I. Segment K begins at the intersection of Segments I and J extends west along Longoria Road for approximately 1.0 mile to FM 2590. Segment L is approximately 1.30 miles and starts at the intersection of Segments I, J and L and extends south along the west frontage road of I-27 to the intersection of Segments A, B and K.

Maps showing the foregoing preferred and alternate routes may be reviewed at SPS's office, 601 S. Tyler, Amarillo, Texas, by contacting Sean Frederiksen at 806-378-2436. Persons wishing a copy of these maps should contact James Bagley at 806-378-2868.

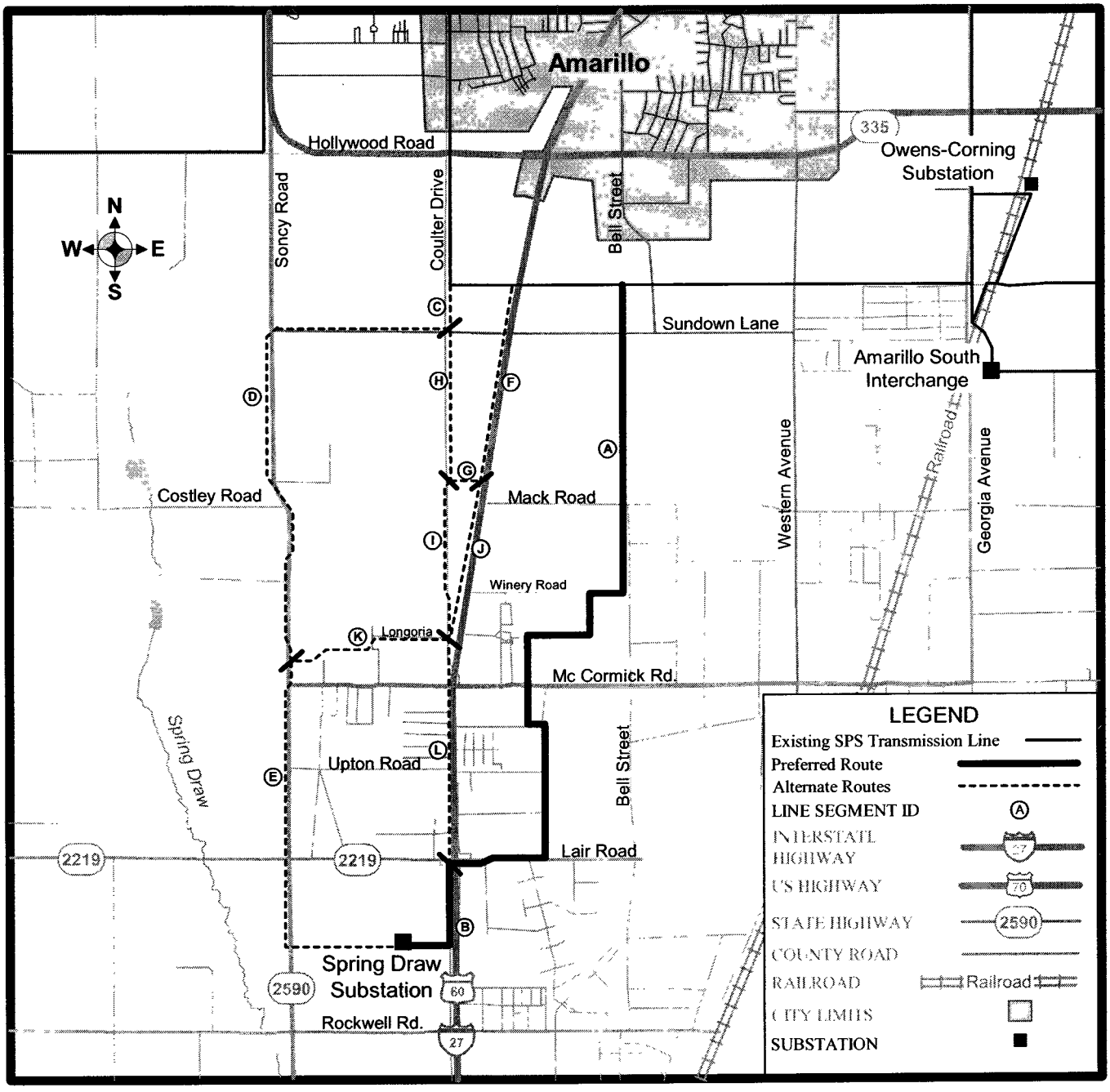
Persons with questions about PUCT Docket No. 33602 should contact Brad Sparks at 806-378-2132 or James Bagley 806-378-2868. Persons who wish to intervene in the proceeding or comment upon action sought, should mail their requests to intervene or their comments (along with 10 copies of the letter) to:

Public Utility Commission of Texas
Central Records
Attn: Filing Clerk
1701 N. Congress Avenue
P. O. Box 13326
Austin, TX 78711-3326

The deadline for intervention in the proceeding is 45 days from the date this application was filed, and a letter requesting intervention should be received by the PUCT by that date.

The PUCT has developed a brochure titled "Landowners and Transmission Line Cases at the PUC." Copies of this brochure are available from SPS by contacting Brad Sparks at 806-378-

2132 or James Bagley at 806-378-2868 or may be downloaded from the PUCT's website at www.puc.state.tx.us. To obtain additional information about this case, contact the PUCT at 512-936-7120 or 888-782-8477. Hearing- and speech-impaired individuals with text telephones (TTY) may contact the PUCT at 512-936-7136 or toll free at 800-735-2989.


Amarillo
Hollywood Road
335
Owens-Corning Substation
Soncy Road
Coulter Drive
Bell Street
N
W
E
S
Sundown Lane
Amarillo South Interchange
Western Avenue
Railroad
Georgia Avenue
Costley Road
Mack Road
Winery Road
Longoria
Mc Cormick Rd.
Spring Draw
Upton Road
Bell Street
2219
2219
Lair Road
Spring Draw Substation
2590
60
Rockwell Rd.
27
LEGEND
Existing SPS Transmission Line
Preferred Route
Alternate Routes
LINE SEGMENT ID
INTERSTATE HIGHWAY
27
US HIGHWAY
70
STATE HIGHWAY
2590
COUNTY ROAD
RAILROAD
Railroad
CITY LIMITS
SUBSTATION

TRC

AN INTENSIVE CULTURAL RESOURCE SURVEY OF THE PROPOSED AMARILLO SOUTH INTERCHANGE TO SPRING DRAW SUBSTATION 115 kV TRANSMISSION LINE IN RANDALL COUNTY, TEXAS

TRC

AN INTENSIVE CULTURAL RESOURCE SURVEY OF THE PROPOSED AMARILLO SOUTH INTERCHANGE TO SPRING DRAW SUBSTATION 115 kV TRANSMISSION LINE IN RANDALL COUNTY, TEXAS

Prepared by
Toni R. Goar
and
Amador Minjares

Prepared for
Southwestern Public Service Company
Amarillo, Texas

Principal Investigator
Todd Howell, Ph.D.

TRC
4221-A Balloon Park Road NE
Albuquerque, New Mexico 87109

Project 54316

TRC Report No. 54316-C-01

November 2006

Abstract

Southwestern Public Service Company (SPS) proposes to construct a new substation and a 115 kV single-pole electric transmission line south-southwest of Amarillo, Texas. The Spring Draw Substation will be constructed approximately 0.3 miles west of Interstate 27 and approximately 0.5 miles south of FM 2219. The preferred route will include a combination of Segments B, C, D, E, F, G, H, I, J, K, and L while the five alternate routes include Segments B through L. This report presents the results of a site records check and intensive, pedestrian cultural resource survey for the transmission line in Randall County, Texas.

The investigation was conducted by TRC from September 11–12, 2006. The proposed project lies on private land and a Texas Antiquities Permit was not required; however, since the work will involve ground-disturbing activities, SPS authorized the study to identify and record nonrenewable cultural resources.

The site file check identified no previously recorded archaeological resources within 1.6 km (1.0 mile) of the project area. Likewise, no cultural properties within 1.6 km (1.0 mile) are listed on the National Register of Historic Places and there are no recorded Texas State Archeological Landmarks. Two isolated occurrences were recorded during the pedestrian survey. A total of 6 shovel tests were excavated along the proposed segments in areas with the potential to contain buried cultural deposits. No artifacts or cultural remains were located in the shovel tests.

Given that no significant cultural remains were encountered, cultural resource clearance is recommended for the project. If any cultural remains are uncovered during construction, it is recommended that the Texas Historical Commission be notified and their professional opinion be sought regarding the significance of the remains.

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1.0 Introduction

Between September 11 and 12, 2006, TRC performed a cultural resource survey for a proposed 115 kV single-pole electric transmission line and substation south of Amarillo, Randall County, Texas. The investigations included a record search and intensive, 100-percent-coverage, pedestrian survey of the proposed project route and seven alternative routes proposed route. Southwestern Public Service Company (SPS) proposes to build a 115 kilovolt (kV), singlepole, transmission line south of Amarillo, Texas.

Since the proposed work will involve ground-disturbing activities, SPS has requested the identification and recording of all nonrenewable cultural resources on the routes as part of the application for the Certificate of Convenience and Necessity, which will be submitted to the Public Utility Commission of Texas. The Public Utility Commission of Texas requires such activities to conform to the National Historic Preservation Act of 1966, as amended (PL 89-665) and the National Environmental Policy Act of 1969 (PL 91-852).

The field survey was performed by Toni R. Goar and Amador Minjares. Todd Howell served as Principal Investigator. The proposed transmission line is on private land and a Texas Antiquities Permit was not needed. However, field and report guidelines followed those advocated by the Texas Historical Commission (THC) (Texas Natural Resource Code of 1977, Title 9, Chapter 191, Section 191.052).

1.1 Project Location

The project area is located in the center of the South Plains or Llano Estacado of Randall County, approximately 8 miles (12.9km) south-southwest of Amarillo, Texas (Figure 1.1). The project area is located entirely on private lands. The project is located on the Buffalo Stadium (1960) United States Geological Survey (USGS) 7.5 minute quadrangle map. The proposed Spring Draw substation is at the Universal Transverse Mercator (UTM) coordinates (Zone 14): 233229E, 3882355N. Segment lengths are Segment A: 4.62 miles, Segment B: 0.79 miles, Segment C: 0.26 miles, Segment D: 2.99 miles, Segment E: 2.31 miles, Segment F: 1.14 miles, Segment G: 0.19 miles, Segment H: 0.87 miles, Segment I: 0.94 miles, Segment J: 0.95 miles, Segment K: 1.00 mile, Segment L 1.30 miles. The total length is 17.36 miles with 10.8 miles not thoroughly surveyed. Width surveyed was 100 feet (30.5 m). Total acreage is approximately 210 acres (84.98 ha).

1.2 Project Description

The preferred route is comprised of Segments A and B, while the alternate routes include a combination of Segments B, C, D, E, F, G, H, I, J, K, and L. Segment A begins 0.26 miles north of Sundown Lane and 0.6 miles east of I-27 and goes south for approximately 1.8 miles, turns west approximately 0.25 miles, south approximately 0.27 miles, and west approximately 0.37 miles. Segment A then turns south for approximately 0.5 miles, then east approximately 0.13 miles, south approximately 0.75 miles to Lair Road, then west approximately 0.55 miles along Lair Road to the west side of I-27 and the north terminus of Segment B. Segment B starts at I-27 and FM 2219, the end of Segment A, and goes south along the west frontage road approximately 0.5 miles and then turns west to connect to the new Spring Draw Substation site for a total segment length of 0.79 miles. Segment C is approximately 0.26 miles and extends from the existing Circuit V-44 south along Coulter Road to Sundown Lane. Segment D begins at Coulter Road and Sundown Lane and goes west along Sundown Lane approximately 1.0 mile to FM 2590 then turns south along FM 2590 for approximately 1.99 miles. Segment E begins at the south terminus of Segment D and continues south along FM 2590 for approximately 1.66 miles then turns east for approximately 0.65 miles to connect to the new Spring Draw Substation site. Segment F goes south from Circuit V-44 for approximately 1.14 miles along the west frontage road of I-27. Segment G begins at the

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2.0 Environmental Setting

2.1 Climate

The nearest climate station to the proposed project route is at the Amarillo International Airport, approximately 16.4 miles (26.4 kilometers) northeast of the project area center point. Data for this station show an average annual temperature range of 43.7–70.7°F (6.50–21.5°C), with a mean annual temperature of 57.2°F (14.0°C). Average annual precipitation is approximately 19.7 inches (50.0 centimeters) with most of the precipitation occurring as summer thunderstorms from May to October (Owenby and Ezell 1992). The airport station receives an average of 15.2 inches (38.6 centimeters) of snowfall each year (NOAA 2006).

2.2 Topography and Soils

The proposed project area lies in the center of the South Plains of the Southern High Plains or Llano Estacado (Handbook of Texas 2001). The region is characterized by low, rolling hills separated by flat-to-gently-sloping alluvial plains. Playas, or seasonally inundated lake basins are typical of the lowest points on these flat plains and are found on and adjacent to the proposed routes. This area is separated from the rest of the Great Plains physiographic province by the Canadian River, which runs east-west (Walker 1978). Elevations along the transmission lines range from approximately 3225 to 3322 feet above mean sea level.

The soils of the proposed project area lies within the Pullman Association, which is characterized by nearly level to gently sloping, deep soils that have a loamy surface layer and a firm clay subsoil (Jacquot et al. 1970). Covering approximately 72 percent of Randall County, the Pullman Association consists of smooth plains dotted with saucer shaped playas. Wind erosion potential is slight to moderate on the soils. Water erosion varies from slight to severe. The most erosive soils are the 1–3 percent slope Pullman clay loams.

2.3 Land Use

Except for the segments within the rights-of-way of county roads, the proposed routes are located on private lands in an area of intensive agriculture. These lands are used primarily for wheat, sorghum, and corn production.

2.4 Plant Communities

The native shortgrass and midgrass prairie communities (Gould 1979) in the proposed project area have largely been converted to croplands with non-agricultural plants being confined to roadside and undeveloped areas. Abandoned agricultural fields are dominated by weedy annual species such as mustards (*Descurainia* spp.), kochia (*Kochia prostrata*), horseweed (*Conyza* sp., bindweed (*Convovulus* sp.), silverleaf nightshade (*Solanum eleagnifolium*) and wild lettuce (*Lactuca* sp.). Playa areas are dominated by dock (*Rumex crispus*). Other species that commonly grow in the area include: bromes (*Bromus* spp.), tumblegrass (*Panicum virgatum*), western wheatgrass (*Agropyron smithii*), and Johnsongrass (*Sorghum halipensis*). A recently released Conservation Reserve Program area, dominated by a native grasses, is also located along the project route.

Common species found under established utility lines include pigweed and amaranth species (*Chenopodium* and *Amaranthus* spp.), bluegrass species (*Poa* spp.), hairy grama (*Bouteloua hirsuta*), blue grama (*Bouteloua gracilis*), Russian thistle (*Salsola kali*), fingergrass (*Chloris* sp), and sandbur species (*Cenchrus* spp.).

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3.0 Research Design and Methods

3.1 Project Research Design

Research domains for the region include chronology, subsistence, and settlement patterns. For the region as a whole, the most pressing needs include chronological control through absolute dating and the cultural/ temporal identification of sites that do not contain temporally sensitive projectile points or ceramics.

Subsistence issues include the need to identify post-Pleistocene adaptations that took place in the region: how food resources and modes of acquisition changed during the Paleoindian, Archaic, and Formative stages. One research need is to explore the range of diversity in, and change of, subsistence strategies.

Settlement issues concern the need to identify the fundamental parameters that govern human occupation for all prehistoric periods: degree of residential commitment, areal occupational intensity, range in the number of occupations, and variability in occupational duration. These parameters of settlement need to be investigated for each major prehistoric stage to specify changing settlement strategies.

The most fundamental need, however, is to locate, identify, and record prehistoric and historic sites. None of the research domains or issues can be addressed without more data.

3.2 Records Search

A site file search was conducted through the Texas Atlas, administered by the THC and the Texas Archeological Research Laboratory. No sites were found within 1.6 km (1.0 mile) of the project area. Additionally, there are no historic properties listed on the National Register of Historic Places or Texas State Archeological Landmarks recorded in the vicinity of the project area.

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4.0 Previous Investigations and Archaeological Background

4.1 Previous Investigations

Numerous investigations have been completed in the general vicinity of the project area. These investigations include surveys conducted by Jack Hughes of the Plains-Panhandle Museum, excavations at Lubbock Lake, the Justiceburg Reservoir project, Buffalo Lake Springs survey, and the South Bend survey, to name a few.

4.2 Cultural History

Although specific terms may differ, most archaeologists would agree on four fundamental cultural periods in Texas: Paleoindian, Archaic, Formative, and Historic. Overviews appropriate for this region include Boyd et al. (1989), Hofman et al. (1989), and Quigg et al. (1993). These syntheses outline major cultural developments in the region and provide the basis for the discussion that follows.

4.2.1 Paleoindian Period (ca. 9500–5500 B.C.)

The earliest evidence for humans on the southern Great Plains is material identified with the Paleoindian period. Hofman et al. (1989) uses the term "Early Specialized Hunters Adaptation Type" to describe the adaptive strategy characteristic of this stage. The Pleistocene-Holocene transition in climatic conditions occurred at this time. This transition was marked by a change from a somewhat cool period with little seasonal differentiation to one with a warmer, more seasonal differentiation. These changes also brought an overall reduction in the plant biomass, along with the demise of the mammoth, horse, and camel by 9000 B.C., and later the extinction of the giant bison (Johnson and Holliday 1995; Quigg et al. 1993). Campsites most frequently occur on hills, and kill/butchering locales are associated with playas or streams (Wendorf and Hester 1962; Johnson and Holliday 1995).

On the southern Great Plains, there are three distinct cultures of the Paleoindian period: Clovis, Folsom, and Plano. Clovis sites generally date from 9500–9000 B.C. Tool assemblages are characterized by fluted lanceolate (Clovis) spearpoints, blades, knives, scrapers, core choppers, and burins, which are frequently associated with mammoth and camel remains. In the Llano Estacado, Clovis sites include the Miami, the Blackwater Draw, the Yellow Hawk Site, and possibly the Lubbock Lake Site (Hester 1972; Johnson and Holliday 1995; Mallouf 1989; Sellards 1952). The Folsom culture (8800–8200 B.C.) is associated with distinctive fluted Folsom points and unfluted Midland points, knives, gravers, spokeshaves, pointed scrapers, cores, drills, burins, choppers, abrading stones, awls, and needles, often found in association with extinct bison, pronghorn, hare, fox, and turtle. In northern Texas, several investigated Folsom sites include Blackwater Draw Locality 1, Lipscomb, Lake Theo, Lubbock Lake, and the Adair Steadman sites (Hester 1972; Johnson and Holliday 1995; Schultz 1943; Tunnell 1975). The Plano culture (8200–5500 B.C.), on the southern plains, refers to late Paleoindian material not assignable to a specific Paleoindian complex (Hofman et al. 1989). It is characterized by point styles such as Plainview, Firstview, Milnesand, and Angostura on the southern plains, as well as Agate Basin, Hell Gap, Cody, Scottsbluff, and Frederick on the central and northern plains. The assemblages are relatively common and contain a range of scrapers, knives, and burins that are associated with an essentially modern faunal assemblage. Sites on the southern plains that are assigned to the Plano include San Jon, Plainview, and Lubbock Lake (Johnson and Holliday 1995).

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4.2.2 Archaic Period (ca. 5500 B.C.–A.D. 250)

Whereas Paleoindian subsistence is characterized as focused on large game, with the exploitation of a wide range of medium-sized animals, Archaic subsistence is described as having a more diversified economy reflecting a greater reliance on plant foods as well as large and small game (Judge 1982). One cause for this diversification is a climatic shift; the onset of the Altithermal led to a decrease in big game populations, causing humans to focus on smaller animals and plants closer to home. The Archaic stage has been divided into three periods. Early Archaic (5500–3000 B.C.) and Middle Archaic (3000–1000 B.C.) sites are uncommon in the area, whereas Late Archaic (1000 B.C.–A.D. 250) sites are better represented (Boyd et al. 1989; Quigg et al. 1993). Time frames for these periods differ from those used elsewhere in North America, particularly the Southeast and the Eastern Woodlands (Hofman et al. 1989).

The scarcity of Early Archaic sites suggests that the High Plains were depopulated during the Altithermal, but erosion of ground surfaces may be responsible for the paucity of archaeological data from this period. Prehistoric water wells at Mustang Springs, Sulphur Draw, Blackwater Draw, and Marks Beach indicate that innovative procedures were developed to utilize the High Plains during droughts (Evans 1951; Honea 1980; Meltzer and Collins 1991; Quigg et al 1994). Point styles, possibly indicative of the Early Archaic period, include some large, straight-stemmed indented or concave-based points (Bulverde, Gower, Martindale, and Pandale); large stemmed, straight base points (Nolan); and unstemmed points (Kinney and Pandora) (Boyd et al 1989; Quigg et al. 1993; Suhm and Jelks 1962). Excavations at the O.H. Ivie Reservoir along the Colorado River have revealed several Early Archaic components and have exposed the foundations of a house dating to 6600 B.C. (Lintz et al. 1995).

Middle Archaic sites (3000–1000 B.C.) in the region are also scarce and poorly preserved. They are best documented by collections of surface artifacts. Diagnostic artifacts include large dart points with weak to barbed shoulders and concave or indented base forms, bifaces, scrapers, gouges, drills, spokeshaves, awls, hammer stones, one-handed manos, and metates (Quigg et al. 1993). Middle Archaic sites in Texas are usually identified by the presence of Carrollton, Ellis, Kent, Marshall, Nolan, Palmillas, Pedernales, Trinity, and Williams points (Boyd et al 1989).

The Late Archaic is characterized by hunting and gathering by small groups. Late Archaic points show tremendous diversity in form. Points tend to have pronounced shoulder barbs (e.g., Marcos, Marshall, Shumla, and Williams) or relatively short points with broad but shallow side or corner notches (e.g., Ensor, Ellis, and Edgewood) (Boyd et al. 1989; Hughes 1976; Johnson and Holliday 1986; Suhm and Jelks 1962).

4.2.3 Late Prehistoric and Protohistoric Periods (A.D. 250–1800)

This period is characterized by ceramics and small arrow points even though these two traits were not introduced contemporaneously to the various regions. In addition, these traits were not uniformly adopted across the region. In the upper Texas Panhandle, pottery and points appear to be nearly 2,000 years old, whereas in north-central Texas, their earliest usage occurred 1,200 years ago. In addition, houses and even villages are commonly found in some areas but are scarce in others. Horticulture also was unevenly adopted across the region. Despite these differences, three subperiods have been identified and differentiated on the basis of ceramic types, projectile point forms, features, and subsistence practices (Quigg et al. 1993). These three are designated the Late Prehistoric I, the Late Prehistoric II, and the Protohistoric periods.

In the Panhandle region, two Late Prehistoric I (A.D. 250–1150) groups flourished contemporaneously throughout much of the first millennium A.D. Elsewhere, in north-central Texas, the Archaic technologies and adaptations persisted. North of the Canadian River, a series of sites with cordmarked pottery and small corner notched arrow points is assigned to the Lake Creek complex. This culture has affinities to the Woodland cultures to the north and east, although no Woodland houses have been identified in the

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region. South of the Canadian River, and along the eastern escarpment of the Llano Estacado, is a series of sites assigned to the Palo Duro Complex. This complex is probably closely related to the Washita River phase of western Oklahoma.

The Protohistoric period of A.D. 1450–1700 is marked by significant changes throughout the region. The upper Panhandle region is abandoned by sedentary groups, perhaps ahead of the advancement of the Apachean groups. Farther south of the Canadian River, a series of sites reflect interaction with tremendous trade networks that linked the Southwestern Puebloans and the Caddoans. Several of these sites have fortified palisades. Three complexes in the lower Panhandle and western Oklahoma region include the Tierra Blanca, Garza, and the Wheeler/Little Deer complexes (Boyd 1997).

Researchers have attempted to link these archaeological complexes to named groups in the early Spanish records and to modern Indians. Thus, from Coronado's journal, the Querecho often are linked to Apaches in the northern Panhandle, and the Teyas are linked to the Caddoans further south. The Querecho, a name of Puebloan origin referring to buffalo hunters cannot, with certainty, be associated with any historic tribe. The Querecho probably were an eastern Apachean group, and they may be ancestors of the Jicarillas, Lipans, and Kiowa (Newcomb 1990).

4.2.4 Historic Period (A.D. 1800–Present)

Historically known native groups occupying the portions of north Texas include the Kiowa Apaches, Apaches, and Comanches. Conflict between these groups and Anglos inhibited travel across the region until the late nineteenth century (Quigg et al. 1993). Conclusion of the Red River War in the 1870s opened the area to Anglo settlement and railroads reached the Texas Panhandle in 1887–1888.

The founding of Amarillo was directly the result of the coming of the railroad. The town was platted and voted county seat in 1887. The town became the center of the regional cattle trade. The town center was moved a mile from the west to its present location in 1890 due to flooding. The railroad continued to have a major impact on the town's development and became a major hub for several lines. By 1900, the population had reached 9,957. Gas was discovered in 1918 and oil three years later. Soon after, the region added a zinc smelter, oil refineries, and oil-shipping facilities.

The dustbowl of the 1930s seriously hindered economic and demographic growth, but the city was a regional center for numerous federal relief programs, especially the Work Projects Administration whose funds helped improve Amarillo streets, water, and sewerage facilities. By 1940 Amarillo's population numbered 51,686 (Handbook of Texas 2001).

5.0 Methods of Field Investigations

5.1 Field Methods

In the absence of a staked right-of-way centerline, the survey was conducted along fence lines, roads, and existing transmission lines identified by Mr. Sean Frederiksen, Right-of-Way Agent for SPS in Amarillo. A pedestrian survey was conducted with parallel, non-overlapping, and linear transects spaced no more than 15 m (50 feet) apart. The survey was conducted under good weather and lighting conditions. The surface visibility was good to poor depending on the crops growing in the fields, their maturity, playa water levels, and urban development. In fields it was possible to see much of the ground surface by examining between the crop rows or in the bare strip along the edge of the field. The areas around fields were checked for possible cultural resources.

Consistent with Council of Texas Archeologists Guidelines, shovel tests were placed in those landscape positions where surface artifacts may be difficult to detect or where the potential for discovery of subsurface artifacts was reasonably high. Six 30 x 30 cm shovel tests were excavated along the proposed right-of-way in areas covered with dense grass and with some potential for buried cultural deposits, particularly near the playas. The shovel tests were terminated upon reaching caliche or at a dark brown clay-loam, which could not be penetrated by a shovel. No buried cultural materials or deposits were found in the shovel tests.

Much of the routes has been machine-leveled to enhance gravity irrigation and has been plowed for many years. This massive disturbance to the surface and subsurface as well as the lack of permanent water sources (other than the playas), the lack of lithic procurement sources, and the lack of prominent landforms or sand dunes suggest a limited potential for significant cultural resources along the right-of-way. This limited potential was confirmed by the lack of cultural materials in the shovel tests, in the eroded playa edge, and elsewhere along the right-of-way.

5.2 Field Results

Two isolated occurrences were found during the survey. Table 5.1 lists the isolated occurrences and their location. The isolated occurrences were thoroughly recorded and no additional work is recommended.

Table 5.1 Isolated Occurrences

IO No.	Description	UTM Zone 14	
		Northing	Easting
1	1 piece of sun-colored amethyst glass	3886699	233853
2	1 chert cortical core flake, 2-4 cm in size	3887251	235500

5.3 Shovel Tests

Table 5.2 Shovel Tests along Segments

ST No.	Depth (cm bgs)	Description of Sediments	Results	Segment	UTMs (Zone 14)
1	0-30	Soft, dark brown clay; roots	Negative	4	233019E, 3888114N
2	0-30	Soft, dark brown clay; roots	Negative	4	233183E, 3888109N
3	0-30	Soft, dark brown clay; roots	Negative	5	235518E, 3888029N
4	0-27	Compact, brown clay	Negative	5	235485E, 3886366N

ST No.	Depth (cm bgs)	Description of Sediments	Results	Segment	UTMs (Zone 14)
5	0-30	Compact, brown clay; roots, caliche	Negative	5	234388E, 3884722N
6	0-28	Compact, brown loam, some roots	Negative	4	232211E, 3882414N

6.0 Recommendations

Between September 11 and 12, 2006, TRC performed a cultural resource survey for SPS, along potential segments of a proposed transmission line and substation south of Amarillo, Randall County, Texas. The investigations included a record search and an intensive, 100-percent-coverage pedestrian survey of the segments.

Two isolated occurrences were found and recorded during the survey. Both isolated occurrences were fully recorded and no additional information can be obtained. Therefore, no additional investigations are recommended. Clearance is recommended for the project. If any cultural remains are uncovered during construction of the transmission line or substation, it is recommended that the THC archaeologist be notified.

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7.0 References Cited

Boyd, D.
1997 *Caprock Canyons Archaeology: A Synthesis of the Late Prehistory and History of Lake Alan Henry and the Texas-Panhandle-Plains*. Prewitt and Associates, Reports of Investigations 110, Austin.

Boyd, D., M. D. Freeman, M. Blum, E. Prewitt, and J. M. Quigg
1989 Phase I Cultural Resources Investigations at Justiceburg Reservoir on the Double Mountain Fork of the Brazos River, Garza and Kent Counties, Texas. Prewitt and Associates, Austin.

Evans, G.
1951 Prehistoric Water Wells of Eastern New Mexico. *American Antiquity* 17(1): 1-9.

Gould, F. W.
1979 Texas Plants–A Checklist and Ecological Summary. In *Manual of Vascular Plants of Texas.* University of Texas at Dallas.

Handbook of Texas
2001 Website at http://www.tsha.utexas.edu/handbook/online/articles/view/AA/hda2.html. Copyright, The Texas State Historical Association, 1997-2001.

Hester, J.
1972 *Blackwater Draw Locality 1: A Stratified Early Man Site in Eastern New Mexico*. Publication of the Ft. Burgin Research Center No. 8, Southern Methodist University, Dallas.

Hofman, J., R. Brooks, J. S. Hays, D. Owsley, R. Jantz, M. Marks, and M. Manheim
1989 *From Clovis to Comanchero: Archaeological Overview of the Southern Great Plains.* Arkansas Archaeological Survey Research Series 35, Fayetteville.

Honea, K.
1980 *The Marks Beach Site, A Stratified PaleoIndian Site, Lamb County, Texas.* Bulletin of the Texas Archaeological Society 51: 243-269.

Hughes, J.
1976 The Panhandle Archaic. In *The Texas Archaic*, edited by T. R. Hester. Center for Archaeological Research, Special Report 2, University of Texas, San Antonio.

Jacquot, L., L. Geiger, B. Chance, and W. Tripp
1970 *Soil Survey of Randall County, Texas.* Soil Conservation Service and Texas Agricultural Experiment Station, U.S. Government Printing Office, Washington, D.C.

Johnson, E., and V. T. Holliday
1986 The Archaic Record at Lubbock lake. In *Current Trends in Southern Plains Archaeology*, edited by T. Baugh, pp. 7-54. Plains Anthropologist Memoir 21.

1995 *Archaeology and Late Quaternary Environments on the Southern High Plains.* Bulletin of the Texas Archaeological Society, Vol. 66: 519-540.

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Judge, W. J.
1982 The Paleo-Indian and Basketmaker Periods: An Overview and Some Research Problems. In *The San Juan Tomorrow: Planning for Conservation of Cultural Resources in the San Juan Basin*, edited by F. Plog and W. Wait, pp. 5-57. National Park Service, Southwest Region, Santa Fe.

Lintz, C., A. C. Treece, and F. Oglesby
1995 The Early Archaic Structure at the Turkey Bend Ranch Site (41CC112), Concho County. In *Advances in Texas Archaeology: Contributions from Cultural Resource Management*, edited by J. Bruseth, and T. Perttula, pp. 155-185. Texas Historical Commission Cultural Resource Management Report 5.

Mallouf, R. J.
1989 A Clovis Workshop in the Callahan Divide: The Yellow Hawk Site, Taylor County, Texas. *Plains Anthropologist* 34: 81-103.

Meltzer, D., and M. B. Collins
1991 Prehistoric Water Wells of the Southern High Plains: Clues to Altithermal Climate. *Journal of Field Archaeology* 14: 9-28.

Newcomb, W. W.
1990 Indians of Texas From Prehistoric to Modern Times. University of Texas Press, Austin.

NOAA
2006 National Oceanic and Atmospheric Association – Western Regional Climate Center Database. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?tx5411.

Owenby, J.R. and D.S. Ezell
1992 *Monthly Station Normals of Temperature, Precipitation, and Heating and Cooling Degree Days, 1961-90, Texas.* U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Climatic Data Center, Asheville, North Carolina.

Quigg, J. M., C. Frederick, and C. Lintz
1994 *Sulphur Spring Draw: Geoarchaeological and Archaeological Investigations at Sulphur Draw Reservoir, Martin County, Texas.* Mariah Associates Inc., Technical Report 776, Austin.

Quigg, J. M., C. Lintz, F. Oglesby, A. C. Earls, C. Frederick, W. N. Trierweiler, D. Owsley, and K. Kibbler
1993 *Historic and Prehistoric Data Recovery at Palo Duro Reservoir Hansford County, Texas.* Mariah Associates Inc., Technical Report 485, Austin.

Schultz, C. B.
1943 Some Artifact Sites of Early Man in the Great Plains and Adjacent Areas. *American Antiquity* 8: 242-249.

Sellards, E. H.
1952 *Early Man in America.* University of Texas Press, Austin.

Suhm, D. A. and E. Jelks
1962 *Handbook of Texas Archaeology: Type Descriptions.* Jointly Published by the Texas Archeological Society and the Texas Memorial Museum, Austin.

Tunnell, C.
1975 *Fluted Projectile Point Production as Revealed by Lithic Specimens from the Adair-Steadman Site in Northwest Texas*. Office of the State Archeologist, Texas Historical Commission Special Report 18, Austin.

Walker, J.R.
1978 *Geomorphic Evolution of the Southern High Plains*. Baylor University, Department of Geology, Waco, Texas.

Wendorf, F., and J. Hester
1962 Early Man's Utilization of the Great Plains Environment. *American Antiquity* 28: 159-171.

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BIOLOGICAL EVALUATION OF THE PROPOSED AMARILLO SOUTH INTERCHANGE TO SPRING DRAW SUBSTATION 115kV TRANSMISSION LINE IN RANDALL COUNTY, TEXAS

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BIOLOGICAL EVALUATION OF THE PROPOSED AMARILLO SOUTH INTERCHANGE TO SPRING DRAW SUBSTATION 115kV TRANSMISSION LINE IN RANDALL COUNTY, TEXAS

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Amarillo, Texas

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TRC Project 54316

TRC Report No. 54316-B-01

November 2006

Summary

Southwestern Public Service Company (SPS) proposes to construct a new substation and 115kV single-pole electric transmission line and substation south-southwest of Amarillo, Texas. The proposed substation, Spring Draw Substation, will be constructed west of Interstate 27 and south of FM 2219. The preferred route, Route 1, consists of Segments A and B, while the five alternate routes include a combination of Segments B, C, D, E, F, G, H, I J, K, and L.

A survey corridor was established along each of the preferred and alternate transmission routes and the site for the proposed substation. This area was surveyed for biological resources by Mike Balistrieri, TRC Biologist, from September 4-5, 2006 at the request of SPS, Amarillo, Texas. The proposed project lies on private land and consultation with the U.S. Fish and Wildlife Service and the Texas Parks and Wildlife Department is not required. However, since the work will involve ground-disturbing activities, SPS authorized the study to identify and the presence or absence of natural and biological resources. This Biological Evaluation addresses the potential impacts to Threatened, Endangered, or Sensitive (TES) plant and wildlife species, as well as biologically sensitive habitats associated with the proposed action.

Based on a review of the US Fish and Wildlife Service and the Texas Parks and Wildlife Division databases, no Threatened or Endangered plant species are known to occur in Randall County. One State Sensitive species, the three-tongue spurge (*Chamaesyce chaetocalyx*), may occur in the county. Twenty TES wildlife species are known to, or may potentially occur, in the county. However, based on the results of the survey, the proposed project area does not contain suitable nesting, denning, or roosting habitat for any of these species. None of the wildlife species were observed during the field survey.

The primary potential negative impacts to the biotic environment from the proposed action stem from the destruction or alteration of vegetation within the proposed project area. No significant impacts to unique biological resources are expected to result from the proposed project. Recommended impact avoidance and minimization measures are presented for each of the potentially sensitive biological resources.

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1.0 Introduction

Southwestern Public Service Company (SPS) proposes to install approximately 5.5 miles of new single-pole, 115kV electric transmission line while utilizing approximately 2.4 miles of an existing single circuit 115kV electric transmission line previously constructed to accommodate two 115kV circuits in an area eight miles south-southwest of Amarillo Texas. The proposed project route and five alternative routes were surveyed in early September. This Biological Evaluation summarizes the results of that survey and identifies the potential impacts to Threatened, Endangered, and Sensitive (TES) plant and wildlife species, as well as to biologically sensitive habitats that may be associated with the proposed action. The report also presents recommendations for minimizing negative impacts to these sensitive resources.

1.1 Project Location

The project area is located in the center of the South Plains or Llano Estacado of Randall County, approximately 8 miles (12.9km) south-southwest of Amarillo, Texas (Figure 1.1). The project area is located entirely on private lands. The project is located on the Buffalo Stadium (1960) United States Geological Survey (USGS) 7.5 minute quadrangle map. The proposed Spring Draw substation is at the Universal Transverse Mercator (UTM) coordinates (Zone 14): 233229E, 3882355N. Segment lengths are Segment A: 4.62 miles, Segment B: 0.79 miles, Segment C: 0.26 miles, Segment D: 2.99 miles, Segment E: 2.31 miles, Segment F: 1.14 miles, Segment G: 0.19 miles, Segment H: 0.87 miles, Segment I: 0.94 miles, Segment J: 0.95 miles, Segment K: 1.00 mile, Segment L 1.30 miles. The total length is 17.36 miles with 10.8 miles not thoroughly surveyed. Width surveyed was 100 feet (30.5 m). Total acreage is approximately 210 acres (84.98 ha).

1.2 Project Description

The preferred route is comprised of Segments A and B, while the alternate routes include a combination of Segments B, C, D, E, F, G, H, I, J, K, and L. Segment A begins 0.26 miles north of Sundown Lane and 0.6 miles east of I-27 and goes south for approximately 1.8 miles, turns west approximately 0.25 miles, south approximately 0.27 miles, and west approximately 0.37 miles. Segment A then turns south for approximately 0.5 miles, then east approximately 0.13 miles, south approximately 0.75 miles to Lair Road, then west approximately 0.55 miles along Lair Road to the west side of I-27 and the north terminus of Segment B. Segment B starts at I-27 and FM 2219, the end of Segment A, and goes south along the west frontage road approximately 0.5 miles and then turns west to connect to the new Spring Draw Substation site for a total segment length of 0.79 miles. Segment C. is approximately 0.26 miles and extends from the existing Circuit V-44 south along Coulter Road to Sundown Lane. Segment D begins at Coulter Road and Sundown Lane and goes west along Sundown Lane approximately 1.0 mile to FM 2590 then turns south along FM 2590 for approximately 1.99 miles. Segment E begins at the south terminus of Segment D and continues south along FM 2590 for approximately 1.66 miles then turns east for approximately 0.65 miles to connect to the new Spring Draw Substation site. Segment F goes south from Circuit V-44 for approximately 1.14 miles along the west frontage road of I-27. Segment G begins at the terminus of Segment F and goes west approximately 0.19 miles, from the I-27 frontage road to Coulter Road. Segment H starts at the intersection of Sundown Lane and Coulter Road and goes south along Coulter Road approximately 0.87 miles to the terminus of Segment G. Segment I goes south from the intersection of Segments G and H and continues south along Coulter Road approximately 0.94 miles to Longoria Road. Segment J goes south along the west frontage road of I-27 from the intersection of Segments F and G for approximately 0.95 miles to Longoria Road and the south terminus of Segment I. Segment K begins at the intersection of Segments I and J extends west along Longoria Road for approximately 1.0 mile to FM 2590. Segment L is approximately 1.30 miles and starts at the intersection of Segments I, J and L and extends south along the west frontage road of I-27 to the intersection of Segments A, B, and K.

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Figure 1.2 Segment A at the intersection with McCormick Road looking south

Figure 1.3 Segment B at intersection with FM 2219 and Lair Rd lkg S I-27 parallels this segment

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Figure 1.4 Segment C looking north from intersection with FM 2590 and Segment H

Figure 1.5 Segment D looking south along FM 2590 from intersection with Costley Road

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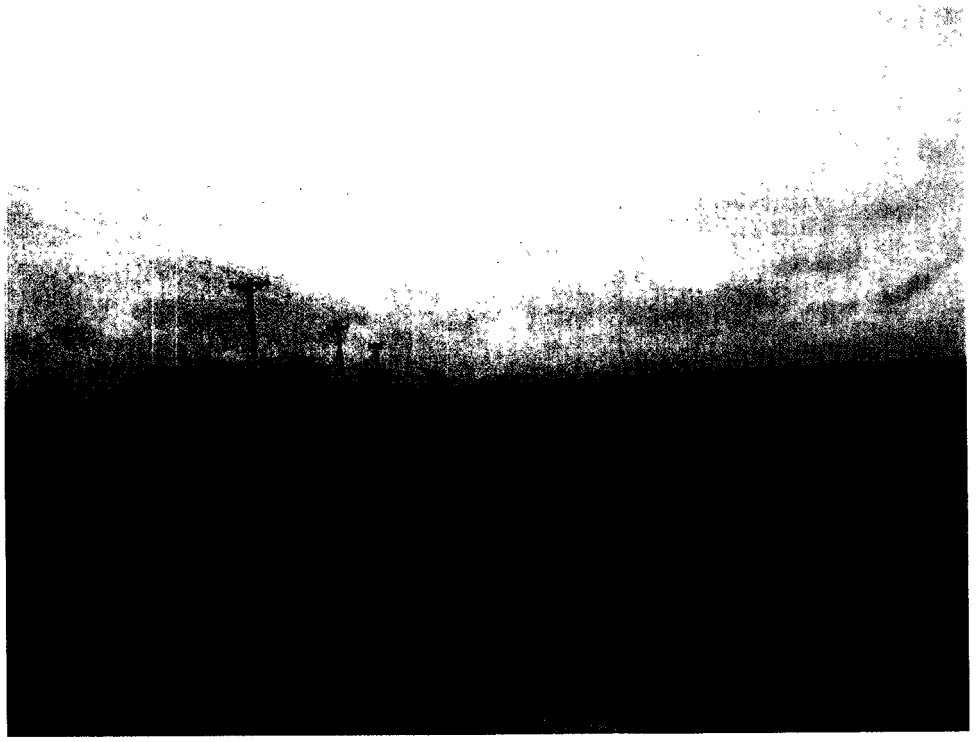

Figure 1.6 Segment D looking west from intersections with Segments H and C

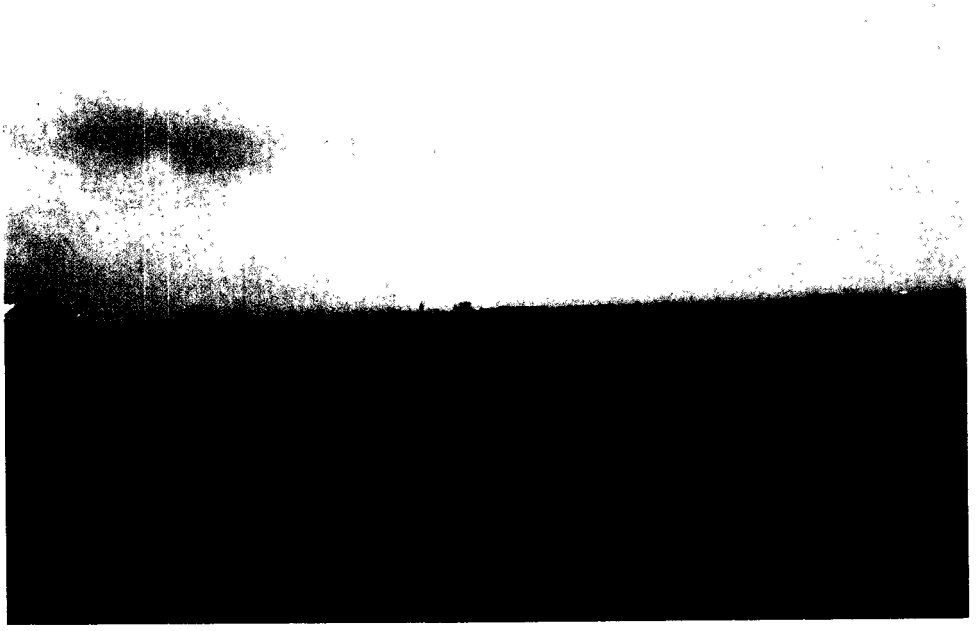

Figure 1.7 Segment F along west right-of-way of Interstate 27 looking south

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Figure 1.8 Segment H looking north of Segment G

Figure 1.9 Segment I along Coulter Rd looking north

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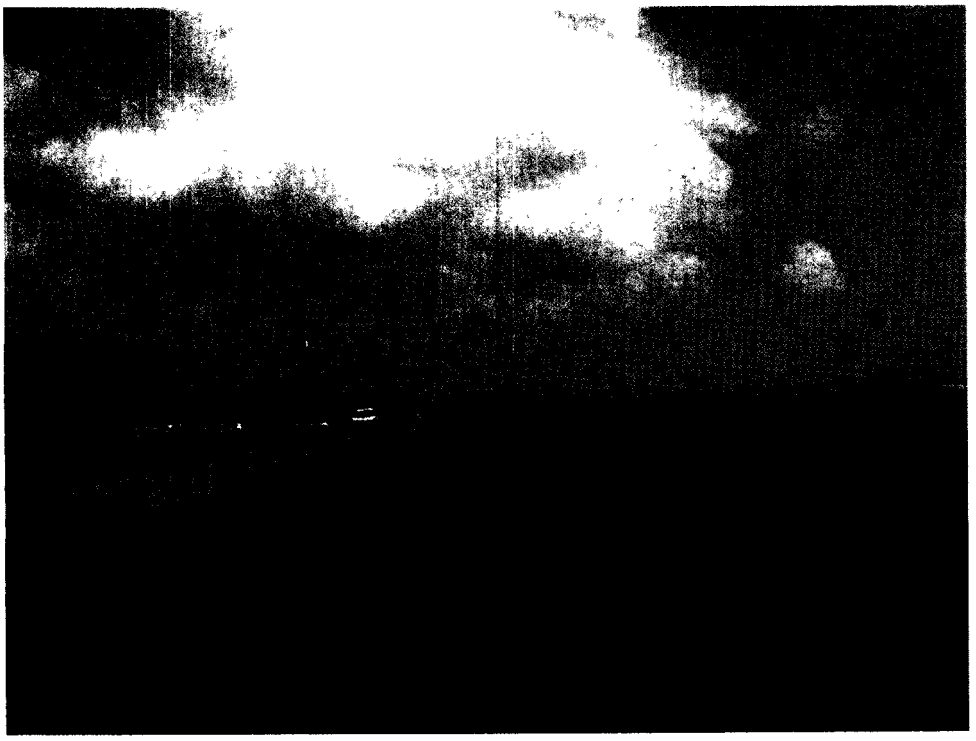

Figure 1.10 Segment K looking west along Longoria Road, from Raymond Drive

2.0 Methods

A complete literature search was conducted to construct a list of all TES plant and animal species known to occur, or having the potential to occur, in Randall County. The special status of individual species was based on lists and databases maintained by the U.S. Fish and Wildlife Service (USFWS 2006), the Texas Parks and Wildlife Department (TPWD 2006), and the Nature Conservancy (2006). Unique or special habitat requirements for each of the target species were also evaluated in constructing a working list of species that might occur in the general project area.

The on-site component of this study focused on a field survey of the proposed routes and the surrounding area. The presence of or the potential for occurrence of TES plant, unique plant habitats and animal species was noted during the survey. A general evaluation of the area included vegetation health, composition, stature, and the characteristics and levels of previous disturbances. Potential nesting or burrowing sites were also examined for the presence of wildlife. The field survey was conducted by Mike Balistrieri, TRC Biologist, on September 4 and 5, 2006.

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3.0 Environmental Setting

3.1 Climate

The nearest climate station to the proposed project route is at the Amarillo International Airport, approximately 16.4 miles (26.4 kilometers) northeast of the project area center point. Data for this station show an average annual temperature range of 43.7–70.7°F (6.50–21.5°C), with a mean annual temperature of 57.2°F (14.0°C). Average annual precipitation is approximately 19.7 inches (50.0 centimeters) with most of the precipitation occurring as summer thunderstorms from May to October (Owenby and Ezell 1992). The airport station receives an average of 15.2 inches (38.6 centimeters) of snowfall each year (NOAA 2006).

3.2 Topography and Soils

The proposed project area lies in the center of the South Plains of the Southern High Plains or Llano Estacado (Handbook of Texas 2006). The region is characterized by low, rolling hills separated by flat-to-gently-sloping alluvial plains. Playas, or seasonally inundated lake basins, are typical of the lowest points on these flat plains and are found on and adjacent to the proposed routes. This area is separated from the rest of the Great Plains physiographic province by the Canadian River, which runs east-west (Walker 1978). Elevations along the transmission lines range from approximately 3225 to 3322 feet (982 to 1012 meters).

The soils of the proposed project area lies within the Pullman Association, which is characterized by nearly level to gently sloping, deep soils that have a loamy surface layer and a firm clay subsoil (Jacquot et al. 1970). Covering approximately 72 percent of Randall County, the Pullman Association consists of smooth plains dotted with saucer shaped playas. Wind erosion potential is slight to moderate on the soils. Water erosion varies from slight to severe. The most erosive soils are the 1–3 percent slope Pullman clay loams.

3.3 Land Use

Except for the segments within the rights-of-way of county roads, the proposed routes are located on private lands in an area of intensive agriculture. These lands are used primarily for wheat, sorghum, and corn production.

3.4 Plant Communities

The native shortgrass and midgrass prairie communities (Gould 1979) in the proposed project area have largely been converted to croplands with non-agricultural plants being confined to roadside and undeveloped areas. Abandoned agricultural fields are dominated by weedy annual species such as mustards (*Descurainia* spp.), kochia (*Kochia prostrata*), horseweed (*Conyza* sp., bindweed (*Convovulus* sp.), silverleaf nightshade (*Solanum eleagnifolium*) and wild lettuce (*Lactuca* sp.). Playa areas are dominated by dock (*Rumex crispus*). Other species that commonly grow in the area include: bromes (*Bromus* spp.), tumblegrass (*Panicum virgatum*), western wheatgrass (*Agropyron smithii*), and Johnsongrass (*Sorghum halipensis*). A recently released Conservation Reserve Program area, dominated by native grasses, is also located along the project route.

Common species found under established utility lines include pigweed and amaranth species (*Chenopodium* and *Amaranthus* spp.), bluegrass species (*Poa* spp.), hairy grama (*Bouteloua hirsuta*), blue grama (*Bouteloua gracilis*), Russian thistle (*Salsola kali*), fingergrass (*Chloris* sp), and sandbur species (*Cenchrus* spp.).

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4.0 Target Resources and Findings

4.1 Threatened, Endangered, and Sensitive Plants

Threatened and Endangered plants are protected according to the laws and regulations set forth in Chapter 88 of the Texas Parks and Wildlife Code (TPWC) and §69.01-69.14 of the Texas Administrative Code (TAC). Plant species listed as Endangered or Threatened by USFWS are protected under the Federal Endangered Species Act of 1973 (ESA).

No Threatened or Endangered plant species are recognized by either the USFWS or TPWD (TNC 2004) as occurring in Randall County, Texas. One State Sensitive species, the three-tongue spurge (*Chamaesyce chaetocalyx* var. *triligulata*), may occur in Randall County. This low-statured, perennial forb is not specifically legally protected and was not observed along the project routes. However, its distribution and populations are monitored closely by state and federal management agencies.

4.2 Threatened, Endangered, and Sensitive Wildlife

Threatened and Endangered wildlife species are protected according to the laws and regulations set forth in Chapters 67–68 of the TPWC and §65.17-65.184 of Title 31 of the TAC. Wildlife species listed as Endangered or Threatened by USFWS are protected under the Federal ESA. Sensitive species are not specifically legally protected. However, populations and distributions of these potentially at-risk species are monitored closely by state and federal management agencies.

A list of the 20 TES wildlife species of known or potential occurrence in Randall County is presented in Table 4.1. Again, none of these species were encountered during the field survey.

Table 4.1 Threatened, Endangered, or Sensitive wildlife species of known or potential occurrence in Randall County, Texas (TPWD 2006, USFWS 2006)

Common Name *Scientific Name*	Habitat	Potential for Occurrence	Status
[illegible]			
[illegible]			
[illegible]			
Texas horned lizard *Phrynosoma cornutum*	Open semi-arid and arid areas with sparse vegetation	None – Proposed project area does not contain suitable habitat	t
[illegible]			
Baird's sparrow *Ammodramus bairdii*	Winters in prairie and grassland areas	None – Proposed project area does not contain suitable habitat	s
Western burrowing owl *Athene cunicularia hypugaea*	Grasslands and scrub with sparse cover	None – Proposed project area does not contain suitable habitat	s
Ferruginous hawk *Buteo regalis*	Open plains and prairies, often near water	None – May hunt in area, but no nest sites in the vicinity	s
Snowy plover *Charadrius alexandrinus*	Sand margins, beaches, dry mud and alkali flats	None – Proposed project area does not contain suitable habitat	s
Mountain plover *Charadrius montanus*	Semiarid grasslands and plains, sage scrub	None – Proposed project area does not contain suitable habitat	s
Prairie falcon *Falco mexicanus*	Open plains, prairies, mountainous areas	None – May hunt in area, but no nest sites in the vicinity	s
American peregrine falcon *Falco peregrinus anatum*	Open country, cliffs, and steep canyons	None – Proposed project area does not contain suitable habitat	e

Common Name *Scientific Name*	Habitat	Potential for Occurrence	Status
Arctic peregrine falcon *Falco peregrinus tundrius*	Winters in forests, limited scrub use in migration	None – Proposed project area does not contain suitable habitat	t
Whooping crane *Grus americana*	Marshes, prairie potholes, wetlands	None – May occasionally feed in area during migration.	E e
Bald eagle *Haliaeetus leucocephalus*	Winters along shores of rivers and lakes	None – Proposed project area does not contain suitable habitat	T t
Mammals			
Grey wolf *Canis lupus*	Brushlands, grasslands, wooded area	None – Proposed project area does not contain suitable habitat	E e
Black-tailed prairie dog *Cynomys ludovicianus*	Great Plains grasslands, grassy meadows	None – Proposed project area does not contain suitable habitat	s
Black-footed ferret *Mustela nigripes*	Associated with large prairie dog towns	None – Proposed project area does not contain suitable habitat	E e
Cave myotis *Myotis velifer*	Varied - associated with mines and caves	None – Proposed project area does not contain suitable habitat	s
Big free-tailed bat *Nyctinomops macrotis*	Varied – typically higher-elevation crevices	None – Proposed project area does not contain suitable habitat	s
Townsend's big-eared bat *Plecotus townsendii*	Varied - associated with mines , caves, buildings	None – Proposed project area does not contain suitable habitat	s
Palo Duro mouse *Peromyscus truei*	Rocky, juniper-mesquite slopes of steep canyons	None – Proposed project area does not contain suitable habitat	T
Plains spotted skunk *Spilogale putorius*	Agricultural areas, prairies, woods, brushy areas	None – Proposed project area does not contain suitable habitat	s
Swift fox *Vulpes velox*	Grasslands and scrub, west and north Panhandle	None – Proposed project area does not contain suitable habitat	s

E= Federal Endangered; **T** = Federal Threatened; **e** = State of TX Endangered; **t** = State of TX Threatened; **s**: State of TX Sensitive

4.3 Migratory Birds

The field survey was conducted during the active season for most of the local bird species. Existing transmission structures were examined for any signs of past or current nesting activities. No old or new nests were found along the routes or on any of the existing transmission structures. Within the preferred and alternative project routes, there appears to be only one or two trees that may be affected by the proposed action. However, non-tilled portions of the proposed routes may contain current or future nest sites for ground-nesting species.

4.4 Jurisdictional Waterways

As defined in §328.3 (a)(3) of 33 CFR 328, intermittent streams and drainages that ultimately flow into an interstate waterway are considered jurisdictional waterways. Impacts to these waterways are restricted under Section 404 of the Clean Water Act. Relatively minor direct impacts to surface waterways, such as modifications to arroyos and drainages, are regulated under the Nationwide Permit system administered by the U.S. Army Corps of Engineers (USACE). No jurisdictional waterways will be dredged or filled under the proposed action.

5.0 Recommendations

5.1 Plant Communities

To minimize vegetation losses and soil disruptions, construction vehicle traffic should be limited to only those areas that are specifically needed to complete the proposed actions. Where possible, removal of trees or shrubs should be avoided. Care should also be taken to replace and redistribute the seed-bearing topsoil following construction, as applicable. The vegetative regrowth may be expedited by stabilizing the replaced topsoil with an organic mulch such as a native grass hay and by seeding with an approved native seed mixture.

5.2 Threatened, Endangered, and Sensitive Plants

No Threatened or Endangered plant species are known to occur in Randall County. One State Sensitive species, the three-tongue spurge (*Chamaesyce chaetocalyx* var. *triangulata*) has been recorded for Randall County. While it is unlikely that this species will occur in the project area, care should be taken to avoid grading and disturbing large areas of ground.

5.3 Threatened, Endangered, and Sensitive Wildlife

Because the project corridor is located in previously disturbed and existing rights-of-way, or is adjacent to developed croplands, the likelihood of any of TES wildlife species to occur within the proposed project area is low. However, given the mobility and seasonal behavior of wildlife, it is possible that some of these species may be present in the proposed project area just prior to, or during, construction activities. If so, their presence is likely to be transitory and the proposed actions should not have any significant impacts on them.

5.4 Migratory Birds

The Migratory Bird Treaty Act of 1918 provides for the protection of migratory birds from harassment, harm, or harvest. The primary concern associated with the proposed project area is the removal or alteration of nesting and roosting sites that may threaten the integrity of avian communities. The removal or severe alteration of any vegetation within the proposed project area may result in a loss of current or potential nest and roost sites. Avoidance measures should be implemented to protect nesting migratory birds from potentially negative impacts. If possible, all surface disruptions should be scheduled before April 1 or after August 15 to avoid the nesting season. If nesting migratory birds are found in the area of impact, resource management agencies should coordinate efforts to determine the most suitable measures to prevent harming the birds. The contractor should contact the Ecological Services Division of the USFWS at 512-490-0057 or the TPWD at 806-665-3494.

5.5 Other Wildlife Species

5.5.1 Invertebrates

Localized disturbances to some arthropod communities are likely and will result in varying degrees of mortality. This effect may be significant among the burrowing and terrestrial species. Vegetation removal will decrease food, shelter, and nest sites for many individuals. To conserve arthropod communities, it is suggested that disturbances to the plants and soils within the proposed project area be kept to a minimum.

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5.5.2 Amphibians and Reptiles

Some amphibian or reptile den sites and burrows, as well as other shelter areas, may be destroyed during the proposed action. Displaced individuals will be forced to compete with neighboring individuals of the same species, and this may lead to some additional mortality. This consequence may be minimal if existing populations are currently below the maximum number of individuals that can be supported by the resources in the area. Scheduling activities during the warmer months will help to minimize the negative impacts on hibernating amphibian and reptile populations. During the spring and summer, these animals achieve the best success in dispersing and establishing new territories. If hibernating individuals are encountered during construction in the fall and winter months, care should be taken to move them away from the project area and to bury them at the same depth at which they were uncovered.

5.5.3 Mammals

The proposed actions will undoubtedly destroy some small mammal burrows and may result in some mortality, as the majority of burrowing mammals are nocturnal and occupy these burrows during the daytime. Care should be taken to avoid unnecessary damage to existing burrows in the project right of way. If possible, major ground disturbances such as trenching and deep excavation should be scheduled during the warmer months to avoid impacts to hibernating individuals. Additionally, damage to existing vegetation, which is a source of food and shelter for most of the area's mammals, should be minimized. Similarly, removal of trees and shrubs should be avoided where possible, as these provide valuable cover and canopy.

5.6 Jurisdictional Waterways

If any alteration of jurisdictional waterways should become necessary under the proposed action, an individual Section 404 Permit application should be developed and submitted to the USACE.

6.0 Literature Cited

Gould, F. W.
1979 Texas Plants—A Checklist and Ecological Summary. In *Manual of Vascular Plants of Texas.* University of Texas at Dallas.

Handbook of Texas
2001 Website at http://www.tsha.utexas.edu/handbook/online/articles/view/AA/hda2.html. Copyright©, The Texas State Historical Association, 1997-2001.

Jacquot, L., L. Geiger, B. Chance, and W. Tripp
1970 *Soil Survey of Randall County, Texas.* Soil Conservation Service and Texas Agricultural Experiment Station, U.S. Government Printing Office, Washington, D.C.

NOAA
2006 National Oceanic and Atmospheric Association – Western Regional Climate Center Database. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?tx5411.

Owenby, J.R. and D.S. Ezell
1992 *Monthly Station Normals of Temperature, Precipitation, and Heating and Cooling Degree Days, 1961-90, Texas.* U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Climatic Data Center, Asheville, North Carolina.

TNC
2004 The Nature Conservancy Conservation Data Center, Rare Plants of Texas. http://www.nature.org/wherewework/northamerica/states/texas/files/listofrareplants.pdf

TPWD
2006 Texas Department of Parks and Wildlife, Rare, Threatened, and Endangered Species of Texas. http://gis.tpwd.state.tx.us/TpwEndangeredSpecies/DesktopDefault.aspx

University of Texas at Austin, Bureau of Economic Geology
1968 *Geologic Atlas of Texas, Plainview Sheet.* Army Map Service, U.S. Army Corps of Engineers, Washington, D.C.

1969 *Geologic Atlas of Texas, Amarillo Sheet.* Army Map Service, U.S. Army Corps of Engineers, Washington, D.C.

USFWS (US Fish and Wildlife Service)
2006 Endangered Species List. http://www.fws.gov/ifw2es/EndangeredSpecies/lists/ListSpecies.cfm

Walker, J.R.
1978 *Geomorphic Evolution of the Southern High Plains.* Baylor University, Department of Geology, Waco, Texas.

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