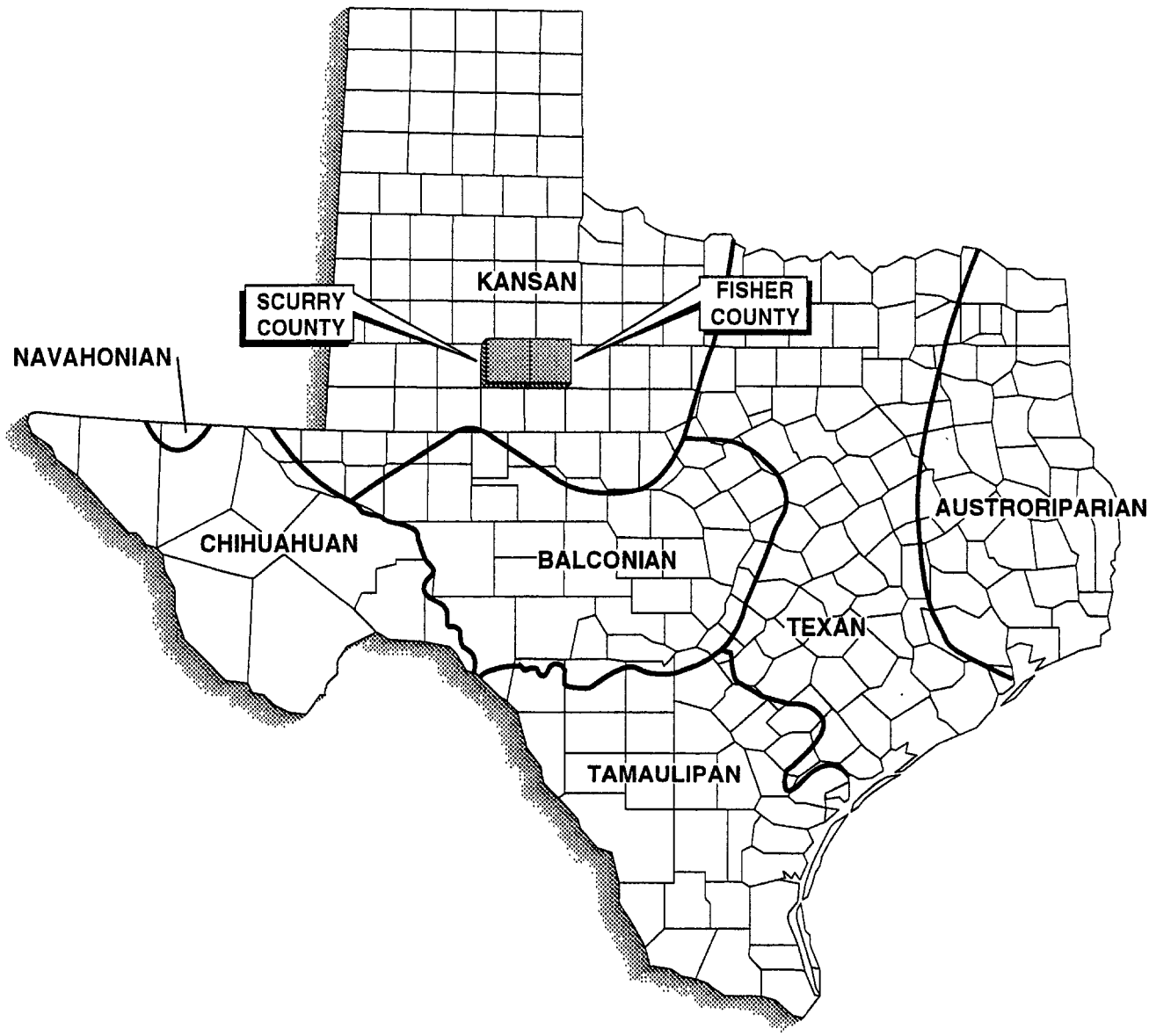
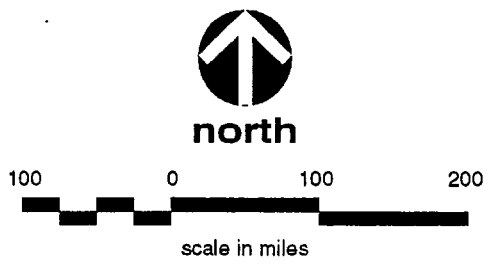




Source: Blair, 1950

Espey, Huston & Associates, Inc.
Engineering & Environmental Consultants

Figure 3-4

LOCATION OF
FISHER AND SCURRY COUNTIES
IN RELATION TO THE
BIOTIC PROVINCES OF TEXAS

inhabitants will, instead, be species adapted to rapid dispersal and completion of life cycles in pool habitats having fine-grained substrates.

The manmade pond habitats located in the study area exhibit variability in terms of their age, drainage, use by cattle, past stocking, and fertilization history. Unlike the creeks and streams of the area, these aquatic habitats are almost always exposed to full sunlight and do not experience the large fluctuations in water level and flow associated with streams during heavy precipitation. Bottom materials in these ponds are universally silt-sized to clay-sized particles, either naturally occurring where the pond was built or added as a liner to prevent its leaking.

Playa lakes are shallow wetland areas that formed during the Pleistocene Era. There are more than 19,000 playa basins in the adjacent Southern High Plains Region of Texas, providing an estimated 229,957 to 249,964 ac of potential aquatic habitat. Playas occur, to a lesser extent, in the Rolling Plains as well. Playas are typically lined with Randall clay and are visibly different from the surrounding soils. There is no evidence of naturally occurring fish populations in playa lakes; however, some may be stocked with species such as channel catfish (*Ictalurus punctatus*). About 30% of all waterfowl wintering in Texas depend on playa environments, but this varies with adequacy of rainfall (Bolen et al., 1989).

According to Blair (1950), only one urodele (salamanders and newts), the tiger salamander (*Ambystoma tigrinum*) is of potential occurrence within the study area. Anuran (frogs and toads) species expected to occur within the study area include Couch's spadefoot toad (*Scaphiopus couchii*), red-spotted toad (*Bufo punctatus*), Blanchard's cricket frog (*Acris crepitans blanchardi*), and the plains leopard frog (*Rana blairi*) (Dixon, 1987; Conant and Collins, 1991).

Reptiles expected to occur in the study area include the ornate box turtle (*Terrapene ornata ornata*), northern earless lizard (*Holbrookia maculata maculata*), Texas spiny lizard (*Scleoporus olivaceus*), eastern collared lizard (*Crotaphytus collaris collaris*), great plains rat snake (*Elaphe guttata emoryi*), desert kingsnake (*Lampropeltis getulus splendida*), western coachwhip (*Masticophis flagellum testaceus*), and western diamondback rattlesnake (*Crotalus atrox*) (Dixon, 1987; Conant and Collins, 1991).

Birds observed by EH&A personnel during a field reconnaissance on 19-21 August 1996 include such year-round residents as the turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), northern bobwhite (*Colinus virginianus*), mourning

dove (*Zenaida macroura*), greater roadrunner (*Geococcyx californianus*), American crow (*Corvus brachyrhynchos*), Carolina wren (*Thryothorus ludovicianus*), northern mockingbird (*Mimus polyglottos*), loggerhead shrike (*Lanius ludovicianus*), lark sparrow (*Chondestes grammacus*), meadowlark (*Sturnella* sp.), and house sparrow (*Passer domesticus*). The Mississippi kite (*Ictinia mississippiensis*), scissor-tailed flycatcher (*Tyrannus forficatus*) and barn swallow (*Hirundo rustico*), all summer residents, were also observed in the study area.

Many other species of birds migrate through the study area in the spring and fall. Migrants/winter residents and/or species expected to occur in the study area during the spring/fall and/or winter include the northern harrier (*Circus cyaneus*), sharp-shinned hawk (*Accipiter striatus*), tree swallow (*Tachycineta bicolor*), house wren (*Troglodytes aedon*), ruby-crowned kinglet (*Regulus calendula*), hermit thrush (*Catharus guttatus*), cedar waxwing (*Bombycilla cedrorum*), orange-crowned warbler (*Vermivora celata*), yellow-rumped warbler (*Dendroica coronata*), and white-throated sparrow (*Zonotrichia albicollis*) (Scott, 1987; Texas Ornithological Society (TOS), 1995).

Mammals of potential occurrence on the study area include the western pipistrelle (*Pipistrellus subflavus*), nine-banded armadillo (*Dasypus novemcinctus*), desert cottontail (*Sylvilagus audubonii*), black-tailed jackrabbit (*Lepus californicus*), mexican ground squirrel (*Spermophilus mexicanus*), hispid pocket mouse (*Chaetodipus hispidus*), white footed mouse (*Peromyscus leucopus*), coyote (*Canis latrans*), common raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), bobcat (*Lynx rufus*), and white-tailed deer (*Odocoileus virginianus*) (Davis and Schmidly, 1994).

3.5.2 Recreationally and Commercially Important Wildlife

As stated in Section 3.4.3, a species is considered important if one or more of the following criteria applies: (a) the species is commercially or recreationally valuable; (b) the species is endangered or threatened; (c) the species affects the well-being of some important species within criterion (a) or criterion (b); or (d) the species is critical to the structure and function of the ecological system or are biological indicators.

Numerous species of wildlife within the study area provide human benefits. These benefits result from both consumptive and non-consumptive uses of the wildlife resources. Non-consumptive uses include activities such as observing and photographing wildlife, birdwatching, etc. These uses, although difficult to quantify, deserve consideration in the evaluation of the wildlife resources of the study area. Consumptive uses of wildlife species, such as hunting and trapping, are easier to quantify. Consumptive

and non-consumptive uses of wildlife are often enjoyed contemporaneously, and are generally compatible. Many species occurring in the study area provide consumptive uses, and all provide the potential for non-consumptive benefits.

The white-tailed deer is the most important big game animal in the state. Its populations are, however, relatively low in the Rolling Plains (5.3% of state total in 1995). Where suitable habitat exists, huntable populations of white-tailed deer may be found. The 1994 white-tailed deer population estimates for Fisher and Scurry counties are 229 and 504 deer, respectively (Young and Richards, 1996). During the 1994-95 hunting season, hunters harvested approximately 336 deer in Scurry County; no deer were reported harvested in Fisher County (Boydston, 1996).

Other game species regularly hunted within the Rolling Plains include the northern bobwhite, mourning dove, rabbits, and various species of migratory waterfowl (Roberson, 1995; Sullivan, 1995).

Furbearers (e.g., common raccoon, Virginia opossum (*Didelphis virginiana*), bobcat, gray fox (*Urocyon cinereoargenteus*), striped skunk, and mink (*Mustela vison*)) are of considerable economic and recreational importance in Texas. On a statewide basis, furbearers harvested during the trapping seasons from 1984-1985 to 1994-1995 had an average annual value to Texas trappers of approximately $3.3 million. During the 1994-1995 season the annual fur harvest was approximately $958,000, an increase of 33% compared to the 1993-1994 season. During the 1994-1995 season, the common raccoon harvest was the most at approximately $540,000, followed by the coyote harvest ($106,733) and the bobcat harvest ($99,458). TPWD data show the common raccoon to be the most commonly observed species in the Rolling Plains region (DelMonte, 1996).

3.5.3 Endangered and Threatened Wildlife

Table 3-1 lists wildlife taxa that have a geographic range including Scurry and Fisher counties and that are considered by FWS, TPWD, or the Texas Organization for Endangered Species (TOES) to be endangered, threatened or candidate species. Numerous sources were reviewed to develop the list, including FWS (1992, 1994, 1996), TPWD (1995, 1996), TOES (1995), and BCD (1996). It should be noted that inclusion in this list does not imply that a species is known to occur in the study area but only acknowledges the potential for occurrence. In fact, many species are unlikely to be present. The following paragraphs present distributional data concerning each federally or state-listed species and a brief evaluation of the potential for the species to occur within the study area.

TABLE 3-1

ENDANGERED, THREATENED, OR CANDIDATE WILDLIFE OF POTENTIAL OCCURRENCE IN THE STUDY AREA[1]

Common Name[2]	Scientific Name[2]	Status[3]		
		FWS	TPWD	TOES
Texas horned lizard	*Phrynosoma cornutum*	--	T	T
Brown pelican	*Pelecanus occidentalis*	E	E	E
White-faced ibis	*Plegadis chihi*	--	T	T
American peregrine falcon	*Falco peregrinus anatum*	E	E	E
Arctic peregrine falcon	*Falco peregrinus tundrius*	E/SA	T	T
Mountain plover	*Charadrius montanus*	C	--	--
Interior least tern	*Sterna antillarum athalassos*	E	E	E

1 According to Raun and Gehlbach (1972), Oberholser (1974), Burt and Grossenheider (1976), Smith (1978), Peterson (1980), Smith and Brodie (1982), Robbins et al. (1983), Schmidly (1983), Tennant (1984, 1985), Scott (1987), Dixon (1987), Garrett and Barker (1987), Conant and Collins (1991), FWS (1992, 1994, 1996), Davis and Schmidly (1994), Rappole and Blacklock (1994), TOES (1995), TOS (1995), TPWD (1995, 1996), and BCD (1996)

2 Nomenclature follows AOU (1983, 1985, 1987, 1989, 1991, 1993, 1995), Collins (1990), and Jones et al. (1992)

3 FWS - Fish and Wildlife Service
TPWD - Texas Parks and Wildlife Department
TOES - Texas Organization for Endangered Species
C - Federal candidate species; enough information about its vulnerability and threat(s) is available to propose it for listing as endangered or threatened.
E - Endangered; in danger of extinction
T - Threatened; severely depleted or impacted by man
E/SA - Endangered due to similarity of appearance. No longer biologically threatened or endangered, but is similar to a listed endangered species.
-- - Not listed

Three taxa listed in Table 3-1 are considered by both the FWS and TPWD as endangered. These are the brown pelican (*Pelecanus occidentalis*), American peregrine falcon (*Falco peregrinus anatum*), and interior least tern (*Sterna antillarum athalassos*). The arctic peregrine falcon (*Falco peregrinus tundrius*) is listed by TPWD as threatened. The FWS, however, no longer considers this species to be threatened, but lists it instead as endangered due to similarity of appearance (E/SA) to the endangered American peregrine falcon. The mountain plover (*Charadrius montanus*), while not currently listed by FWS or TPWD, is an FWS candidate species to be listed as endangered or threatened. Candidate species are those where enough information about their vulnerability and threat(s) is available to propose them for listing as endangered or threatened. TPWD lists the white-faced ibis (*Plegadis chihi*) and Texas horned lizard (*Phrynosoma cornutum*) as threatened; neither is listed by FWS although the FWS considers them SOC. SOC are species for which some evidence of vulnerability exists, but not enough to support listing at this time. These species (SOC) have no legal protection under the Endangered Species Act.

The brown pelican is primarily a coastal species that rarely ventures very far out to sea or inland. In Texas, it occurs primarily along the lower and middle coasts, but occasional sightings are reported on the upper coast and inland to central, north-central and eastern Texas (TOS, 1995), usually on large freshwater lakes. Such occurrences are relatively uncommon. This species has not been reported from either Scurry County or Fisher County (FWS, 1992; TPWD, 1995; see also agency letters in Appendix A) and the likelihood of brown pelicans visiting the study area, even as occasional vagrant individuals, is considered remote.

Both the American peregrine falcon and arctic peregrine falcon are statewide migrants in Texas (FWS, 1992; TOS, 1995) and thus could occur in the study area during the spring and fall migrations. The National Fish and Wildlife Laboratory (NFWL, 1980), however, does not include Scurry and Fisher counties as within the breeding range or main migration range of these falcons. Their occurrence in the study area is unlikely other than as rare migrants.

The interior least tern is a potential migrant through the study area. This bird winters primarily along the Texas coast and breeds along inland river systems (TPWD, 1995). Its presence in the study area is possible; however, this species has not been reported from either Scurry County or Fisher County (Oberholser, 1974; FWS, 1992; TPWD, 1995; see also agency letters in Appendix A).

The mountain plover is a migrant that is known to winter in south Texas and summer in the panhandle in northwest Texas. It is reported as a migrant throughout Texas (TOS, 1995) and is of possible occurrence in the study area as a migrant.

The white-faced ibis, an inhabitant of marshes, is a rare to uncommon spring and fall migrant throughout Texas and Louisiana (TOS, 1995). It may occur as a migrant in the study area.

TPWD (see letter in Appendix A) mentions one other SOC as being of potential occurrence in the study area: the burrowing owl (*Speotyto cunicularia hypugaea*). This species is an inhabitant of open grasslands and is often seen in prairie dog towns. A spring record exists for Scurry County (Oberholser, 1974).

The Texas horned lizard occurs throughout the state, typically in areas of flat, open terrain with sparse vegetative cover on sandy or loamy soil. It has been recorded from both Scurry and Fisher counties (Dixon, 1987) and thus may occur within the study area.

3.6 SOCIOECONOMICS

This section presents a summary of the social, economic and demographic characteristics of Fisher and Scurry counties. Reviewed literature sources include publications of the Texas Employment Commission (TEC) (now known as the Texas Work Force Commission), the Texas State Data Center (TSDC), the Texas Comptroller of Public Accounts (TCPA), the Texas Almanac and State Industrial Guide (1993, 1994 and 1995), and the U.S. Bureau of the Census.

3.6.1 Population Trends

Snyder (1993 estimated population of 12,441) is the Scurry County seat. It is home to Western Texas College, various manufacturers, a hospital, and is an oil center. Other towns in the county (but outside the study area) include Hermleigh (200), located approximately eleven miles southeast of Snyder, and numerous small communities with populations under 200 such as Union, Dunn, and Knapp.

As shown in Table 3-2, Scurry County has experienced variable population growth since 1970. Between 1970 and 1980, the population increased by 15%, about half the growth rate witnessed by the state during the same period. Between 1980 and 1990, the county expanded by only 2%, far less

TABLE 3-2

POPULATION TRENDS FOR FISHER AND SCURRY COUNTIES
AND THE STATE OF TEXAS

A. POPULATION 1970 -1990

Place	Population			Percent Change			
	1970	1980	1990	1970-80	1980-90	1970-90	Average Annual 1970-90
Fisher County	6,344	5,891	4,842	-7.1	-17.8	-23.7	-1.2
Scurry County	15,760	18,192	18,634	15.4	2.4	18.2	0.9
State of Texas	11,196,730	14,229,191	16,986,510	27.1	19.4	51.7	2.6

B. POPULATION PROJECTIONS 1990-2030

Place	Population	Projected				Percent Change				
	1990	2000	2010	2020	2030	1990-2000	2000-10	2010-20	2020-30	Average Annual 1990-2030
Fisher County	4,842	4,625	4,417	4,178	3,907	-4.5	-4.5	-5.4	-6.5	-0.5
Scurry County	18,634	19,002	19,197	19,082	18,741	2.0	1.0	-0.6	-1.8	0.0
State of Texas	16,986,510	20,344,813	24,128,848	28,684,923	33,912,478	19.8	19.8	18.9	18.2	2.5

Source: TSDC, 1996. 1980-90 Migration Series (1.0 Scenario); Texas Almanac , 1993.

than the state average of 19%. Scurry County's population increased over the twenty year period by 18% (an average annual population increase of less than 1%). In contrast, the state population increased by 52% (an average annual increase of 2.6%). The county population density, 21 persons per square mile (ppsqm), is, not surprisingly, much lower than the state average of 64 ppsqm, or the average of 2,105 ppsqm for Dallas County - the densest Texas county. Recent estimates by the TSDC place the county population at 18,911 as of 1 July 1994. This recent increase of 277 persons represents a 1.5% rise over the four year period.

Roby (estimated 1993 population of 593) is the county seat in Fisher County. Other communities in the county (but outside the study area) include Rotan (1,829), Royston and numerous small communities. Rotan, approximately 10 miles northwest of Roby, houses a gypsum plant and oil mill.

Fisher county has experienced population losses for each decade between 1970 and 1990, with an overall drop of 24% (an average annual growth rate of -1.2%), as shown in Table 3-2. The county population density (based on 1991 population estimates) is 5 ppsqm. Recent estimates by the TSDC place Fisher county's population at 4,646 as of 1 July 1994 (TSDC, 1995). This recent decrease of 196 persons represents a 4% loss since 1990.

TSDC population projections for both Fisher and Scurry counties forecast a gradual decline in already low or non-existent growth rates through 2030. As shown in Table 3-2, keeping with historical trends, county population growth trends are projected to remain below the state annual average of 2.5%.

3.6.2 Employment

As shown in Table 3-3, the civilian labor force (which includes both the employed and those actively seeking work) increased between 1980 and 1990 in both counties. Fisher County had a minimal increase of 0.3% from 2,357 to 2,437. Scurry County's labor force, in keeping with the state average yearly change of 2.8%, expanded from 8,449 to 10,677, an increase of 2.6%.

The labor force in both Fisher and Scurry counties suffered dramatic losses from 1992 to 1993, dropping by 17% and 31% respectively. Despite a decrease in the unemployment rate in 1995, annual employment for Fisher County continued to drop, resulting in a 6.9% average annual employment rate for the years 1992 through 1995.

TABLE 3-3

CIVILIAN LABOR FORCE AND UNEMPLOYMENT RATE FOR
FISHER AND SCURRY COUNTIES AND THE STATE OF TEXAS

A. CIVILIAN LABOR FORCE 1980-1994

	Civilian Labor Force										
	Employment		Avg.Yrly. Chg.	Employment				Annual Change			Average Yrly.
Place	1980	1990	1980-90	1992	1993	1994	1995	1992-93	1993-94	1994-95	1992-95
Fisher County	2,357	2,437	0.3	2,413	2,003	1,970	1,920	-17.0	-1.6	-2.5	-6.8
Scurry County	8,449	10,677	2.6	11,212	7,778	8,141	7,859	-30.6	4.7	-3.5	-10.0
Texas *(in 1000s)*	6,737	8,597	2.8	8,973	9,140	9,384	9,568	1.9	2.7	2.0	2.2

B. ANNUAL AVERAGE UNEMPLOYMENT RATE 1980 - 1994

Place	1980	1990	1991	1992	1993	1994	1995
Fisher County	3.1	6.4	6.1	6.8	6.8	8.4	5.6
Scurry County	2.8	4.6	5.9	7.5	7.2	6.4	4.7
Texas	5.2	6.2	6.6	7.5	7.0	6.4	5.6

Source: TEC, 1980, 1990A, 1991, 1992A, 1993, 1994, 1995a.

The labor force in Scurry County seemed to recover in 1993-1994, showing a 4.7% increase. However, employment declined again in 1995, contributing to the -10% average annual growth rate for the three year period. Employment in both counties fell well below the state average annual gain of 2.2% for the same years. However, unemployment rates for both counties between 1990 and 1995 are comparable to, or even less than, the state average (Table 3-3(B)).

As shown in tables 3-4 and 3-5, a comparison of fourth-quarter TEC employment figures for 1990 and 1995 show that the change in covered employment in both counties did not meet the 13% gain witnessed by the state. In fact, total covered employment in Fisher County decreased by 5.7% and increased in Scurry County by only 0.3%. Covered employment data incorporates jobs that are located in the county and includes workers covered by state unemployment insurance and most agricultural employees. The data excludes self-employed persons and federal employees. As shown in Table 3-4(A), the state/local government sector in Fisher County experienced growth (25%) that greatly exceeded that within the same sector at the state level (14%). Service employment remained steady during the five year period, though growth at the state level in this sector was three times as much despite the fact that manufacturing employment is also included in the service sector. Because manufacturing employment in Fisher County is accounted for by one or two employers, employment numbers for these establishments are included in the service sector. The National Gypsum Company, the holding company for Gold Bard Building Products provides approximately 100-249 jobs (Directory of Texas Manufacturers, 1991). Agriculture remained one of the four major employment sectors in the county despite an 11% drop in employment.

Scurry County showed positive growth over the five year period in three of its four major employment sectors - service, trade and state/local government, though none surpassed the state average for each sector. Mining (which includes the oil and gas industry), although not one of the state's four major employment sectors, remained the strongest employment sector within Scurry County despite suffering an 8% loss over the four year period.

Per capita income in Fisher County increased by 94% from $7,752 in 1980 to $15,048 in 1990. Despite the increase, the 1990 per capita income of Fisher County was almost $1,669 less than the overall state average of $16,717, however it matches the per capita regional average of $15,045 (TCPA, 1992).

Scurry County's per capita income also increased from $9,158 in 1980 to $14,494 in 1990. This $5,336 change represents a 58% increase, but still leaves the county $2,223 below the per capita

TABLE 3-4

COVERED EMPLOYMENT AND MAJOR EMPLOYMENT SECTORS
FOURTH QUARTER 1990 AND 1995: FISHER COUNTY
AND THE STATE OF TEXAS

A. FISHER COUNTY - MAJOR COVERED EMPLOYMENT SECTORS

Employment Sector	Fourth Quarter Employment		Percent Total Employment		% Change
	1990	1995	1990	1995	1990-95
Service	286	306	26.1	29.7	7.0
Trade	139	155	12.7	15.0	11.5
Government	304	380	27.8	36.8	25.0
Agriculure	142	126	13.0	12.2	-11.3
Subtotal	871	967	79.6	93.7	11.0
TOTAL EMPLOYMENT	1,094	1,032	-	-	-5.7

B. STATE OF TEXAS - MAJOR COVERED EMPLOYMENT SECTORS

Employment Sector *(in 1000s)*	Fourth Quarter Employment		Percent Total Employment		% Change
	1990	1995	1990	1995	1990-95
Service	1,638	1,985	23.0	24.7	21.2
Trade	1,759	1,990	24.7	24.8	13.1
Government	1,272	1,451	17.9	18.0	14.0
Manufacturing	999	1,039	14.0	12.9	4.0
Subtotal	5,667	6,465	79.7	80.4	14.1
TOTAL EMPLOYMENT	7,112	8,037	-	-	13.0

Source: TEC, 1990b; 1995b.

TABLE 3-5

COVERED EMPLOYMENT AND MAJOR EMPLOYMENT SECTORS
FOURTH QUARTER 1990 AND 1995: SCURRY COUNTY
AND THE STATE OF TEXAS

A. SCURRY COUNTY - MAJOR COVERED EMPLOYMENT SECTORS

Employment Sector	Fourth Quarter Employment		Percent Total Employment		% Change
	1990	1995	1990	1995	1990-95
Service	660	704	10.0	10.7	6.7
Trade	1,343	1,422	20.4	21.5	5.9
Government	1,513	1,644	23.0	24.9	8.7
Mining	1,923	1,771	29.2	26.8	-7.9
Subtotal	5,439	5,541	82.7	84.0	1.9
TOTAL EMPLOYMENT	6,579	6,600	-	-	0.3

B. STATE OF TEXAS - MAJOR COVERED EMPLOYMENT SECTORS

Employment Sector *(in 1000s)*	Fourth Quarter Employment		Percent Total Employment		% Change
	1990	1995	1990	1995	1990-95
Service	1,638	1,985	23.0	24.7	21.2
Trade	1,759	1,990	24.7	24.8	13.1
Government	1,272	1,451	17.9	18.0	14.0
Manufacturing	999	1,039	14.0	12.9	4.0
Subtotal	5,667	6,465	79.7	80.4	14.1
TOTAL EMPLOYMENT	7,112	8,037	-	-	13.0

Source: TEC, 1990b; 1995b.

state average and $551 below the regional average. Fisher and Scurry Counties are ranked 121 and 141 respectively among the 254 Texas counties for average per capita personal income (TCPA 1992).

3.6.3 Leading Economic Sectors

As shown in tables 3-4 and 3-5, a comparison of TEC fourth quarter 1990 and 1995 employment figures show that employment trends in the major employment sectors in Fisher and Scurry counties varied only slightly over the years and remained consistently behind state trends (TEC, 1990b; 1995b). Leading covered employment sectors in Fisher County for fourth quarter 1990 were government, service, transportation & public utilities, and agriculture (Table 3-4). These accounted for 94% of total employment. In 1995 trade surpassed agriculture as a leading employer, and transportation, communications & public utilities suffered a dramatic loss of 93 employees, pushing it back to fifth. The top four employment sectors in 1995 were state/local government, service, trade and agriculture, accounting for nearly 94% of total employment (TEC, 1995a).

As shown in Table 3-5, the four major employment sectors in Scurry County for 1990 and 1995 were mining (oil production), state/local government, trade and service. These sectors accounted for slightly more than 80% of total employment within the county in both 1990 and 1995. Manufacturing and transportation, communications & public utilities continually grappled for fifth and sixth rankings.

Important industries within both counties are oil and gas production. Gypsum production is also important to Fisher County (Texas Almanac, 1995). Scurry County is ranked as one of the top Texas counties in oil production according to the Railroad Commission of Texas (RRC, 1995).

3.6.4 Community Values

The term "community values" is included as a factor for the consideration of transmission line certification under Section 2.255.(c) of the Public Utility Regulatory Act of 1995. This term has not been specifically defined for regulatory purposes by the PUC. However, on the CCN application for transmission lines, the PUC requests information concerning the following items under the general heading Community Values:

- approvals or permits required from other governmental agencies
- general description of the study area

- residences, businesses, schools, churches, cemeteries, hospitals, nursing homes, or other habitable structures within 200 ft of the centerline of the proposed project
- FAA-registered airstrips located in the area
- irrigated pasture or croplands utilizing center-pivot or other traveling irrigation systems
- number of parks and recreation areas within 1,000 ft of the proposed project
- number of historical and archaeological sites known to be within 1,000 ft of the proposed project
- number of AM, FM, microwave, or other electronic installations in the vicinity of the proposed project

Each of the above items, insofar as it affects community values, is discussed in the appropriate section of this document.

3.7 LAND USE AND AESTHETICS

3.7.1 Land Use

The study area lies almost equally in Scurry and Fisher counties in the southern panhandle area of west Texas. Snyder, the Scurry County seat, is located at the western end of the study area, and Roby, the Fisher County seat, is located at the eastern end. U.S. 180 connects the two cities, located approximately 32 miles apart. No other incorporated cities are located in the study area, but there are several smaller communities: Midway and Camp Springs in Scurry County, and Hobbs, Sardis, and Center in Fisher County. The study area is located in State Planning District No. 7 and the planning and advisory board for the region is the West Central Texas Council of Governments, with headquarters in Abilene.

Land use in Scurry County is primarily agricultural with ranching constituting the major activity. The latest available land use estimates (1987) indicate that approximately 45% of the total county area is classified as rangeland, and an additional 6% as pasture (SCS, 1990). Livestock are mostly beef cattle, dairy cows, and sheep. The next largest category is cropland, which makes up approximately 46% of the county. Major crops include cotton, hay, grain sorghum, wheat, and a few pecan orchards. Most farming is dryland although there are some areas east of Snyder that utilize circle-pivot irrigation. Remaining land uses in the county consist of urban, lakes and ponds, and miscellaneous categories (SCS, 1990). The Price Daniel Unit of the Texas Department of Criminal Justice is located east of Snyder on a section of land south of the Plainview Substation. Oil production, although relatively

small in actual acreage, is the major economic sector in the county. As of 1995, Scurry County was the fourth-ranked county in the state in terms of oil production. Most of the large producing fields are located north and west of Snyder, outside the study area boundary.

Land use in Fisher County is also predominantly agricultural, and ranching also constitutes the largest percentage of this use. Land use estimates from 1987 indicate that approximately 54% of the total county area is classified as rangeland and 1% as pasture (SCS, 1990). Livestock raised are mainly beef cattle, and some hogs. The next category in terms of total acres is cropland, which makes up approximately 44% of the county. Major crops include cotton, wheat, grain sorghum, and hay. Most of these crops are raised by dryland farming, but there is some row irrigation along the Clear Fork of the Brazos River, north of Roby, and some circle-pivot irrigation in the study area. Remaining land uses include urban areas, lakes and ponds, and miscellaneous uses (SCS, 1990). Mineral production in Fisher County includes oil, gas, and gypsum.

Land use within the study area largely mimics the pattern of the counties as a whole, with the local economy based on oil, cattle, and agribusiness. Generally, flatter areas east of Snyder and west of Roby are used for farming while the rougher, more broken lands in the vicinity of the Scurry/Fisher County line and around the headwaters of the Clear Fork support grazingland and mesquite brush. Residential land use within the study area is concentrated in and around Snyder and Roby. Rural areas are very sparsely populated with individual residences scattered among local farms and ranches, rural communities, along highways and FM roads, and at major road/highway intersections.

The proposed SN TX Substation is located in the Snyder Industrial Park (SN TX Park I), located east of Snyder. This facility is being sponsored by the Development Corporation of Snyder, the City of Snyder, and Scurry County. The first occupant of the park will be a cotton textile mill. The 37th Street Substation is located just outside the Snyder city limits, north of the city's wastewater treatment plant and recycling center. Zoning in areas immediately adjacent to the substation (within the city) includes commercial, light manufacturing, and multi-family uses.

3.7.2 Recreation

Scurry County and the City of Snyder operate several parks/recreation areas in Snyder, including the 192-ac Towle Memorial Park. Likewise, the City of Roby includes a city park and other recreational facilities within its boundaries. A review of the Texas Outdoor Recreation Inventory (TORI), USGS topographic maps, TxDOT county highway maps, and a field reconnaissance of the study area

revealed no other parks/recreation areas within the study area. TxDOT does operate two roadside parks along U.S. 180; one in Scurry County near the community of Midway and the other in Fisher County just west of Roby. Many private landowners in both counties lease their lands for hunting in the appropriate season. Primary game species are quail, dove, and turkey. J&L Game Bird Farms, located on U.S. 180 in Fisher County advertises day-hunting for quail, pheasant, and chukar.

3.7.3 Transportation/Aviation

The main transportation artery in the study area is U.S. 180, which runs between Snyder and Roby, and also connects these cities with other communities to the east and west. A network of state highways, FM roads, and county roads (CR) further connects study area communities and rural residents with the rest of the region.

A review of the Dallas Sectional Aeronautical Chart (National Oceanic and Atmospheric Administration (NOAA), 1996), the Airport/Facility Directory for the South Central U.S. (NOAA, 1995), the Texas Airport Directory (TxDOT, 1994), other federal, state, and local maps, as well as a field reconnaissance, found no public or military airports within the study area boundaries. The nearest airport is Winston Field, located southwest of Snyder on FM 1607. This facility has two primary runways (RWY): RWY 17-35 is 5,599 ft long and RWY 8-26 is 4,200 ft long. In Fisher County, the county airport is located outside the study area between Roby and Rotan on State Highway (SH) 70. The airport's main runway (RWY 16-34) is 3,300 ft long. Almost all of the study area is also within the Roby military operations area (MOA). This MOA is used for military flight training between sunrise and sunset from Monday through Friday at elevations above 12,000 ft mean sea level (msl) (NOAA, 1996a).

3.7.4 Aesthetics

Aesthetics is included as a factor for consideration in the evaluation of transmission facilities in Section 2.255.(c) of the Public Utility Regulatory Act of 1995. The term aesthetics refers to the subjective perception of natural beauty in a landscape by attempting to define and measure an area's scenic qualities.

Consideration of the visual environment includes a determination of aesthetic values (where the major potential effect of a project on the resource is considered visual) and recreational values (where the location of a transmission line could potentially affect the scenic enjoyment of the area). Aesthetic values considered in this analysis, which combine to give an area its aesthetic identity, include:

- topographical variation (hills, valleys, etc.)
- prominence of water in the landscape
- vegetation variety (forests, pasture, etc.)
- color
- diversity of scenic elements
- degree of human development or alteration
- overall uniqueness of the scenic environment compared to the larger region

Overall, the study area exhibits a low-to-medium level of aesthetic quality. The topography is relatively flat to rolling except in the area around the headwaters of the Clear Fork of the Brazos River in eastern Scurry County, where the river and its tributaries have created a rougher landscape of broken hills and incised stream channels. Elevations in the study area range from 1,890 ft above msl at the extreme east end of the study area north of Roby along Cottonwood Creek, to approximately 2,500 ft msl at the western end of the study area, north of Snyder. Since the Clear Fork is near its beginning, the river is dry most of the year, carrying water primarily during the wet season and after locally heavy rains. Most of the tributary streams in the study area are also intermittent. Much of the study area has been cleared of its native vegetation for agricultural uses, especially farming. Remaining areas, often used for grazing cattle, range from brushland to more heavily wooded tracts, primarily mesquite. With the exception of the urban/suburban areas around Snyder and Roby, there is very little non-agricultural development in the study area.

EH&A's aesthetic survey found no outstanding scenic resources, designated scenic views, or unique visual elements within the study area. Overall, little distinguishes the scenic quality of the study area from that of other adjacent areas in the region.

3.8 CULTURAL RESOURCES

The following presents the cultural setting of the study area. A discussion of the prehistory and history of the region is presented, followed by a summary of the previous archaeological investigations conducted in Fisher, Scurry, and the surrounding counties. Finally, the results of the records review is presented.

3.8.1 Cultural Setting

As shown in Figure 3-5, the study area is part of the Panhandle Plains cultural region. For this region archaeologists have recognized four distinct cultural stages: three prehistoric stages (Paleo-Indian, Archaic, and Late Prehistoric or Neo-Indian) and one historic stage. Each of the prehistoric stages has been defined on the basis of ecological adaptation and specific diagnostic materials. The historic period reflects both the effect of European in-migration on the native populations and the actual settlement of the region by Europeans and Americans.

Each of the cultural stages are briefly described below.

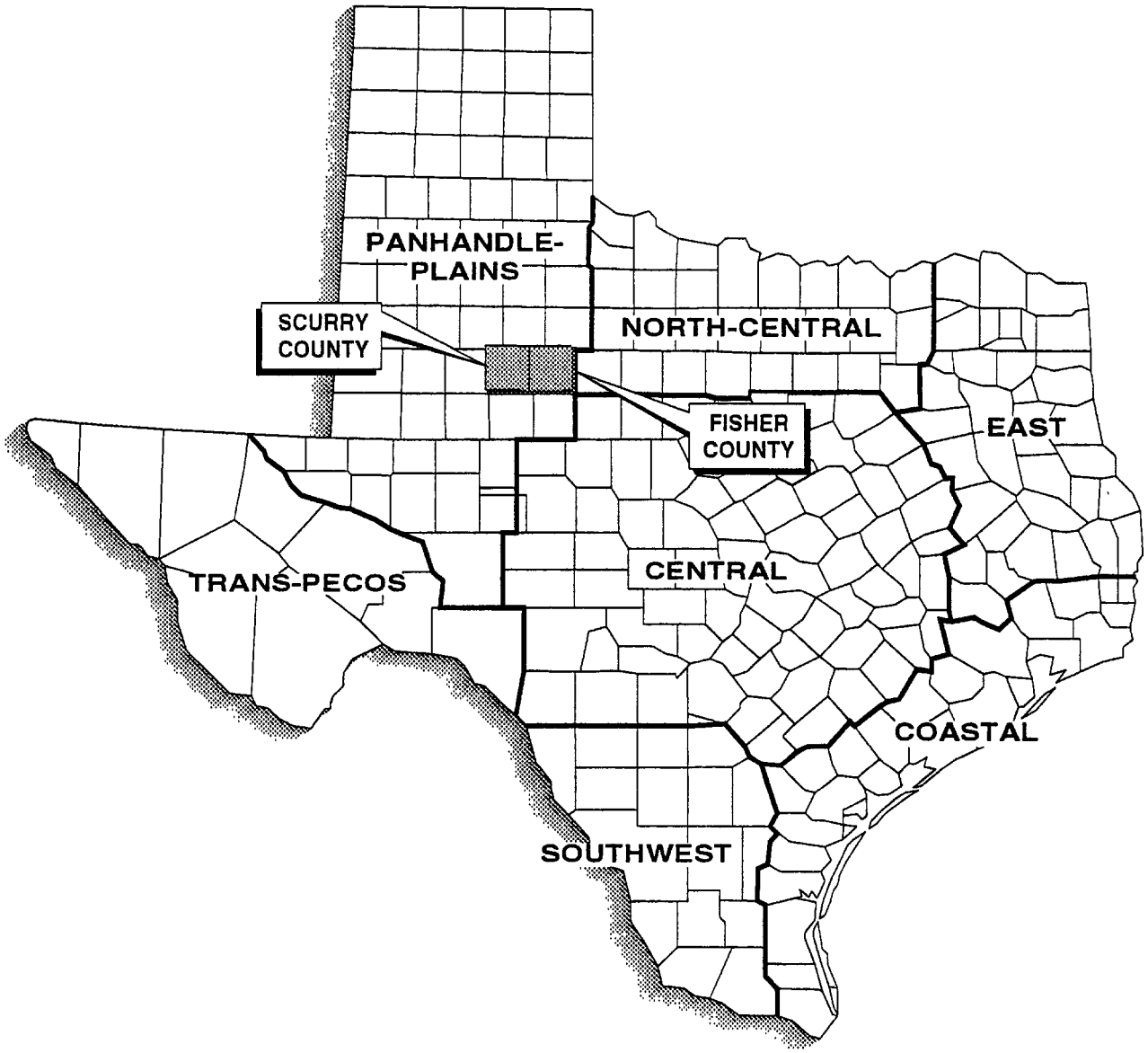
Paleo-Indian (10,000 B.C. - 5,000 B.C.)

The late Pleistocene and early Holocene Paleo-Indian stage is characterized by hunting of extinct and modern megafauna. There is also good evidence for the use of smaller animals (Hester, 1972; Johnson, 1987). The climate of the region was cooler and moister than today and had minimal seasonality. These conditions resulted in a high diversity of plants and animals available to Paleo-Indian groups (Graham and Lundelius, 1984).

Although the subject of intense archaeological interest for many years, the lifeways of Paleo-Indians are still poorly known. Most of the sites are kills rather than camps. The available information about cultural patterns is incomplete.

The Paleo-Indian stage on the Panhandle Plains and the surrounding region is subdivided into a sequence of four main cultures (Holliday, 1987). From earliest to latest these are Clovis, Folsom, Plainview, and Firstview. Distinctive projectile points and economic activities differentiate the Paleo-Indian cultures.

The primary marker of the Clovis culture is the Clovis fluted point. Clovis hunters commonly attacked now-extinct megafauna such as mammoths. A number of Clovis sites occur in the region. These include the Clovis type site at Blackwater Draw Locality #1 near Clovis, New Mexico (Hester, 1972) and the Roberts County Miami site on the northern edge of the Llano Estacado (Sellards, 1938). Johnson and Holliday (1985) report Clovis material at the Lubbock Lake Site in Lubbock County.



north

100 0 100 200

scale in miles

Source: Texas Archeological Society, 1954

Espey, Huston & Associates, Inc.
Engineering & Environmental Consultants

Figure 3-5

LOCATION OF
FISHER AND SCURRY COUNTIES
IN RELATION TO THE
CULTURAL RESOURCES AREAS OF TEXAS

The Folsom culture is characterized by the hunting of now extinct species of bison using a more refined fluted point than Clovis. Regional Folsom sites include the type site near Folsom, New Mexico (Figgins, 1927), the Lipscomb sites in Lipscomb County (Wormington, 1957), the Lubbock Lake site in Lubbock County, the Adair-Steadman site in Fisher County (Tunnell, 1977), and the Briscoe County Lake Theo site (Harrison and Smith, 1975).

The Plainview culture was similar to the Folsom culture in its use of bison. The Plainview point, however, was unfluted and parallel-flaked. Sites of this culture include the Plainview Site in Hale County (Sellards et al., 1947).

The terminal Paleo-Indian Firstview culture hunted both extinct and modern bison with unfluted, parallel-flaked points similar to Plainview. Sites in the region with Firstview components include Blackwater Draw Locality #1 and Lubbock Lake.

Environmental changes and the resultant adaptation by later cultural groups defines the end of the Paleo-Indian stage. By about 5,000 B.C. the wet and cool conditions of the Anathermal gave way to much warmer and drier conditions. Most megafauna species, including mammoth, mastodon, and some bison species, as well as Anathermal plants became extinct.

Archaic (5,000 B.C. - A.D. 1)

The beginning of the Archaic stage coincides with the onset of the more xeric climate of the Altithermal (Johnson and Holliday, 1986). The warmer and drier Altithermal climate purportedly diminished vegetation cover and exposed the ground surface to erosion. Streams and ponds were dry. Hughes (1991) believes that poor grazing and scarce water drove bison and other game animals from this region to seek more favorable conditions elsewhere.

In contrast to the Paleo-Indian stage, the Archaic is characterized by hunting modern animals with a variety of dart points. There is also heavy use of grinding implements and boiling pebbles throughout the Archaic (Hughes and Willey, 1978). The material remains show more reliance on small game and wild plant foods than during the Paleo-Indian stage.

We have less archaeological information about the Archaic stage than about any other cultural stage in this region. In general, Archaic stage sites are very scarce in this area. Johnson and

Holliday (1986) suggest that the lack of Archaic sites, in part, may be due to conditions during that period that were less conducive to site preservation than conditions at other times.

Hughes (1991), however, believes that the scarcity reflects actual abandonment. He argues that as the animals left the Altithermal Rolling Plains and surrounding regions so did the Archaic hunters. In contrast, sites like Lubbock Lake seem to show that the area was not totally abandoned during the Archaic stage. Occupation throughout the Archaic stage occurs there (Johnson and Holliday, 1986).

Altithermal climatic conditions changed to Medithermal conditions about 2000 B.C. The more mesic conditions of the Medithermal allowed the return of the bison. With the bison came Late Archaic hunters (Hughes and Willey, 1978). These hunters left more frequent evidence of their presence in the area. Late Archaic sites usually contain many bison-processing tools such as trianguloid knives and large end scrapers. Milling stones and other food grinding implements are also abundant on Late Archaic sites (Hughes, 1991), suggesting some economic diversification.

Sites of this time period are usually identified on the basis of dart points which exhibit a general evolution during the Archaic from basal- and corner-notched to side-notched styles. Overall population was increasing, and small migratory bands hunted deer and smaller animals and gathered wild plants within territorial ranges. Sites of this time period are large to small open camps in the bottoms of the stream-fed canyons and below pour-offs on tributaries where natural water pools are formed. Some sites contain mortar holes; the sites with holes may be permanent camps and those without may be hunting camps (Gustavson, 1986).

Archaic materials have been recovered from very few excavated sites in the Rolling Plains and the adjacent High Plains. Archaic projectile points have been recovered from the Floydada Country Club site (Word, 1963), the Pete Creek site (Parsons, 1967) and from a transitional Archaic/Late Prehistoric component at the County Line and Blue Clay sites in the MacKenzie Reservoir area (Hughes and Willey, 1978). Several Archaic period sites were discovered in Scurry County by Jelks (1952) during the survey conducted for the Colorado City Reservoir.

Late Prehistoric (A.D. 1 - A.D. 1540)

The Late Prehistoric stage is characterized by the use of ceramic technology and the bow and arrow. Subsistence continued as hunting and gathering probably supplemented by horticulture. The Medithermal climate was essentially that of modern times. During the early part of the Medithermal,

however, conditions apparently were somewhat wetter and cooler than present. Bison may have been scarce in the region, but deer and smaller animals remained abundant. By about A.D. 1100 the climate had returned to warmer and drier conditions. Bison increased and were again a staple for prehistoric groups (Hughes and Willey, 1978; Johnson, 1987; Hughes, 1991).

Based on work at Justiceburg Reservoir in Garza and Kent counties north of the project area Boyd et al. (1990) divide the Late Prehistoric stage into early and late substages. They call the former Late Prehistoric I and the latter Late Prehistoric II. Hughes (1991) refers to the Late Prehistoric stage as the NeoIndian stage. He also subdivides this stage into early and late periods which correlate to Boyd et al.'s (1990) Late Prehistoric I and II.

Three Late Prehistoric I cultures occur near the project area: Lake Creek, Palo Duro and Eastern Jornada. The latter consists of Querecho and Maljamar phases.

Hughes (1962) characterized the Lake Creek culture on the basis of Woodland cordmarked pottery found with Scallorn-like arrowpoints. Mogollon brownwares in small numbers are also often found at Lake Creek sites (Hughes, 1962). Dwelling types for the culture are unknown. Radiocarbon dates range from about A.D. 200 to A.D. 900 (Hughes, 1991).

Palo Duro sites are most common in the Red River drainage. However, Boyd et al. (1990) assigns some sites on the southeastern Llano Estacado in the Brazos River drainage to the Palo Duro culture. Palo Duro sites typically yield Mogollon plain brown pottery and Deadman and Scallorn arrowpoints. Cruse (1992) reported Mogollon-style pithouses at the Kent Creek site in Hall County. Radiocarbon dates range from A.D. 120 to A.D. 1110 (Hughes, 1991)

Based on test excavations west of the project area in the southwestern Llano Estacado in New Mexico, Corley (1965) proposed an eastern extension of the Jornada branch of the Mogollon culture with a sequence of Querecho and Maljamar phases. Since 1965 Collins (1966, 1968) reported components of the Eastern Jornada phases at several other sites in southeastern New Mexico and Texas.

The Late Prehistoric II is identified by the appearance of side-notched triangular arrowpoints. Subsistence regimes included heavy reliance on bison as well as seasonal gathering and limited but increasing reliance on horticulture.

Historic

Historically, the project area lies in the eighteenth and nineteenth century Comancheria (Thurmond et al., 1981). European intrusions into the area may have begun as early as 1787 of Pedro Vial's trip from San Antonio de Bexar to Santa Fe probably led him through north Texas and the Panhandle. In the following year, Jose Mares, returning from Santa Fe, probably traveled through the Croton Breaks between Aspermont and Guthrie (Thurmond et al., 1981).

Other expeditions which may have crossed through or near the area include those of Albert Pike (1832), George Wilkens Kendall (1841), Randolph B. Marcy (1849, 1854), and General Ranald Slidell MacKenzie (1871). These explorers met and occasionally clashed with both the Apaches and Comanches who inhabited the area (Newcomb, 1975).

By 1880, both the Native Americans and the buffalo had been either forcibly removed from the area or killed and the land divided into huge ranches. The traditional land use of the project area has remained deeply rooted in cattle ranching.

Fisher County

Fisher County was established in 1886, ten years after Anglo-Americans first began settling in the area. Roby was soon after selected as the county seat. Since the first census in 1800, the livestock industry, supplemented by farming, has been the chief source of rural income. Oil and gas production, gypsum plants and the railroad have encouraged economic development in the county (Webb, 1952).

Scurry County

Scurry County was created in 1876 from Bexar Territory. Anglo-American settlement was delayed because of the county's remoteness and lack of railroad facilities. W.H. Snyder opened a trading post in 1877 which eventually developed into the town of Snyder. Scurry County was organized in 1884 with Snyder as the county seat. Dairying is the chief source of farm income with ranching as the second. Rail service establishment in 1909 and the discovery of oil in 1923 significantly increased county development (Webb, 1952).

3.8.2 Previous Investigations

The earliest investigations in the area were conducted in the 1920s and 1930s for the University of Texas by A.T. Jackson, G.E. Arnold and J.E. Pearce in Jones, Nolan, Shackelford, Taylor and Young counties. Cyrus N. Ray also did extensive work in these counties, most notably in the Abilene vicinity. Many of these early studies concentrated specifically on Paleo-Indian studies rather than on more general investigations of the area including sites dating to Archaic and post-Archaic cultural occupations.

Investigations by avocational and professional archaeologists during the 1960s began to provide a solid body of data upon which a more accurate picture of the region's prehistory could be based. Activities of the South Plains Archaeological Society were particularly useful in this respect. These include excavations in Floyd County at the Floydada Country Club site (Word, 1963) and at the Montgomery site (Word, 1965) and in Garza County at the Garza site (Runkles, 1964). All three of these sites produced Late Prehistoric and Historic aboriginal occupation debris, as did the Pete Creek and Morgan Jones sites in Crosby County (Parsons, 1967).

The 1960s and 1970s saw the initiation of numerous reservoir surveys within the region. These include Tunnell's (1960) survey of the Champion Creek Reservoir in Mitchell County, Malone and Briggs' (1970) survey of Miller Creek Reservoir in Baylor and Throckmorton counties, and Malone's (1970) and Hughes and Willey's (1978) surveys of the MacKenzie Reservoir in Swisher and Briscoe counties. Additional surveys include Hughes' (1972) survey of portions of the Wichita River drainage in Cottle, Foard, King and Knox counties as part of the Wichita River Chloride Control Project, the preliminary survey of proposed dam site areas for the Brazos Natural Salt Pollution control Project in Kent, King and Stonewall counties (Skinner, 1973) and a survey in the lower Tule Canyon area in Briscoe County (Katz and Katz, 1976).

Continuing investigations of the Wichita River Chloride Control Project area led to survey and limited testing at the Truscott Reservoir in King and Knox counties (Etchieson et al., 1979) and Crowell Reservoir and associated facilities in Cottle, Foard, King and Knox counties (Etchieson et al., 1979). One of the more important archaeological projects of the 1970s in the Panhandle-Plains regions was the testing conducted in the MacKenzie Reservoir by West Texas State University (Hughes and Willey, 1978).

Several major surveys have been conducted in the region during the 1980s including Thurmond, Freeman and Andrews' (1981) survey of additional areas associated with the Brazos Natural Salt Pollution Control Project in Kent, King and Stonewall counties and a survey of the Justiceburg Reservoir by Prewitt and Associates, Inc. (Boyd et al., 1990).

3.8.3 Results of the Literature/Records Review

A literature and records review was conducted for the proposed Snyder-Roby Transmission Line Project located in Fisher and Scurry counties, Texas. The purpose of this investigation was to locate previously recorded cultural resource sites within the study area.

The NRHP and the records of the THC were reviewed for the identification of recorded sites or sites determined eligible for inclusion on the NRHP. Research of available records and literature was also conducted at the Texas Archeological Research Laboratory, J.J. Pickle Research Center, the University of Texas at Austin. The Guide to Official Texas Historical Markers was also consulted.

Current records at TARL indicate that no archaeological sites have been officially recorded within the study area boundaries. However, records at the THC, discussed below, revealed both prehistoric and historic properties which have not yet received official State of Texas trinomial numbers. Based on records at the THC it was determined that three Texas Historical Markers are located within the study area.

One of the historical markers, located in a roadside park on U.S. 180, has information about Greene Springs, which is located about 2 miles southwest but still within the study area. The marker describes Greene Springs as the location of several prehistoric and historic archaeological sites. The prehistoric archaeological sites have been investigated by the Scurry Chapter, South Plains Archeological Society. According to the marker, since 1964 the Society has collected numerous prehistoric artifacts such as stone knives, scrapers, beads, potsherds and arrow points. Features such as food grinding holes and rock art have also been observed by members of the Society. However, as stated above no state trinomial numbers have been assigned to any of the sites at Greene Springs. The marker also notes that in the 19th century, military units under Capt. R.B. Marcy (1849) and Gen. Robert E. Lee (1856) camped at Greene Springs. The springs were named for a horse Rancher (J.L. Greene) who moved to the area in the early 1880s. Remains of the dugouts in which Greene and his family lived can still be seen on a nearby hill (Awbrey and Dooley 1992).

The second historic marker within the study area is placed at the location of The Old Town of Camp Springs. Named for W.H. Camp, an early settler in the area, the Old Town of Camp Springs, is a Recorded Texas Historic Landmark. According to the marker, bones of prehistoric animals and prehistoric artifacts indicate that the area was utilized by prehistoric inhabitants. Pictographs in nearby caves are also used as evidence for the presence of prehistoric inhabitants. Historically, Captain R.B. Marcy and Gen. Robert E. Lee have been chronicled as having passed through this area while searching for Comanches in 1849 and 1856, respectively. As with Greene Springs, none of the sites have been officially investigated or reported therefore, none have been assigned State of Texas trinomial site numbers.

The final historical marker is located at the site of the Hobbs Cemetery in Fisher County. The land on which the cemetery is located was donated by area residents Robert and Ann Hayter. According to the marker the Hobbs cemetery remains a reminder of the community's early history which began in the early 1880s.

All of the historical markers mentioned above are within the study area boundaries but none will be directly impacted by the construction of the proposed transmission line.

4.0 ENVIRONMENTAL IMPACTS

4.0 ENVIRONMENTAL IMPACTS OF THE ALTERNATIVE ROUTES

4.1 IMPACTS ON PHYSIOGRAPHY/GEOLOGY/SOILS

Construction of the proposed transmission line will have no significant impact on the geological resources of the study area. The construction of the structures will require the removal and minor disturbance of small amounts of surface material, but will have no measurable impact on the geological features or resources that occur along the proposed route options. Some economically valuable resources may occur in the study area, but this project will have no significant impacts associated with the potential loss of these resources. None of the alternative routes crosses any significant or unique geologic features.

During the construction and operation of the transmission line, very few long-term adverse effects on the region's soils will occur. The major impacts to soils are primarily erosion and compaction associated with construction of the line. Soil erosion is potentially greatest during the initial clearing of the ROW, especially at stream crossings. Portions of the ROW that are utilized for farming or grazing livestock would not need to be cleared by heavy equipment; therefore, soil compaction and erosion impacts in these areas would be minimal.

Natural succession should quickly revegetate the majority of the ROW. To maximize the protection of both land and water resources, special care should be taken when clearing near waterways. Vegetation on the stream banks should be left intact to the greatest extent practical. Revegetation of these areas, where necessary, should take priority over less-critical areas.

Prime farmlands occur within the study area. Other than potential construction-related erosion, impacts to prime farmland soils are expected to be insignificant and limited to the physical occupation of small areas at the base of support structures. These areas are very small in comparison to the total amount of prime farmlands found within the study area.

4.2 IMPACTS ON WATER RESOURCES

4.2.1 Surface Water

The construction and operation of the proposed transmission line should have little adverse impact on the water resources of the area. The main potential impact on water resources from any major

construction study is pollution resulting from erosion, and spillage of petroleum and other chemical products. Soil erosion control measures should minimize erosion and the resultant siltation, as well as any minor nutrient loading of the water resources. Extreme care should be exercised in the storage and handling of petroleum products, especially near the waterways.

If flowing water is present in any of the creeks to be spanned, construction machinery and equipment should be transported around via existing roads to avoid direct crossing of the streams. This would eliminate the necessity of constructing temporary low-water crossings that would result in erosion, siltation and disturbance of the stream and its biota. However, if a stream to be spanned is dry at the time of construction and some earth moving is necessary to facilitate crossing, to the extent practical, the area should be restored to pre-construction conditions. Selective clearing (i.e., use of chainsaws versus bulldozers) at stream crossings should be undertaken to minimize erosion problems. Highly erodible areas adjacent to the stream, such as stream banks, should not be cleared unless necessary. In any event, construction of the transmission line over a stream would result in some temporary erosion and siltation and short-term disturbance, but impacts would be minimal and localized because of the intermittent nature of most streams crossed by the alternative routes. No long-term adverse effects are anticipated.

Some transmission line structures will likely be placed within some of the floodplains. However, the structures should not impede the flow of any stream and will be constructed so as not to create any hazard during flood conditions.

4.2.2 Ground Water

The construction, operation and maintenance of the proposed transmission line is not expected to adversely affect ground water resources in the study area or its vicinity. The amount of recharge area disturbed by construction is insignificant compared to the total amount of recharge area available for the aquatic systems in the region. No measurable alteration of aquifer recharge capacity should occur, and the likelihood of ground water contamination is not significant.

The main potential impact on ground water resources from any construction project is pollution resulting from spillage of petroleum or other chemical products. The effect of the proposed transmission line on ground water resources will be negligible. Only the poles will be buried. Efforts should be made during construction for proper control and handling of any petroleum or other chemical products used.

4.3 IMPACTS ON ECOLOGICAL RESOURCES

4.3.1 Vegetation

The primary impact to vegetation that would result from construction of the proposed transmission line is the removal of existing vegetation from the areas required for the ROW. The length of each alternative route through various habitats is generally an important consideration in the impacts analysis. The greatest amount of vegetation clearing would be required in densely vegetated habitats, which are identified in tables 6-1 and 6-2 as upland woodland/brushland (mainly mesquite) and bottomland/riparian woodland. These areas are restricted within the study area, which is predominantly cropland or open, pastureland that is sparsely vegetated to a varying extent with grasses, cacti, yuccas, and shrubs. The vegetation types represented within the riparian woodland category are relatively open woodlands that could easily be spanned or avoided in many cases, due to their limited areal extent. Within cropland/pastureland, the ROW might be temporarily unavailable for grazing or agricultural purposes during construction. Once construction is complete, the ROW could be used as the landowner desires. The only land lost to grazing/agriculture would be that occurring beneath the structures.

The greatest potential for the occurrence of wetland habitats along any of the alternative routes is in association with stream crossings and playa lakes. Within the study area, wetland habitats may easily be spanned by the proposed transmission line; thus, structures would not be located within these sensitive areas.

The approximate extent of the vegetation communities occurring along the alternative routes was determined by measuring the linear distance from black-and-white aerial photography (at a scale of 1" = 1,000 ft) and cross-referencing the measurements with USGS 7.5-minute quads and FWS NWI maps. Potential bottomland/riparian woodland impacts were based on NWI mapping in addition to the aerial photography. The results of these measurements are presented in tables 6-1 and 6-2 and discussed below.

4.3.1.1 Plainview-Roby Segment (Segment A)

Of the eight proposed alternative routes for Segment A, Route 2A represents the least potential impact to vegetation. Tied with Route 1A, it crosses the second-least amount of woodland/brushland (approximately 29,300 ft) and little wetland area (approximately 250 ft). In addition, this route does not parallel any creeks. Much of this vegetation is low-growing scrub which can easily be spanned. Even taller riparian vegetation would likely require little clearing. Route 1A is the second

choice. It crosses the second-least amount of woodland/brushland (tied with Route 2A) and also little wetland area. Furthermore, this route parallels less riparian creek/stream habitat than any other route except Route 2A and 8A.

4.3.1.2 SN TX-37th Street Segment (Segment B)

Of the four proposed alternative routes for the SN TX-37th Street segment, Route 3B represents the least potential impact to vegetation. While it crosses the same amount of upland woodland/brushland (5,300 ft) and potential wetlands (50 ft) as the other three routes, it crosses the least amount of bottomland/riparian vegetation (approximately 1,500 ft). It also crosses the fewest streams (3). Alternative Route 2B is preferred over routes 1B and 4B as the second choice because it crosses less bottomland/riparian habitat, has less of its length paralleling streams, and crosses fewer streams.

4.3.2 Endangered and Threatened Plant Species

No endangered or threatened plant species are known from the study area or Scurry and Fisher counties. Therefore, no impacts to listed plant species are anticipated.

4.3.3 Wildlife

The impacts of transmission lines on wildlife can be divided into short-term effects resulting from physical disturbance during construction and long-term effects resulting from habitat modification. The net effect on local wildlife of these two types of impacts is usually minor. A general discussion of the impacts of transmission line construction and operation on terrestrial wildlife is presented below.

Any required clearing and other construction-related activities will directly and/or indirectly affect most animals that reside or wander within the transmission line ROW. Some small, low-mobility forms may be killed by the heavy machinery. These include several species of amphibians, reptiles, mammals and, if construction occurs during the breeding season, the young of many species including nestling and fledgling birds. Fossorial animals (i.e., those that live underground) such as mice and shrews may similarly be negatively impacted as a result of soil compaction caused by heavy machinery. Larger, more-mobile species such as birds, deer, jackrabbits and coyotes may avoid the initial clearing and construction activities and move into adjacent areas outside the ROW. Maintenance clearing activities during the breeding season may destroy some nests and broods. Wildlife in the immediate area may experience a slight loss of browse or forage material during construction; however, the prevalence of

similar habitats in adjacent areas and re-growth of vegetation in the ROW following construction will minimize the effects of this loss.

The increased noise and activity levels during construction could potentially disturb breeding or other activities of species inhabiting the areas adjacent to the ROW. These impacts are expected in most cases, however, to be temporary. Thus, although the normal behavior of many wildlife species will be disturbed during construction, little permanent impact to their populations will result.

Transmission line structures could benefit some bird species, particularly raptors, by providing nest sites and hunting perches. One of the more common species that uses such structures for nesting is the red-tailed hawk. The greatest use, however, is for hunting perches (Olendorff, et al., 1981). The wires and structures will increase the number of roosting sites over parts of the transmission line route for such species as the red-tailed hawk, American kestrel, mourning dove, loggerhead shrike, and meadowlarks. Raptors may utilize the support structures as nesting sites. The danger of electrocution to birds will be insignificant since the distance between conductors or conductor and structure or ground wire on 69-kV transmission lines is usually greater than the wingspan of any bird in the area (i.e., greater than 8 ft).

The transmission line (both structures and wires) could present a hazard to flying birds, particularly migrants. Collisions tend to increase in frequency during the fall when migrating flocks are denser and flight altitudes are lower in association with cold air masses, fog and inclement weather. The greatest danger of mortality exists during periods of low ceiling, poor visibility, and drizzle when birds are flying low, perhaps commencing or terminating a flight, when they may have difficulty seeing obstructions (Electric Power Research Institute (EPRI), 1993). Migrant species, however, including passerines, should be minimally affected during migration since their normal flying altitudes are greater than the heights of the proposed transmission structures (Willard, 1978; Gauthreaux, 1978). For resident birds or for birds during periods of non-migration, those most prone to collision are often the largest and most common in a given area (Rusz et al., 1986; Avian Power Line Interaction Committee (APLIC), 1994). Resident birds, or those in an area for an extended period, learn the location of power lines and become less susceptible to wire strikes (Avery, 1978). Raptors, typically, are uncommon victims of transmission line collisions due to their great visual acuity (Thompson, 1978). In addition, many raptors only become active after sufficient thermal currents develop, which is usually late in the morning when poor light is not a factor (Avery, 1978).

Potential impacts upon aquatic systems by a project of this nature involve mainly the effects of increased erosion and sedimentation. Land clearing and/or construction may result in increased suspended solids entering streams/creeks traversed by the transmission line, which in turn may negatively affect many aquatic organisms, which require relatively clear water for feeding and reproduction. However, because the creeks are largely intermittent and, therefore, dry except during high rainfall periods; because the transmission line will span the intermittent creeks; and because erosion controls will be utilized, few impacts, if any, are anticipated.

4.3.3.1 Plainview-Roby Segment (Segment A)

Of the eight proposed alternative routes for the Plainview-Roby segment, Route 2A represents the least potential impact to vegetation and, therefore, to wildlife habitat. Tied with Route 1A, it crosses the second-least amount of woodland/brushland (approximately 29,300 ft) and little wetland area (approximately 250 ft). In addition, this route does not parallel any creeks. Route 1A is the second choice. It crosses the second-least amount of woodland/brushland (tied with Route 2A) and also little wetland area. Furthermore, this route has parallels less riparian creek/stream habitat than any other route except Route 2A and 8A. If riparian woodland exists along these streams, it is likely that avian species would utilize it. The longer the length of line paralleling streams, the more potential to impact avian species utilizing the riparian habitat.

4.3.3.2 SN TX-37th Street Segment (Segment B)

Of the four proposed alternative routes for the SN TX-37th Street segment, Route 3B represents the least potential impact to vegetation and, therefore, to wildlife habitat. While it crosses the same amount of upland woodland/brushland (5,300 ft) and potential wetlands (50 ft) as the other three routes, it crosses the least amount of bottomland/riparian vegetation (approximately 1,500 ft). It also crosses the fewest streams (3). Alternative Route 2B is preferred over routes 1B and 4B as the second choice because it crosses less bottomland/riparian habitat, has less of its length paralleling streams, and crosses fewer streams.

4.3.4 Endangered and Threatened Wildlife

No federally listed endangered or threatened wildlife species are expected to be adversely affected by the proposed project.

No adverse impacts to any of the endangered or threatened wildlife species addressed in Section 3.5.3 are anticipated. Any listed fish occurring near the proposed project may be subjected initially to disturbance and increased siltation during construction, but such disturbances will be minimal and of short duration. The Texas horned lizard, if it occurs in the vicinity of the proposed project, may be impacted to some extent during the initial construction phases of the project. These impacts would be short term in nature, however, and not expected to be significant. Most listed avian species are unlikely to occur in the study area and those that do will be passing through during migration.

4.3.5 Summary of Natural Resources Impacts

Among the most significant factors considered in the evaluation of impacts to natural resources are those concerning the length of ROW through woodlands, endangered and threatened species, stream crossings, general proximity to waterways, and the distance across floodplains, potential wetlands and open water. The primary impact on vegetation from this project is the removal of existing vegetation from the areas required for the ROW. However, since the study area is predominantly cropland and open, heavily grazed rangeland that is sparsely vegetated to a varying extent with grasses, cacti, yuccas and shrubs, vegetation clearing will be minimal. Riparian woodlands are largely brush-dominated and could be easily spanned or avoided in most cases due to their limited areal extent. Wetland habitats are limited in the study area. A summary of the primary natural resources data used in the alternative route evaluation is shown in tables 6-1 and 6-2.

Of the eight primary alternative routes considered for the Plainview-Roby segment (A) and the four routes considered for the SN TX-37th Street segment (B), routes 2A and 3B are the preferred choices, respectively, from an overall ecological perspective. They represent the least potential impact to vegetation and wildlife. Routes 1A and 2B are the alternate choices.

4.4 SOCIOECONOMIC IMPACTS

4.4.1 Social and Economic Factors

Construction and operation of the proposed 69-kV transmission line would benefit WTU, MWEC, and residents of their service area by enabling the utilities to provide lower cost, more efficient, and more reliable electric service. The proposed 69-kV transmission line project would enhance the utilities' flexibility to deliver power as needed throughout the service area and would also allow them to serve new load in the Snyder area.

Short-term local employment may be generated during the construction phase of the proposed project, since WTU may use construction contractors to augment its existing work force. Money from construction payrolls would circulate within the local economy, resulting in indirect economic benefits to businesses in the area. In addition, other project-related funds may be used for local purchases of supplies and building materials. If new ROW is required, easement payments would be made to landowners based on the appraised value of land.

Long-term economic benefits potentially resulting from construction of the proposed project are based on the requirement for the utilities to provide a reliable and adequate level of power throughout the service area. Economic growth and development rely heavily on adequate public utilities, including a reliable electrical power supply. Without this basic infrastructure a community's potential for economic growth is constrained.

WTU is required to pay sales tax on its purchases and may be required to pay local property tax on land or improvements. In addition, since WTU will only require easements for its proposed line, no land will be taken off the tax rolls. Therefore, some positive impact to local tax revenues is expected. The cost of designing and constructing the line will be paid for through revenue generated by the sale of electrical service.

4.4.2 Impacts on Community Values

The term "community values" is included as a factor for the consideration of transmission line certification under Section 2.255.(c) of the Public Utility Regulatory Act of 1995, although the term has not been specifically defined for regulatory purposes by the PUC.

For the purposes of evaluating the effects of the proposed transmission line, EH&A has defined the term community values as a "shared appreciation of an area or other natural or human resource by a national, regional or local community". Adverse effects upon community values are defined as aspects of the proposed project which would significantly and negatively alter the use, enjoyment or intrinsic value attached to an important area or resource by a community. This definition assumes that community concerns are identified with the location and specific characteristics of the proposed transmission line and do not include possible objections to electric transmission lines per se.

Impacts on community values can be classified into two areas: (1) direct effects, or those effects which would occur if the location and construction of a transmission line results in the removal

of, or loss of public access to, a valued resource; and (2) indirect effects, or those effects which would result from a loss in the enjoyment or use of a resource due to the characteristics (primarily aesthetic) of the proposed line, structures or ROW. Impacts on community values, whether direct or indirect, can be more accurately gauged as they affect recreational areas or resources and the visual environment of an area (aesthetics). Impacts in these areas are discussed in detail in Sections 4.5.2 and 4.5.4 of this report. In addition, WTU/MWEC held two public open house meetings in the study area in a further attempt to determine local community values. This effort is described in Section 2.2.6.

4.5 LAND USE IMPACTS

4.5.1 Land Use

Land use impacts are determined by the amount of land, of whatever use, displaced by the transmission line ROW and by the compatibility of electric transmission line ROW with adjacent land uses. During construction, temporary impacts to land uses within the ROW may occur due to the movement of workers and materials through the area. Construction noise and dust, as well as temporary disruption of traffic flow on local roads, may also affect residents and businesses in the area immediately adjacent to the ROW. Coordination between WTU, its contractors, and landowners regarding access to the ROW and construction scheduling should minimize any such disruptions.

Agriculture is the primary land use within most of the study area and along virtually all of the primary alternative routes for both segments. Potential impacts to agricultural land uses include disruption or preemption of agricultural activities. Disruption includes the time lost going around or backing up to structures in order to cultivate as much area as possible and the general loss of efficiency compared to plowing or planting unimpeded in straight rows. Preemption of agricultural activities refers to the actual amount of land lost to production around the base of the structure.

The type and location of transmission line structures used in agricultural areas determine the nature and degree of potential impacts to farming operations. Generally, single-pole structures are preferable to H-frame or lattice towers because they present a smaller obstacle and take up less actual acreage at the foundation. Likewise, structures (and routes) located along field edges (property lines, roads, drainage ditches, etc.) generally present fewer problems for farming operations than a route running across an open field.

Since the ROW for this project will not be fenced or otherwise separated from adjacent lands, and since WTU intends to use only single-pole structures, there will be no long-term or significant displacement of farming or grazing activities. Most existing land uses may be resumed following construction. No crop or pasture land irrigated by circle-pivot or other above-ground mechanical means is crossed by any of the primary alternative routes.

Segment A

As shown in tables 6-1 and 6-2, all of the proposed alternative transmission line routes for Segment A cross mainly rural, agricultural areas, and between 51% to 64% of each of the alternative routes cross croplands. The route crossing the least amount of cropland is Route 5A (72,700 ft); while the worst is Route 2A (95,250 ft). Route 5A is best in this category both in total length and in the percentage of the route through cropland (51%). Further reinforcing this ranking is the fact that Route 5A crosses the least amount of NRCS-defined prime farmland soils of the eight alternatives considered. With regard to paralleling existing ROW (which generally corresponds to fewer impacts to agriculture), Route 8A is best overall, with 95% of the route paralleling either road or highway easements. Route 7A (with only 35% paralleling existing ROW) is the lowest ranked in this category.

Potential impacts to residential development (particularly the number of habitable structures within 200 ft of the centerline of a proposed route) is also one of the most important criteria for determining land use impacts. For Segment A, Route 7A has the fewest structures within 200 ft: 12, followed closely by Route 5A with 14. The difference between these two routes is primarily because large sections of Route 7A were routed cross-country, avoiding structures, and Route 5A was routed mainly parallel to road/highway ROW, where structures tend to be located. Routes 2A and 4A, with 32 and 26 structures, respectively, have the greatest number within 200 ft.

Segment B

For Segment B, length across cropland is not as important a factor because of its location between the proposed SN TX industrial park and the existing 37th Street Substation on the south side of Snyder. Nonetheless, Route 1B crosses the least cropland (3,500 ft) and Route 2B crosses the most (4,800 ft).

Habitable structures is a much more important criteria for this segment, given the location in and near Snyder. Route 2B, with 2 structures, has the least, while routes 1B and 3B each have 4 habitable structures within 200 ft of the ROW centerline.

4.5.2 Recreation

None of the primary alternative routes in either Segment A or Segment B will cross or directly impact any existing public park or recreation area. In Segment A, Route 7A is within 1,000 ft of the fewest number of parks and recreation areas: the two facilities in Roby (City Park and ballfields). Several of the routes are near 3 park/recreation facilities (routes 3A, 4A, 5A, and 6A) and the remainder are near four such facilities (routes 1A, 2A, and 8A). None of these facilities will be directly affected by the proposed line, nor will the potential indirect effects (visual) be significant. For Segment B, there are no park/recreation facilities within 1,000 ft of any of the alternative routes, so there will be no recreational impacts.

4.5.3 Transportation/Aviation

The only potential construction impacts to transportation would be a temporary disruption of traffic. Increased traffic may occur during construction of the proposed project. However, such impacts should be temporary and short-term. On Segment A, Route 7A crosses only one U.S. or state highway (SH 70), while routes 1A and 2A cross 11. Route 7A also crosses the least number of FM and county roads; 16, while routes 1A and 8A cross the greatest number, 20. For Segment B, all three alternatives cross 3 U.S. or state highways and 3 FM and county roads, so any potential impacts (temporary and not significant) will be equal. WTU will acquire highway crossing permits from TxDOT for all U.S., state, and FM road/highway crossings for their approved route. This will ensure that there are no conflicts with the continued, safe operation of these roads/highways or future roadway improvements.

The proposed transmission line will have a minimal effect on communication operations in the area. No commercial AM radio transmitters are located within 10,000 ft of any of the route centerlines for either segment. On Segment A, routes 1A and 2A each have one communications tower (a radio dispatch antenna at a business in Roby) within 2,000 ft, while all other routes have two (the antenna in Roby and an AT&T microwave tower on Camp Springs Road). There are no FM, microwave, or other similar electronic communications towers within 2,000 ft of any of the three routes on Segment B.

The proposed transmission line facilities will have a minimal effect on aviation operations within the study area. Structure heights will average approximately 75 ft, depending upon structure location. According to Federal Aviation Regulations, Part 77 (FAA, 1975), notification of the construction of the proposed transmission line would be required if structure heights exceed the height of an imaginary surface extending outward and upward at a slope of 100 to 1 for a horizontal distance of 20,000 ft from the nearest point of the nearest runway of a public or military airport having at least one runway longer than 3,200 ft. Although there are no public or military airports within the study area, Winston Field, west of Snyder, is within 20,000 ft of all three alternative routes on Segment B. However, preliminary calculations by EH&A indicate that the FAA criteria will not be met and notification of construction will not be required.

4.5.4 Aesthetics

Aesthetic impacts, or impacts upon visual resources, exist when the ROW, lines and/or structures of a transmission line system create an intrusion into, or substantially alter the character of, an existing scenic view. In the case of natural scenic areas, the significance of the impact is directly related to the quality of the view, or in the case of valued community resources and recreational areas, the importance of the existing setting in the use and/or enjoyment of an area.

In order to evaluate aesthetic impacts, field surveys were conducted to determine the general aesthetic character of the area and the degree to which the proposed transmission line will be visible from selected areas. These areas generally include those of potential community value; churches, schools, hospitals, cemeteries, etc.; parks and recreational areas; particular scenic vistas encountered during the field survey; and U.S. and state highways which traverse the study area. Measurements were made to estimate the length of each alternative route that will fall within recreational or major highway foreground visual zones (one-half mile, unobstructed by terrain, vegetation, or other structures). The determination of the visibility of the transmission line from various points was calculated from USGS maps and aerial photographs.

Construction of the proposed 69-kV transmission lines may have both temporary and permanent aesthetic effects. Temporary effects will include views of the actual construction (assembly and erection of the structures) and any clearing of the ROW. Where limited clearing is required in wooded areas, the brush and wood debris may have a temporary negative impact on the local visual environment. Permanent impacts from the project will be the views of the structures and lines themselves

as well as views of cleared ROW. Since the major portion of each of the alternatives occurs in areas of cropland, clearing will be minimal and any resultant aesthetic impacts insignificant.

As stated in Section 3.7.4, the study area exhibits a generally low to moderate level of aesthetic quality in an area that presents an intensive level of agricultural development and landscape modification. There are no designated scenic views or scenic drives located within the study area. The flat topography and the general absence of woodlands throughout much of the area creates a landscape with a generally low level of visual closure, i.e., there is a lack of prominent features to frame or set off any particular view.

4.6 IMPACTS ON CULTURAL RESOURCES

Any proposed construction activities have the potential for adversely impacting cultural resources if any are located within or immediately adjacent to the proposed route. These impacts may occur when an undertaking alters the integrity of location, design, setting, materials, workmanship, feeling, or association of the property that contribute to its significance. Impacts may be direct or indirect. Direct impacts are caused by the undertaking and occur at the same time and place as the construction activities. Indirect impacts include those caused by the undertaking that occur later in time or are further removed in distance but are reasonably foreseeable. These indirect impacts may include alterations in the patterns of land use, changes in population density, or accelerated growth rate, all of which may have an impact on properties of historical, architectural, archaeological, or cultural significance.

As discussed in 36CFR800, adverse impacts on National Register listed or eligible properties may occur under conditions which include, but are not limited to:

1) destruction or alteration of all or part of a property;
2) isolation from or alteration of the property's surrounding environment (setting); or
3) introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting.

4.6.1 Direct Impacts

No recorded cultural resource properties will be directly impacted by the construction of the proposed transmission line. However, unrecorded archaeological or historic sites potentially located

along or near any of the proposed routes could be impacted by construction activities or by increased vehicular and pedestrian traffic in the area during the construction phase of the project. Additionally, the historic context of any unrecorded, significant historic structures could also be compromised by the construction of the proposed transmission lines and towers.

4.6.2 Indirect Impacts

Construction of the proposed transmission line may cause indirect impacts to cultural resource sites located within or near the study area through increased vehicular and pedestrian traffic. Traffic generated by maintenance activities may lead to damage or vandalism since they are more accessible to vandals. The integrity of historic sites and landscapes might be adversely impacted by the visibility of the transmission towers and lines.

4.6.3 Mitigation

The preferred form of mitigation on cultural resources is avoidance. An alternative form of mitigation of direct impacts can be developed for archaeological and historical sites with the implementation of a program of detailed data retrieval. Additionally, relocation may be possible for some historic structures. Indirect impacts on historic properties and landscapes can be somewhat lessened through careful design considerations and landscaping.

4.6.4 Summary of Cultural Resource Impacts

Eight alternative routes were evaluated for Segment A, the Roby to Plainview portion of this project. A total of 16 links, in various combinations, make up the eight routes. The longest route is Route 2A with a length of 149,650 ft (28.34 miles) and the shortest route is Route 7A which is only 141,100 ft (26.72 miles) in length.

Four alternative routes were evaluated for Segment B, the SN TX to 37th Street portion of the project. These routes are made up of various combinations of eight links. The longest route evaluated is Route 4B, with a length of 18,700 ft (3.54 miles), followed by Route 1B, which is 18,600 ft (3.52 miles) long, Route 2B, which is 18,400 ft (3.48 miles) long, and finally Route 3B, which has a length of 16,900 ft (3.20 miles).

Records review at the Texas Archaeological Research Laboratory and the Texas Historical Commission in Austin revealed no previously recorded cultural resources the study area. Therefore, proximity to known cultural resources was not given consideration during the evaluation of the routes. The criterion utilized to select the preferred route, from a cultural resources perspective, was the length of the route thought by EH&A archaeologists to have a high probability for the occurrence of cultural resource sites.

Locations identified by EH&As archaeologists as being high probability areas (HPAs) for the occurrence of prehistoric sites include stream confluences, upland knolls overlooking drainages, and alluvial terraces. Some of these terraces may have the potential for deeply buried sites. Historic sites would most likely occur along historic roadways.

For Segment A, Route 2A is the preferred route from a cultural resources perspective since it crosses the least amount of areas designated as HPAs, approximately 26,050 ft. Two routes (1A and 8A) are tied for the second choice. These two routes each contain 29,150 ft of HPAs. Route 6A is the next choice with about 34,200 ft of HPAs. The fourth and fifth choices are Route 5A and 4A, with 35,400 ft and 38,350 ft of HPAs, respectively. The sixth preferred route is Route 3A. Route 3A contains approximately 39,550 ft of HPAs. Finally, the least preferred route is Route 7A, which contains about 42,900 ft of areas designated HPAs.

For Segment B the preferred route is Route 3B. This route crosses only about 8,650 ft of area identified as HPA. The second and third choices are Route 2B, with 9,450 ft of HPAs, and Route 4B, with approximately 10,050 ft of HPAs. Route 1B, with approximately 10,850 ft of HPA is the least preferred route from a cultural resources perspective.

5.0 AGENCY CORRESPONDENCE

5.0 CORRESPONDENCE WITH AGENCIES/OFFICIALS

The following local, state, and federal agencies and officials were contacted by letter in June and September, 1996 by EH&A and WTU to solicit comments, concerns, and information regarding potential environmental impacts, permits, or approvals for the construction of a 69-kV transmission line in Fisher and Scurry counties. Maps of the study area were included with each letter. Sample copies of EH&A's letters and responses received as of 15 November 1996 are included in Appendix A.

- Texas Natural Resource Conservation Commission (TNRCC)
- Texas Department of Transportation (TxDOT)
  - Aviation Division
  - Environmental Affairs Division
- Texas Water Development Board (TWDB)
- Texas Parks and Wildlife Department (TPWD)
  - Wildlife Division
  - Texas Biological and Conservation Data System (BCD)
- Federal Aviation Administration (FAA)
- Federal Emergency Management Agency (FEMA), Region 6
- Texas Historical Commission (THC)
- U.S. Fish and Wildlife Service (FWS)
- Natural Resource Conservation Service (NRCS)
- U.S. Army Corps of Engineers (USCE)
- U.S. Environmental Protection Agency, Region 6
- National Park Service
- Fisher County Judge
- Fisher County Commissioners
- Roby Mayor
- Roby City Manager
- West Central Texas Council of Governments
- Scurry County Judge
- Scurry County Commissioners
- Snyder Mayor
- Snyder City Manager
- Snyder Floodplain Administrator

As of 15 November 1996, written replies were received from the following agencies/offices: FWS, TPWD - Wildlife Division and BCD, TNRCC, U.S. Army Corps of Engineers, TxDOT -Environmental Affairs Division, THC, NRCS, FEMA, and FAA.

The FWS stated that there are no federally listed threatened, endangered, or candidate species known to occur in Fisher or Scurry counties. Recommendations were made that proposed routes be designed to avoid/minimize impacts to wetlands and riparian corridors. The Service also stated that the Environmental Assessment for the project should include qualification and quantification of all impacts to fish and wildlife resources.

TPWD's Wildlife Division reported there were no known occurrences of special species or natural communities in the immediate vicinity of the transmission line facilities in Fisher and Scurry counties. TPWD also stated that if appropriate habitats were available, the following species may occur: federal and state endangered; Texas poppy-mallow (*Callirhoe scabriuscula*), state threatened; Texas horned lizard (*Phrynosoma cornutum*) and species of concern; western burrowing owl (*Athene cunicularia hypugaea*). The department also stated that wooded or partially wooded riparian creek corridors and upland woods or brush were important wildlife habitats and should be avoided or spanned by line routes. TPWD's Biological and Conservation Data System also provided the incomplete list of rare vertebrates for Scurry and Fisher counties.

TNRCC responded with concern for runoff water from the project and urged the use of construction and post-construction water quality protection practices. Since the proposed project is located in Fisher and Scurry counties, Texas, which is unclassified or in attainment of the National Ambient Air Quality Standard (NAAQS) for all six criteria air pollutants, general conformity does not apply. TNRCC stated that the construction poses no significant impact on air quality standards and the minimal dust particulate emissions during construction can easily be controlled with dust mitigation techniques by the construction contractor.

The U.S. Army Corps of Engineers reported that they are unable to determine from the information whether Department of the Army authorization will be required but that there were several areas subject to Section 404 regulation. If a Department of the Army permit is required, the project may not begin until one is obtained but the project may be authorized by one or more nationwide permits. The Department also suggested that impacts to wetlands and other waters of the United States be avoided or minimized in the planning of the project.

TxDOT's Environmental Affairs Director contacted Area Engineers in both Fisher and Scurry counties and concluded there would be no problem with the proposed project. TxDOT note that 37th Street in Snyder is scheduled for widening in 1999 but that no new ROW will be required for the proposed project.

TxDOT's Aviation Division responded with no comments concerning the environmental aspects of the proposed project. Two public use airports are shown on aeronautical charts to be inside or within 20,000 ft of the study area boundaries and have runways more than 3,200 ft in length. This requires that if the proposed transmission line, poles, or wires extended between the poles, meet the criteria of listed requirements, an FAA "Notice of Proposed Construction or Alteration" would need to be submitted.

THC reported that an archeological survey may be warranted for portions of the project that do not follow existing transmission line ROWs or easements. An antiquities permit application will be necessary if any alternative routes are located within public property. The request that when alternative routes are selected that they be plotted on USGS topographic maps and submitted for review.

NRCS stated that this project will have no significant adverse impacts on agricultural lands.

FEMA reported that neither Fisher nor Scurry counties are currently participating in the National Flood Insurance Program (NFIP). Therefore no federal requirements for floodplain management exist. Special flood hazard areas have been identified on the Flood Hazard Boundary Map (FHBM) for Scurry County dated May 10, 1978, and the recommendation was made to contact local officials to determine any special flood hazard requirements.

FAA provided a Form 7460-1, "Notice of Proposed Construction or Alteration" for review in the event the transmission line towers meet the established criteria. Presently they are unaware of any particular environmental concerns that would require FAA involvement in this project.

Other agencies/offices that responded either had no comments, stated that the proposed project would have no significant impacts in their area of regulation, or stated that they would have more comments when the exact route is delineated. Copies of all correspondence received as of 15 November 1996 are included in Appendix A of this report.

6.0 PREFERRED ROUTE SELECTION

6.0 PREFERRED ROUTE SELECTION

The purpose of this study was to evaluate alternative routes for WTU's proposed Snyder to Roby 69-kV transmission line between the Roby Substation and the Plainview Substation (Segment A) and between the proposed SN TX Substation and the 37th Street Substation (Segment B), located in Fisher and Scurry counties, Texas, and recommend least-impacting routes to WTU.

Following the two public open-house meetings held in the study area, EH&A completed the environmental analysis of the eight primary alternative routes for Segment A and the four primary routes for Segment B (Section 4.0), and presented the results (tables 6-1 and 6-2), a summary of the environmental evaluation, and a recommendation of preferred routes to WTU. The environmental evaluation was a comparison of alternatives from a strictly environmental viewpoint, based upon the measurement of environmental criteria and the consensus opinion of EH&A's group of evaluators. EH&A's evaluation is discussed below. WTU subsequently conducted an evaluation of environmental, land use, engineering, and cost factors, reviewed public input received at the open-house meetings, and then selected preferred routes for each segment, as presented in Section 6.2.

6.1 EH&A'S ENVIRONMENTAL EVALUATION

EH&A professionals with expertise in different environmental disciplines (wildlife biology, land use/planning, and archaeology) evaluated the alternative routes for each segment based upon environmental conditions present along each route (augmented by aerial photo interpretation and field surveys, where possible). Each EH&A staff person independently analyzed the routes and the environmental data presented in tables 6-1 and 6-2. The evaluators then met as a group and discussed their independent results. The relationship and relative sensitivity among the major environmental factors were determined by the group as a whole. The group then selected a preferred route based strictly upon the environmental data.

Because of the undeveloped nature of most of the study area, the relative homogeneity of land uses, and the lack of any critical environmental constraints, EH&A felt that each of the primary routes for both segments (A and B) were environmentally acceptable alternatives for this project. The final evaluation thus considered specific advantages and disadvantages of each route.

TABLE 6-1

ENVIRONMENTAL DATA FOR
TRANSMISSION LINE EVALUATION
SNYDER-ROBY 69-KV PROJECT
SEGMENT A (ROBY-PLAINVIEW)

CRITERIA	ALTERNATIVE ROUTES							
	1A	2A	3A	4A	5A	6A	7A	8A
LAND USE								
Length of alternative route	148,200	149,650	145,800	147,250	142,650	144,100	141,100	148,050
Number of habitable structures[1] within 200 ft of ROW centerline	21	32	15	26	14	25	12	20
Length of ROW parallel to existing ROW (transmission line, pipeline, roads, etc.)	135,000	139,650	92,450	97,100	114,250	118,900	49,450	140,500
Length of ROW through recreational areas	0	0	0	0	0	0	0	0
Number of parks and/or recreational areas within 1,000 ft of ROW centerline	4	4	3	3	3	3	2	4
Length of ROW through cropland	90,400	95,250	78,100	82,950	72,700	77,550	89,500	85,200
Length of ROW through grazingland/rangeland	42,400	42,400	56,500	56,500	57,200	57,200	41,900	63,800
Length of ROW through irrigated pasture or cropland	0	0	0	0	0	0	0	0
Length of ROW across prime farmland soils	69,450	71,450	71,630	73,630	59,850	61,850	73,800	68,350
Length of ROW across gravel pits, mines, or quarries	0	0	0	0	0	0	0	0
Number of pipeline crossings	5	5	5	5	5	5	5	5
Number of transmission line crossings	0	0	0	0	0	0	0	0
Number of U.S. and State highway crossings	11	11	7	7	7	7	1	9