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County's population increased approximately 25%. According to TSDC estimates, Wood County is projected to show a 9.3% gain in population by 2010, a rate much lower than the projected 15.9% increase for the State of Texas. Growth in Wood county over the next 30 years is expected to increase gradually and by 2040, Wood County is projected to reach a population of 44,841 (TSDC, 2004).

3.7.2 Employment

As shown on Figure 3-5, the Civilian Labor Force (CLF) within Wood County and the State of Texas has increased steadily with the increase in population since 1980. Recent TWC employment figures for Wood County show a CLF of 14,599 employees in January 2004, up slightly from 13,899 employees in January 2000 (TWC, 2004a). Between 1980 and 1990, the Wood County CLF grew at a rate of 2%; however, this upward trend declined from 1990 to 2000 with just a 1% annual increase in employment. Unemployment rates in Wood County were 5.4% in January 2004, which was up 0.3% from January 2000 (5.3%) (TWC, 2004a). The State of Texas also had an increase in unemployment rates of approximately 1.9% between January 2000 and January 2004.

Covered employment data incorporate jobs that are located in the county and include workers covered by state employment insurance and most agricultural employees. The data exclude employment covered by the Railroad Retirement Act, self-employed persons, and unpaid family workers. As shown in Figure 3-6, a comparison of third-quarter TWC employment figures for 1998 and 2003 for Wood County reveals a decrease of approximately 3% in the total number of jobs, while the total number of jobs statewide increased approximately 4% during the same 5-year time period (TWC, 2004b).

3.7.3 Leading Economic Sectors

Leading overall employment sectors within Wood County in terms of total employment are Government (1,731 employees); Trade, Transportation, and Utilities (1,682 employees); and Education and Health Services (1,216 employees) (TWC, 2004b).

3.7.4 Community Values

The term "community values" is included as a factor for the consideration of transmission line certification under Section 37.056(c)(4) of the Texas Utilities Code. For the purposes of evaluating the effects of the proposed transmission line, PBS&J 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 that 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.

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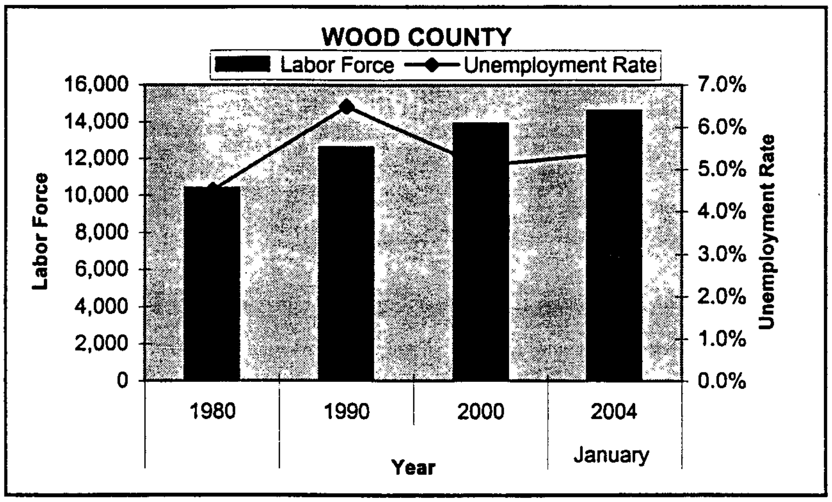
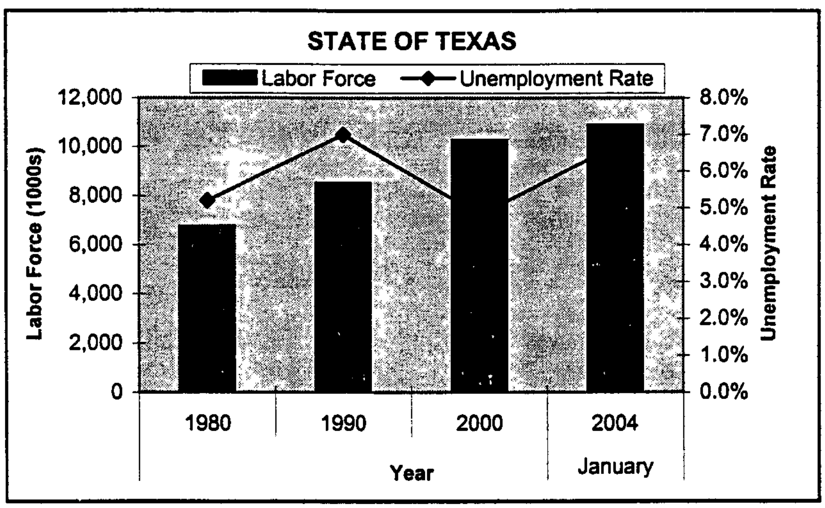
FIGURE 3-5

CIVILIAN LABOR FORCE AND UNEMPLOYMENT RATE





Source: TWC (2004a)

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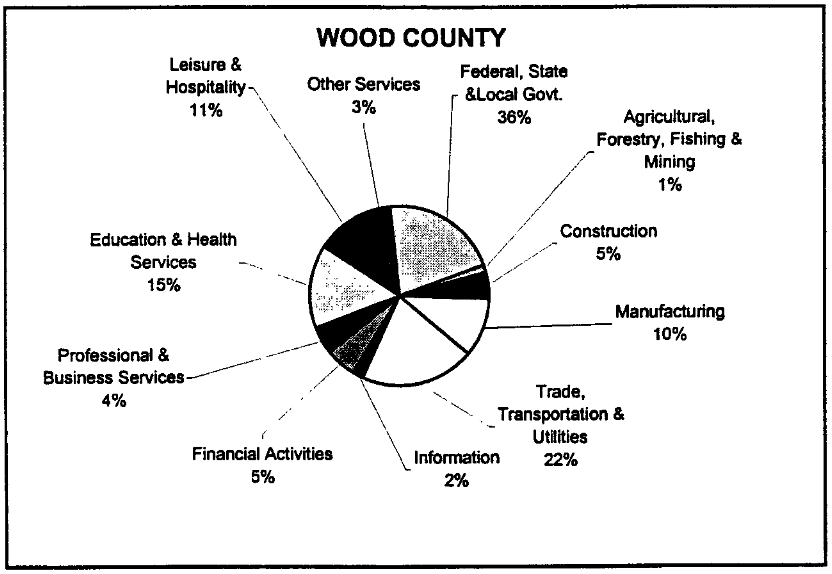
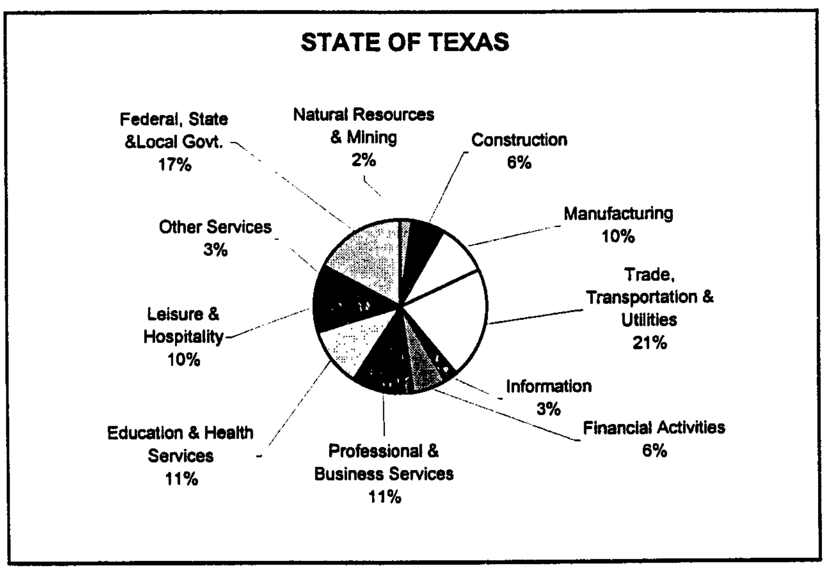
FIGURE 3-6

COVERED EMPLOYMENT AND MAJOR EMPLOYMENT SECTORS
3RD QUARTER 2003





Source: TWC (2004b)

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3.8 HUMAN DEVELOPMENT

3.8.1 Land Use

Land use in Wood County is devoted primarily to forestry, cattle production and cropland. The latest available land use estimates (1992) show Wood County to be about 36% pastureland and 45% forestland (NRCS, 1992).

Residential areas are primarily single-family, owner-occupied housing, but include some rental property. Lake Fork Reservoir, which occupies a large portion of the study area, is important to the economy of the local communities. Lake Fork offers a variety of recreational opportunities and is known as one of the nation's top bass fishing lakes.

3.8.2 Parks and Recreation

A review of the Texas Outdoor Recreation Plan (TPWD, 1984), the Texas Outdoor Recreation Inventory (TPWD, 1990), and the results of several field visits revealed many parks and recreational facilities in the study area and vicinity along Lake Fork Reservoir. Numerous RV parks, camping grounds, public boat ramps and marinas, and licensing facilities provide access and provisions for recreational bass fishing. Recreation activities available at these facilities include fishing, boating, sailing, swimming, hunting, camping, and dining. No state or federal parks or recreational areas lie within the study area boundary.

3.8.3 Transportation/Aviation

A review of the Dallas-Ft. Worth Sectional Aeronautical Chart (Federal Aviation Administration (FAA), 2003a), the Airport/Facility Directory for the South Central U.S. (FAA, 2003b), TxDOT's Texas Airport Directory (TxDOT, 2001), and aerial photography revealed two airports in the vicinity of the study area. Both are registered airfields with the FAA and are located approximately the same distance from the study area. They are the Mineola-Wisener Airport, located on U.S. 80 approximately 25 miles southeast of the study area boundary and the Sulfur Springs Municipal Airport, located on SH 19, about 24 miles northeast of the study area. Two privately owned and operated landing strips are located just outside the study area; Martin's Meadows is approximately 3.7 miles northwest of the Yantis Substation and the other one is 2 miles south of Quitman. Currently, no new airport construction projects are planned by the TxDOT Division of Aviation within 20,000 ft of the study area (TxDOT, 2001).

3.9 AESTHETICS

Aesthetics is included as a factor for consideration in the evaluation of transmission facilities in Section 37.056(c)(4) of the Texas Utilities Code. The term aesthetics refers to the subjective perception of natural beauty in the landscape by attempting to define and measure an area's scenic qualities. Potential aesthetic impacts is an issue of increasing concern to both the public and governmental bodies dealing with siting and approving new transmission facilities. Consideration of the visual environment includes a determination of aesthetic values, where the major potential effect of the project on the resource is considered aesthetic, and recreational values, where the location of a transmission line could affect the scenic enjoyment of a recreation area.

PBS&J's aesthetic analysis deals primarily with potential visual impacts to the public. Viewsheds or scenic areas visible from roads, highways, or publicly owned or accessible lands (parks or privately owned recreation areas open to the public, for example) are analyzed. Several factors are taken into consideration when attempting to define the sensitivity, or potential impact, to a scenic resource from the construction of the proposed transmission line. Among these are:

- 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

Based on these criteria, PBS&J is of the opinion that the study area exhibits a moderate to high degree of aesthetic quality for the region, whether within the predominantly agricultural and timberlands or along the shores of Lake Fork Reservoir. Heavily wooded areas provide variety and contrast to the pleasant pastoral views of the in the agricultural portions of the study area.

Landscapes with water as a major element, such as rivers, lakes, and reservoirs, are often considered to represent high aesthetic values as well. The serenity provided by Lake Fork Reservoir, which comprises a fair portion of the study area, contrasts the alteration and development of the surrounding area.

TxDOT has mapped 10 separate Travel Trails throughout Texas to provide travel routes through different areas of the state, highlighting natural, cultural, and scenic attractions. These routes are described in pamphlets distributed by TxDOT offices and tourist information centers, and marked by special signs along designated highways (TxDOT, n.d.). In 1998, TxDOT published a list of some of the best "Scenic Overlooks and Rest Areas" in Texas, each of which presented particularly strong aesthetic views or settings (TxDOT, 1998). A review of these publications revealed no designated scenic highways or scenic overlooks within any portion of the study area.

In summary, although portions of the study area are aesthetically pleasing, the landscape does exhibit a moderate level of impact from human development including residential subdivisions, roadway bridges, and electrical transmission lines that span Lake Fork Reservoir.

3.10 CULTURAL RESOURCES

The study area is located in the Northeast Texas Archeological Region of the Eastern Planning Region of Texas, as indicated in Figure 3-7 (Mercado-Allinger et al., 1996). Cultural developments in this region are classified by archaeologists according to four primary chronological and developmental stages: Paleoindian, Archaic, Late Prehistoric, and Historic. These classifications have been defined primarily by changes in material culture over time, as evidenced through information and artifacts recovered from archaeological sites.

3.10.1 Cultural Background

Paleoindian occupations in east Texas are primarily known by isolated finds of diagnostic projectile points. The distribution and types of artifacts indicate that these groups were highly mobile and practiced a seasonal round of hunting and gathering (Story, 1990). Social organization probably consisted of loosely structured social groups composed of several nuclear families referred to as bands. *Clovis* and *Folsom* point types are generally thought to be representative of the earlier part of the Paleoindian period, and point types such as *Dalton*, *San Patrice*, *Scottsbluff*, and *Plainview* are thought to represent the later part of the period. During the late Paleoindian period, the population appears to have increased in Texas, probably as a result of the development of localized cultural patterns (Hester, 1976). Evidence exists of the migration of Plains populations into the Eastern Woodlands during this time. Johnson (1989) developed the hypothesis that these people were migrating as a result of drought and its subsequent effect on Plains fauna. Site 41WD40 (Alum Creek Site) in Wood County has yielded 13 whole or fragmented Paleoindian points. The site is located on a remnant upland knoll near the confluence of Alum Branch with Lake Fork Creek.

Little is known about the Early Archaic period except that it appears to have been a transitional period from late Paleoindian to Archaic lifeways. Settlements were apparently still small and groups were still highly mobile. During the Middle Archaic, sites were preferentially located along major streams and tributaries to facilitate hunting and gathering activities (Perttula and Gilmore, 1988). Less non-local lithic material was used at this time, which may indicate that either interaction with other groups had decreased or their mobility had decreased (Story, 1990). Middle Archaic diagnostic projectile points include *Evans*, *Morrill*, and *Neches River*. From the Middle to the Late Archaic, the population probably increased and settlement systems became more complex and sedentary. Projectile points typical at Late Archaic sites include *Elam*, *Edgewood*, and *Gary* types (Newell and Krieger, 1949; Ford and Webb, 1956; Davis and Davis, 1960; Shafer, 1968).

The Early Ceramic period is characterized by the appearance of ceramics. These include sandy paste wares such as *Williams Plain* and decorative motifs identified as *Marksville* and *Troyville* (Perttula et al., 1989). The decorative motifs indicate that Woodland occupations were at least partially influenced by the cultures of the Lower Mississippi River Valley. Sites of the Early Ceramic period in the region tend to be small and relatively permanent. Maize has been found at two sites in Lake Fork Reservoir in Wood

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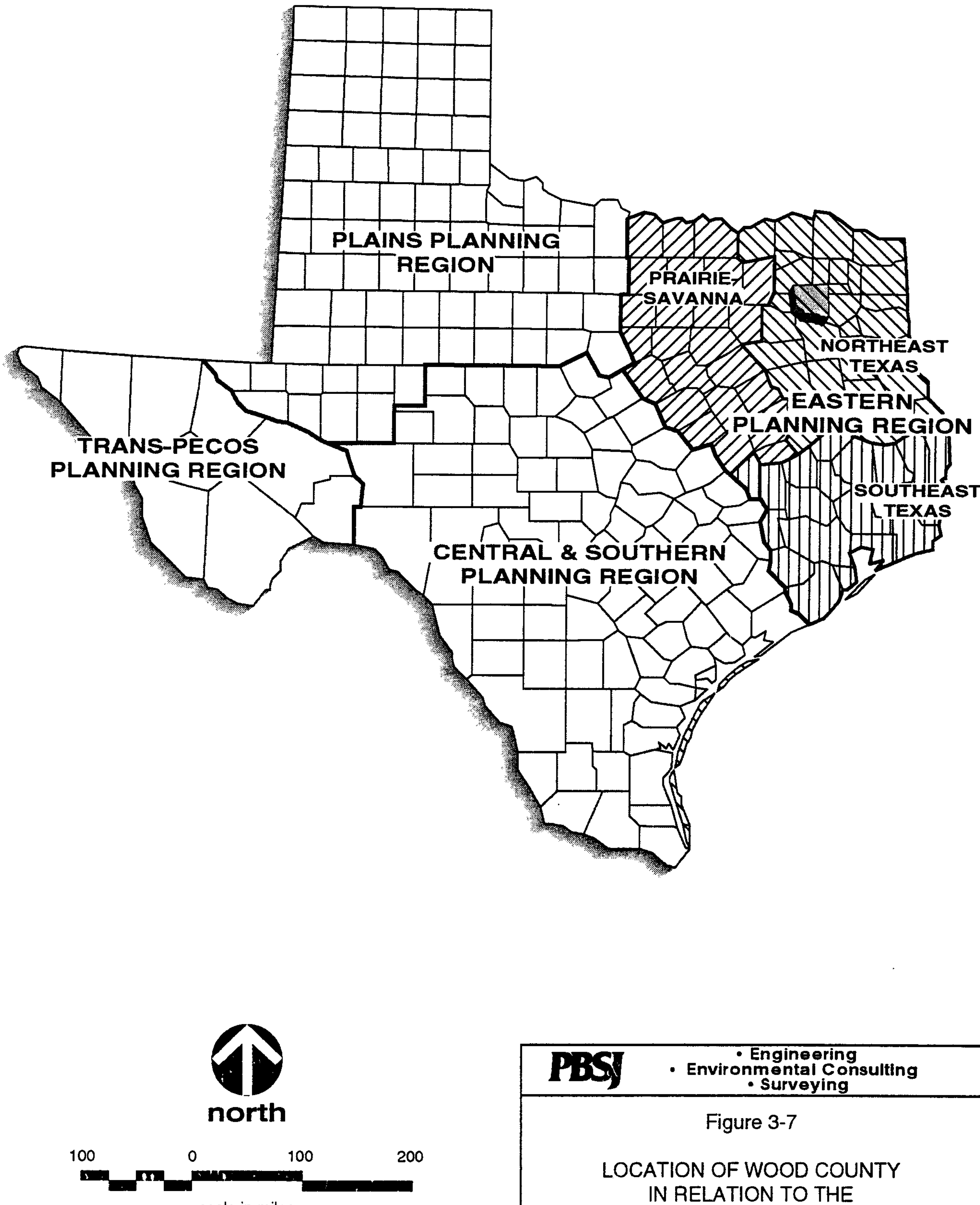

Source: Mercado-Allinger et al. (1996)

PBSJ
• Engineering
• Environmental Consulting
• Surveying

Figure 3-7

LOCATION OF WOOD COUNTY IN RELATION TO THE CULTURAL RESOURCES PLANNING REGIONS OF TEXAS

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County; however, it probably was not heavily relied upon until the Middle or Late Caddoan period. The bow and arrow were introduced during this period (Story, 1990). Projectile points diagnostic of the Early Ceramic period include *Gary* and, possibly, *Friley* types (Perttula et al., 1989).

Late Prehistoric Caddoan culture is generally believed to begin at about A.D. 800. Sites of this period are common in this region, especially on major streams and minor tributaries. During this time, more-productive varieties of maize evolved and became integral to subsistence (Story, 1990). Hunting, fishing, and gathering were still important and populations were concentrated near arable soils and perennial freshwater sources (Perttula and Gilmore, 1988).

This region of east Texas was witness to some of the earliest Spanish and French explorations. It was not until the middle of the nineteenth century, however, that sustained Anglo occupation of the area occurred. Wood County was occupied by tribes belonging to the Caddo confederacy at the time of Anglo immigration into the area. Pedro Vial made the first recorded visit by a non-native explorer in August 1788 while passing between Natchitoches and San Antonio (Tyler, 1996). The first settler was Martin Varner who took up residence in 1824. The first town, Webster, was created in 1850. The county was created in 1850 from portions of Van Zandt County and the county seat was soon established in Quitman. Cattle was an important early industry and, with the construction of railroads across the county, lumbering increased. Specialized farming became popular by the early twentieth century and winter vegetables, fruits, potatoes, corn, and cotton were grown. Wood County remained a rural and agricultural economy until the early 1940s when oil was discovered in the county. The population decline that had occurred during the depression years of the 1930s was reversed with the success of the oil and related industries (Tyler, 1996). Currently, Wood County depends on the oil and cattle industries, which are supplemented by tourism and light-scale manufacturing.

3.10.2 Previous Archaeological Investigations

The history of archaeological research in and around the study area is extensive. Investigations were conducted in the vicinity as early as the 1930s by A.T. Jackson of the University of Texas, primarily in the Dry Creek and Lake Fork Creek basins, north of the Sabine River (Wilson and Jackson, 1930; Reese, 1931). Jackson's fieldwork was concentrated around Quitman, and resulted in the identification of 82 sites in Wood County, 11 of which were concurrently excavated or trenched (Perttula and Gilmore, 1988).

In the late 1950s, R. Turbeville, an avocational archaeologist, excavated a number of Caddoan cemetery and midden sites (Skiles et al., 1980; Perttula and Gilmore, 1988). Southern Methodist University (SMU) undertook extensive archaeological investigations at the proposed Lake Fork Reservoir along Lake Fork Creek in 1975 (Bruseth et al., 1977; Bruseth and Perttula, 1980, 1981). These investigations encompassed portions of Wood, Rains, and Hopkins counties.

One of the largest surveys conducted in this part of east Texas was done along Mill Race Creek and its tributaries. The survey encompassed about 600 acres and was conducted to locate and evaluate protohistoric and early historic sites relating to a possible French trading post called *Le Dout* and to the Woldert Site (41WD333). The trading post was not found, but 39 sites and 32 localities representing prehistoric, protohistoric/early historic, and historic occupations were recorded. Twenty-one of these sites were considered, by the authors, as potentially eligible to the National Register of Historic Places (NRHP) or as State Archeological Landmark (SAL) sites. A Middle and Late Caddoan site on Mill Race Creek was tested by Sam Whiteside (Perttula and Gilmore, 1988).

A review of reports on file at the Texas Historical Commission (THC) revealed that most of the recent investigations in the area have been conducted in response to proposed earth-moving activities, such as construction of oil well pads, gas pipelines, and reservoirs. Several small-scale surveys have been conducted of natural gas well pads and access roads in Tyler State Park (Corbin, 1985, 1991). Turpin recorded no cultural resources for this area during a survey conducted for three proposed pipelines in Tyler State Park (Turpin, 1993).

In general, the area has been subjected to intensive previous investigations, most of which are associated with the Cooper Lake Reservoir. Moorman and Jelks (1952) began investigations at Cooper Reservoir in 1951. They recorded 24 prehistoric sites ranging from Archaic to Late Caddoan. Two of the sites contained flexed burials that were subsequently excavated by the Dallas Archeological Society (Hatzenbuehler, 1953; Harris, 1955). Later, investigations by Duffield and Davis included reassessment of previously recorded sites and recommendation of excavations at Site 41DT2, the Miller Site (Duffield, 1959). Excavations at the site revealed burials that reportedly date to the Archaic period. Early Ceramic and Early Caddoan components were also identified at the Miller Site (Johnson, 1962).

Between 1970 and 1976, SMU conducted large-scale investigations at the Cooper Lake Reservoir. Hyatt and Skinner (1971) recorded 105 sites and conducted limited testing on five of these sites. Evidence of Archaic and Caddoan occupation was found during these investigations. Additional SMU investigations in Hopkins County recorded an additional 25 sites dating from the Late Archaic to Early Caddoan periods (Hyatt et al., 1974; Hyatt and Doehner, 1975; Doehner and Larson, 1978). The next series of investigations began about 10 years later as the construction of the dam was nearing. During this phase of investigations, more attention was given to systematic survey, geomorphological study, and recordation of historic sites that were overlooked in earlier studies (Jurney and Bolin, 1993).

In 1990 and 1991, Gadus et al. (1991, 1992) tested and excavated a number of sites in the Cooper Lake Region, ranging from Woodland through Middle Caddoan. Several of these were multi-component sites. These and other excavations in the study area indicate that settlements became more permanent and populations more dense beginning with the Woodland and through the early Caddoan periods. However, populations became less dense during the late Caddoan period and settlement strategies became increasingly localized.

Beginning in 1986, the University of North Texas (UNT) conducted several investigations near the dam site and located 27 sites with components representing Late Archaic, Early Ceramic, Early Caddoan, and

Euroamerican periods (Perttula, 1988, 1989a, 1989b; Pertulla and Ramenofsky, 1988). A historic cemetery, the Tucker Site (41DT104), was relocated and reported on by Lebo (1988). In 1989, two studies resulted in the recording of 134 sites containing components ranging from the Middle Archaic to historic times.

More-recent archaeological surveys in Wood County have been conducted for the Lake Fork Pipeline in Wood and Hunt counties (Skinner and Kent, 2000), the Holiday Village Development in Lake Fork (McKay et al., 2000), and for water supply systems (Todd, 2003; Moore, 2003). NRHP testing has been conducted at Site 41WD632 (Cliff and Perttula, 2002) and at sites 41WD468 and 41WD469 by TxDot (Wormser and Strickland, 2003).

3.10.3 Results of the Literature/Records Review

A literature review and records search was conducted for the Yantis-Dallas Pump Station study area. This investigation was designed to determine the density and type of previously recorded cultural resources that might be expected within the study area and to assist in the evaluation of alternative routes to lessen the potential impact to cultural resources.

The cultural resources site files at the THC and the Texas Archeological Research Laboratory (TARL) were reviewed for sites located within or adjacent to the study area. A search was conducted of both published and unpublished NRHP data for sites listed on or determined eligible for inclusion on the NRHP. The list of SALs prepared by the THC was reviewed for sites determined significant by the state. The Historical Marker Program of the THC and the Sawmill Database of the Texas Forestry Museum were also consulted.

The THC list identified eight NRHP-listed properties within Wood County. Three are in the Hainesville vicinity, two in the Quitman vicinity, and one each in the vicinity of Mineola, Hawkins, and Alba. The THC records also identified 14 SAL-designated sites in Wood County. Twelve of these are archaeological sites in Lake Fork Reservoir, two are near Quitman, and one is in the Alba vicinity. Fifty-eight Historical Markers are located in Wood County. Most of these occur in the vicinity of Winnsboro and Mineola; none appears to be in the study area. The TARL records identified 635 previously recorded sites in Wood County as of April 2004. The Sawmill Database of the Texas Forestry Museum identified 50 sawmill locations in Wood County. One of the sawmill locations is listed in the Yantis area.

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NOI	Notice of Intent
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
NWR	National Wildlife Refuge
PUC	Public Utility Commission of Texas
ROW	right-of-way
SAL	State Archeological Landmark
SCS	Soil Conservation Service
SH	State Highway
SNA	State Natural Area
SRA	Sabine River Authority
SWPPP	Storm Water Pollution Prevention Plan
TAMU	Texas A&M University
TARL	Texas Archeological Research Laboratory
TCEQ	Texas Commission on Environmental Quality
TCPA	Texas Comptroller of Public Accounts
TDWR	Texas Department of Water Resources
THC	Texas Historical Commission
THM	Texas Historic Marker
TOES	Texas Organization for Endangered Species
TORI	Texas Outdoor Recreation Inventory
TORP	Texas Outdoor Recreation Plan
TPWD	Texas Parks and Wildlife Department
TSDC	Texas State Data Center
TWC	Texas Workforce Commission
TWDB	Texas Water Development Board
TXBCD	Texas Biological Conservation Data System
TxDOT	Texas Department of Transportation
US	U.S. Highway
USACE	U.S. Army Corps of Engineers
USBOC	U.S. Bureau of Census
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
WCEC	Wood County Electric Cooperative, Inc.

Section 4.0

Environmental Impact of the Alternative Routes

4.0 ENVIRONMENTAL IMPACT OF THE ALTERNATIVE ROUTES

4.1 IMPACT ON NATURAL RESOURCES

4.1.1 Impact on Physiography/Geology

Construction of the proposed transmission line is not anticipated to have a significant impact on the geological features or resources of the area. The erection of structures will require the disturbance/removal of small amounts of near-surface material, but will have no measurable impacts on geological features or mineral resources along any alternative routes. Some economically valuable resources, primarily oil and gas, do occur in the region, but the project will have no significant impact on them. The project will have no significant impact on mineral resources in the study area.

4.1.2 Impact on Soils

The construction and operation of transmission lines normally create very few long-term adverse impacts on soils. The major potential impact from any transmission line construction would be erosion and soil compaction. The hazard of soil erosion is generally greatest during the initial clearing, where necessary, of the ROW.

To provide adequate space for construction activities and to minimize corridor maintenance and operational problems, much of the woody vegetation is generally removed within the ROW. In these areas, only the leaf litter and a small amount of herbaceous vegetation would remain and both would be disturbed by the necessary movement of heavy equipment. The potential for soil erosion is generally greatest during the initial clearing of the ROW, where necessary, especially at stream crossings. The most important factor in controlling soil erosion associated with construction activity is to revegetate areas that have potential erosion problems immediately following construction. Natural succession would revegetate the majority of the ROW. Critical areas such as steep slopes and areas of shallow topsoil may require additional seeding. To maximize the protection of both land and water resources, special care will be exercised when clearing near waterways. Vegetation on the stream banks will be left intact to the extent possible. Revegetation of these areas, if necessary, will take priority over less-critical areas. The ROW will be inspected both during and after construction by WCEC's authorized representatives to ensure that problem erosion areas are identified, and special precautions will be taken to minimize vehicular traffic, particularly over areas with very shallow soils, thereby reducing soil compaction. To further minimize potential impacts to soils, sedimentation and erosion controls such as silt fences, jute matting, and sand bags will be used, subject to the SWPPP. Erosion-control measures will be installed by WCEC prior to any site disturbance, and will be removed after restoration is complete.

Prime farmland soils, as defined by the NRCS, are soils that are best suited to producing food, feed, forage or fiber crops. The U.S. Department of Agriculture (USDA) recognizes the importance and vulnerability of prime farmlands throughout the nation and, therefore, encourages the wise use and conservation of these soils where possible. Although some prime farmlands occur in the study area, minimal impact to these soils is expected. Other than potential construction-related erosion and compaction, 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.

4.1.3 Impact on Water Resources

4.1.3.1 Surface Water

Construction of the proposed transmission line would have little adverse impact on the surface water resources of the study area. Streams to be crossed by the proposed project will be spanned, and no supporting structures will be placed in the streambed of any drainage feature. Potential impacts from any major construction project include siltation resulting from erosion, and pollution resulting from the accidental spillage of chemicals (e.g., fuels, lubricants, solvents, petroleum products, etc.). The removal of vegetation could result in an increased erosion potential of the affected areas, such that slightly higher-than-normal sediment yields may be delivered to area streams during heavy rainfall events. These short-term effects would be minor, however, because of the relatively small area to be disturbed at any particular time, the short duration of construction activities, the preservation of streamside vegetation where practicable, and WCEC's efforts to control runoff from construction areas. In addition, a SWPPP will be prepared for the project, and a NOI will be filed with the TCEQ.

If flowing water is present in any of the creeks to be spanned, construction machinery and equipment will be transported around via existing roads to avoid direct crossings. This should eliminate the necessity of constructing temporary low-water crossings which might result in erosion, siltation and disturbance of the stream and its biota. If a stream to be spanned is dry at the time of construction, some earth may need to be moved to facilitate crossing, but the area should ultimately be restored to preconstruction conditions. Selective clearing (i.e., use of chain saws instead of bulldozing), if necessary at stream crossings, will be undertaken to minimize erosion problems. Highly erodible areas adjacent to streams (stream banks) will not be cleared unless necessary. No long-term adverse impacts are anticipated.

Since the proposed line will cross Lake Fork Reservoir, increased turbidity during erection of the towers would occur. This would be temporary and localized, however. The number of stream crossings ranges from 1 for Route 5 to 5 for routes 3 and 4.

4.1.3.2 Floodplains

While 100-year floodplains associated with Lake Fork Reservoir and its tributaries occur in the study area, little will be crossed by the alternative routes. If it becomes necessary to locate transmission line structures or roads within the floodplain, they will be designed and constructed so as not to impede the flow of water or create any hazard during flooding. Construction of the proposed project should have no significant impacts on the function of the floodplain, nor adversely affect adjacent or downstream property. Route 5 is the only alternative route that does not cross a 100-year floodplain. Routes 1 and 3 cross approximately 600 ft (0.1 mile) of floodplain, while routes 2 and 4 cross approximately 1,200 ft (0.2 mile) of floodplain.

4.1.3.3 Groundwater

The construction, operation, and maintenance of the proposed transmission line are not anticipated to adversely affect groundwater resources in the study area or its vicinity. Potential sources of groundwater impact associated with the proposed project include possible contamination from the accidental spilling of fuels, lubricants, petroleum products, etc. A SWPPP prepared specifically for this project will involve the implementation of best management practices (BMP) that will significantly reduce the risk of sediment and contaminants leaving the ROW. The potential impact to aquifers in the area would also be considered negligible because the transmission line will be erected aboveground rather than being buried. The amount of recharge area disturbed by construction of the line would be considered relatively insignificant compared to the total amount of recharge area available for the aquifer systems in the region. No measurable alteration of aquifer recharge capacity is anticipated to occur.

4.1.4 Impact on Ecosystems

4.1.4.1 Vegetation

The primary impact to vegetation resulting from site preparation and construction of the proposed transmission line would be the removal of existing woody vegetation along the proposed ROW. The amount of vegetation cleared from the transmission line ROW will be dependent upon the type of vegetation present and whether the ROW will be completely new or involve widening existing ROW. For example, the greatest amount of vegetation clearing would occur in wooded areas, whereas pastureland or cropland would require little to no removal of vegetation. Widening an existing ROW would have less of an impact on vegetation than clearing completely new ROW. Areas currently used as rangeland may be temporarily unavailable for grazing for the duration of the transmission line construction, but can usually be returned to previous land uses upon completion of the project construction.

During the vegetation clearing process, efforts will be made to retain native ground cover where possible, and impacts to local vegetation will be minimized. Much of the undeveloped land and pastureland crossed by the alternative routes is covered with low to medium grasses and/or forbs that may or may not require clearing. Clearing of woody vegetation will only occur where necessary to provide access and working space and to protect conductors. Soil conservation practices will be undertaken to benefit native vegetation and to assist in successful restoration of disturbed areas. Depending on landowner preference, the ROW will be reseeded as soon as possible after the construction of the transmission line in native grasses or a cover or forage crop, if necessary, to facilitate erosion control.

Vegetation community types in the study area were determined from recent color aerial photography (March 2004) and verified in the field where possible. The approximate extent of the vegetation communities occurring along the alternative routes was determined by measuring the linear distance from the photography 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 and an ecological survey of the study area. The results of these measurements are presented in Table 6-1 (Section 6.0) and are discussed below.

Of the five primary alternative routes being analyzed, Route 4 crosses the least amount of woodland (approximately 3,350 ft (0.6 mile) of upland and 950 ft (0.2 mile) of bottomland) followed by Route 2 with approximately 3,700 ft (0.7 mile) of upland and 950 ft (0.2 mile) of bottomland, for a total of 4,650 ft (0.9 mile). Although Route 5 crosses the third-most amount of woodland (approximately 5,600 ft (1.1 miles)), it crosses the least bottomland/riparian woodland (approximately 300 ft), which has a higher value for wildlife habitat than upland woodland. Route 5 crosses no potential wetlands (including bottomlands) and routes 2 and 4 the second-least amount of potential wetlands (approximately 800 ft (0.2 mile)). From a vegetation standpoint, therefore, Route 4 is the preferred choice, followed by Route 2, with Route 5 a close third. Route 1 is the least desirable because it crosses the most woodland (approximately 6,350 ft (1.2 miles)) and the most potential wetlands (approximately 1,350 ft (0.3 mile)).

The potential impact to regulatory wetlands was determined from FWS NWI maps. Actual impacts to wetlands can only be determined by conducting field surveys of the respective routes. The greatest potential for the occurrence of wetland habitats along any of the alternative routes is in association with stream/creek crossings, stock ponds, and Lake Fork Reservoir. In most cases, wetlands can be spanned, thus avoiding the placement of structures in these sensitive areas. Route 5 crosses no potential wetlands, while routes 1 and 3 cross the most (approximately 0.2 mile). Impacts to wetlands are expected to be insignificant.

4.1.4.2 Fish and Wildlife

Terrestrial: 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, followed by a discussion of the possible impact of individual alternative routes.

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, and mammals. 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 foxes may avoid the initial clearing and construction activities and move into adjacent areas outside the ROW. 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 regrowth of vegetation in the ROW following construction will minimize the effects of this loss.

Several studies have indicated that forest fragmentation has a detrimental effect on some avian species that show a marked preference for large undisturbed forest tracts (Robbins et al., 1989; Terborgh, 1989). It has been demonstrated that individual species are not randomly distributed with regard to habitat size. Also, area-sensitive species requiring interior woodland habitat are typically more sensitive to fragmentation than edge-adapted species and are particularly affected by predation, brood-parasitism, and other impacts on nesting success (Terborgh, 1989; Faaborg et al., 1992). Migrant passerines nesting within the study area could become vulnerable to nest predation or parasitism by edge species such as the American crow and brown-headed cowbird.

The increased noise and activity levels during construction could potentially disturb breeding or other activities of species inhabiting the areas adjacent to the ROW. Dust and gaseous emissions would minimally affect wildlife. Although the normal behavior of many wildlife species will be disturbed during construction, no permanent damage to the populations of such organisms would result. Periodic maintenance clearing of the ROW, while producing temporary negative impacts to wildlife, improves the habitat for ecotonal or edge species as a result of the increased production of small shrubs, perennial forbs, and grasses. In some areas, the stacking of brush along the borders of the ROW will also serve to increase the edge and provide additional cover for wildlife.

Transmission line structures could benefit some bird species, particularly raptors, by providing resting and hunting perches, particularly in open, treeless, arid habitats (Avian Power Line Interaction Committee (APLIC), 1996). Raptors often utilize the support structures as nesting sites, one of the more common species to do so being the red-tailed hawk. Vultures and ravens are known to use the structures as night-time roosts and the wires and structures are often used as hunting or resting perches by such species as the red-tailed hawk, American kestrel, and mourning dove. By such benefits, transmission lines have significantly increased raptor populations in several areas of the U.S. (APLIC, 1996). The danger of electrocution to birds will be insignificant since the distance between conductors or conductor and structure or ground wire on 69/138-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). Migratory 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; 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).

Power lines within daily use areas are responsible for most bird collisions. Waterfowl species are vulnerable because of their low altitude flight and high speed. Species that travel in large flocks, such as blackbirds and many shorebirds, are also vulnerable, since dense flocks make movement around obstacles more difficult for individuals in the flock (APLIC, 1994).

Several means can be employed to minimize transmission line impacts on birds in flight. The initial placement of a transmission line is the most important consideration (Avery, 1978; APLIC, 1994). The proximity of a transmission line to areas of frequent bird use is crucial. This is especially true for daily use areas (such as feeding areas) or other areas where birds may be taking off or landing regularly (APLIC, 1994). The position of the individual structures can also help reduce collisions. Faanes (1987), in an indepth study in North Dakota, found that birds in flight tend to avoid the transmission line structures, presumably because such structures are visible from a distance. Instead, most appear to fly over the lines in the mid-span region. In areas where the transmission line passes between roosting and foraging areas, the structures can be placed in the center of the flyway (i.e., where the birds are more likely to fly) to increase their visibility, in addition to heavily marking the wires.

Other factors that should be considered in the initial transmission line routing are the height of the surrounding vegetation and the topography of the area (APLIC, 1994). The height of transmission lines relative to the surrounding vegetation can help reduce the probability of collisions. Lines built at the height of the surrounding trees seldom are a problem for forest-dwelling birds, and large birds will avoid the treeline, thus avoiding the transmission line (Thompson, 1978; APLIC, 1994). Topographical features such as valleys, ridges, mountain passes should also be considered, to avoid important flight paths.

Faanes (1987) reported that 97% of birds observed colliding with a power line did so with the ground (shield) wire, largely as a result of trying to avoid the conductors. Beaulaurier (1981) found that removal of the shield wire at two study sites in Oregon resulted in a reduction in collisions of 35% and 69%. However, removal of the shield wire is not considered a safe or reliable option by WCEC.

Increasing the visibility of the wires by using markers such as orange aviation balls, black-and-white ribbons or spiral vibration dampers, particularly at mid-span, will reduce the number of collisions.

Beaulaurier (1981) reviewed 17 studies involving marking ground wires or conductors and found an average reduction in collisions of 45% compared to unmarked lines.

Waterfowl are among the birds most susceptible to wire strikes (Faanes, 1987) and yet, despite these hazards, it has been estimated that wire strikes (including distribution lines) account for less than 0.1% of waterfowl nonhunting mortality, compared to 88% from diseases and poisoning and 7.4% due to the weather (Stout and Cornwell, 1976). In some areas, hunting affects 20 to 30% of waterfowl populations (Thompson, 1978). The overhead line across Lake Fork Reservoir could put waterfowl at risk from collision. Marking the wires would help to reduce the potential for collision.

Potential impacts to other terrestrial wildlife may occur from the destruction of habitat, particularly wooded habitats. Woodland habitats are relatively static environments that require a greater regenerative time compared to pastureland, cropland, grassland, or emergent wetlands.

In general, because vegetation provides habitat for wildlife, the preferred route from a vegetation standpoint is usually also the preferred route from a wildlife standpoint. The greatest potential impact to wildlife from the project would primarily result from the clearing of woodland habitat, crossing bottomland/riparian woodlands and wetlands, and locating the ROW parallel and within 100 ft of streams/creeks. Another important consideration is the length of the line. Even in areas such as cropland or pastureland where little/no vegetation removal would be required, generally the longer the line the more potential for avian collisions.

From a wildlife perspective, Route 5 is the preferred choice, followed by Route 4. Route 5 is the shortest route (approximately 31,225 ft (5.9 miles)), crosses the least amount of bottomland/riparian woodland (approximately 300 ft), crosses no potential wetlands, crosses the fewest streams (1), and does not parallel any streams/creeks. Although it crosses the third-most amount of woodland (approximately 5,600 ft or 1.1 miles), only 300 ft of this is bottomland/riparian woodland, which is more valuable as wildlife habitat than upland woodland. The second choice, Route 4, crosses the least amount of total woodland, the least amount of upland woodland, the second-least amount of bottomland/riparian woodland, and the second-least amount of potential wetlands. Route 1 is the least desirable regarding wildlife because it crosses the most woodland (approximately 6,350 ft or 1.2 miles) and the most potential wetlands (approximately 1,200 ft or 0.2 mile).

Aquatic: Potential impacts to aquatic ecosystems resulting from construction activities could result from physical habitat loss or modification, degrading of water quality, increased erosion, sedimentation, turbidity, increased runoff, mechanical disruption of aquatic habitat, and spillage of petroleum and other chemical products. All of these tend to be short-term effects, however, and will vary with the intensity of construction and location of the preferred route.

Physical habitat loss or modification could result whenever access road crossings intercept a drainage system or through sedimentation due to erosion, increased suspended solids loading, or accidental petroleum spills directly into a creek. Erosion results in siltation and increased suspended solids entering streams/creeks by the transmission line, which in turn may negatively affect many aquatic organisms, notably game fish, that require relatively clear water for feeding and reproduction. Since area streams typically exhibit relatively high turbidities during and following rainfall/runoff events, however, small increases in suspended solids during the construction phase are unlikely to have any discernible adverse impact. The aquatic ecosystems directly affected by the alternative routes are manmade ponds that are dependent on rainfall, streams/creeks, and Lake Fork Reservoir. Alteration of water quality as a result of particulate loading caused by direct mechanical damage from men and equipment operating near creek beds, by clearing of riparian vegetation, and by siltation from erosion in newly disturbed areas could also have effects on downstream areas. Particularly sensitive in this respect are the gravel riffle and sand bottom habitats in the various creek drainages. Blanketing of these areas by fine sediments could eliminate habitats important for fish spawning, resident benthic invertebrates, the aquatic nymphal stages of dragonflies, mayflies and caddisflies, and freshwater mussels. Such impacts would be temporary, however, because higher-than-normal suspended solids loads would cease as areas disturbed by construction become revegetated and any blanketed riffles would be scoured by subsequent runoff.

These impacts will be largely, if not completely, obviated by appropriate construction techniques. No heavy equipment will operate in flowing stream segments. Herbicides or other chemicals will not be used in areas where they might enter the aquatic ecosystems and cause significant adverse impact to the aquatic communities therein. Because the transmission line will span the creeks and stock tanks/manmade ponds, and because erosion controls will be utilized, few impacts, if any, to these aquatic systems are anticipated.

During the construction of the overhead line across Lake Fork Reservoir, increased turbidity and sedimentation would be expected. Disturbance, however, would be restricted to the vicinity of the few towers to be placed in the water. Even with the crossing of Lake Fork Reservoir, impacts to aquatic communities will be relatively insignificant.

Typically, aquatic factors taken into consideration when selecting a preferred route include the amount of potential wetlands crossed, the amount of ROW parallel to and within 100 ft of streams/creeks, the number of stream/creek crossings, and the amount of open water crossed. Wetland areas can usually be spanned. While streams/creeks are also spanned, such crossings could involve clearing the ROW near the bank. Thus, increased sedimentation and turbidity could result during rainfall. Routes parallel to and within 100 ft of a stream/creek could have a similar effect. The Lake Fork Reservoir crossing (Link A) is common to all five routes.

Route 5 represents the least potential impact to aquatic habitat because it makes the fewest stream/creek crossings (1), crosses no potential wetlands, does not parallel any streams/creeks, and crosses the second-least amount of open water (approximately 5,750 ft or 1.1 miles).

Route 1 is the least desirable from an aquatic standpoint largely because it crosses the most potential wetlands (approximately 1,200 ft or 0.2 mile) and the most open water (approximately 6,325 ft or 1.2 miles). Apart from the lake crossing, however, these open-water bodies can be spanned.

Recreationally and Commercially Important Fish and Wildlife Species: Construction of the proposed transmission line is not expected to have significant impacts on terrestrial recreationally and commercially important species occurring within the study area. Furbearers such as the common raccoon, ringtail, Virginia opossum, common gray fox, bobcat, and striped skunk, and game species such as the white-tailed deer, mourning dove, northern bobwhite, fox squirrel, and eastern cottontail are very mobile and will leave the immediate vicinity during the initial construction phase. Wildlife in the immediate area may experience a temporary loss of browse or forage vegetation during construction; however, the prevalence of similar habitats in adjacent areas will minimize the effect of the loss. Similarly, once construction is complete and the line in operation, aquatic species would not be impacted. The lake crossing, however, may cause some inconvenience to fishermen.

4.1.4.3 Endangered and Threatened Species

As noted earlier in this report, the FWS and TPWD were contacted to determine whether the proposed project would affect any federally or state-listed endangered and threatened species, or species proposed for listing. Copies of correspondence with FWS and TPWD are located in Appendix B. No federally/state-listed plant species have been recorded in Wood County; therefore, no impacts are anticipated.

One active and one inactive bald eagle territory occur in the project vicinity. The active territory is approximately 4.5 miles east of the proposed Dallas Pump Station, while the inactive territory is approximately 2.5 miles east of the Yantis Substation (Gregory, 2004). Furthermore, bald eagles overwinter at Lake Fork Reservoir. Therefore, the reservoir crossing may pose a hazard to flying eagles.

No long-term impacts from construction and operation of the proposed transmission line to any of the other federal or state-listed species addressed in Section 3.6.2 are anticipated. In general, the majority of the species that could potentially occur in the study area are highly mobile and either do not normally use local environments or pass through the area only during migration. The interior least tern, white-faced ibis, peregrine falcon, wood stork, and swallow-tailed kite, if they occur in the study area, are likely to do so only as transitory migrants or post-breeding wanderers. While the transmission line structures may pose a hazard for these birds, the normal flying altitudes during migration are greater than the height of the proposed structures. The wires themselves may provide roosting sites for birds passing through the area. Bachman's sparrow is unlikely to occur in the study area.

The Texas horned lizard, northern scarletsnake, timber rattlesnake, and Louisiana pinesnake, if they occur in the ROW, may be impacted to some extent during the initial clearing and construction phases of the project. These impacts would be short term, however, and not expected to be significant. The black bear

(Louisiana subspecies and others) is not expected to occur in the study area and is highly unlikely to be impacted by the project. As noted in Section 3.6.2, no critical habitat occurs in the study area and, thus, no critical habitat will be impacted by the proposed project.

Aquatic species such as the alligator snapping turtle, paddlefish, and creek chubsucker may be subjected initially to disturbance and increased siltation during construction, but such disturbance would be minimal and of short duration. Precautions will be taken to minimize siltation influx into area creeks/streams and the lake. As noted in Section 3.6.2, no critical habitat occurs in the study area and, thus, no critical habitat will be impacted by the proposed project.

4.1.4.4 Summary of Impact on Natural Resources

From an ecological perspective, Route 4 is the preferred alternative route, followed by routes 5 and 2, respectively. Route 4 crosses the least amount of woodland and the second-least amount of potential wetlands. Although Route 5 crosses more woodland than Route 2, it was selected over Route 2 because it crosses less bottomland/riparian woodland (which is more valuable as wildlife habitat than upland woodland), crosses no potential wetlands, crosses the fewest streams, and is the shortest alternative route. Route 1 is the least desirable alternative route from an ecological perspective because it crosses the most woodland and the most potential wetlands.

4.2 IMPACT ON HUMAN RESOURCES

4.2.1 Socioeconomic Impact

Construction and operation of the proposed transmission line would have a positive impact on the local economy. Direct impacts would be confined to the construction phase of the project. A portion of the project wages will find its way into the local economy through purchases such as fuel, food, lodging, and, possibly, building materials. ROW easement payments (or some other method) will be made to individuals whose lands are crossed by the transmission line based on the appraised land value, and this will result in increased income to those landowners. Since WCEC will only require easements for the proposed transmission line, none of this land will be taken off the tax rolls. The cost of permitting, designing, and constructing the line will be paid for through revenue generated by the sale of electrical service.

Potential long-term economic benefits to the community resulting from construction of this project are based on the requirement of electric utilities to provide an adequate and reliable level of electrical transmission and distribution service throughout their service areas. Economic growth and development rely heavily on adequate public utilities, including a reliable electrical power supply system. Without this basic infrastructure, a community's potential for economic growth is constrained.

4.2.2 Impact on Community Values

As noted earlier in Section 3.7.4, community values are included as a factor for the consideration of transmission line certification under Section 37.056(c)(4) of the Texas Utilities Code, although the term has not been specifically defined for regulatory purposes by the PUC. However, in the CCN application for transmission lines, the PUC requests information concerning the following items under the general heading of community values:

- Approvals or permits required from other governmental agencies;
- General description of the area;
- Residences, businesses, schools, churches, hospitals, nursing homes or other habitable structures within 300 ft of the centerline of the proposed project;
- AM, FM, microwave and other electronic installations in the area;
- 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 project; and
- Number of historical and archaeological sites within 1,000 ft of the project.

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

For the purposes of evaluating the effects of the proposed transmission line, PBS&J 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 that 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 that 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 4.2.5 and 4.2.6 of this report.

4.2.3 Impact on Land Use

Land use impacts from transmission line construction are usually determined by the amount of land (of whatever use) displaced by the actual ROW and by the compatibility of electric transmission line ROW with adjacent land uses. During construction, temporary impacts to land uses within the ROW could occur due to the movement of workers and materials through the area. Construction noise and dust, as well as temporary disruption of traffic flow, may also temporarily affect residents and businesses in the area immediately adjacent to the ROW. Coordination among WCEC, contractors, and landowners regarding access to the ROW and construction scheduling should minimize these disruptions.

The primary criteria considered to measure potential land use impacts include proximity to habitable structures (i.e., residences, businesses, schools, churches, hospitals, nursing homes, etc.), overall length, length parallel to existing ROW, and length parallel to apparent property lines.

Generally, one of the most important measures of potential land use impact is the number of habitable structures located in the general vicinity of each route. PBS&J staff determined the number and distance of habitable structures along each route by interpreting aerial photography and conducting field surveys.

Of the five primary alternative routes being evaluated, Alternative Route 4 lies within 300 ft of the fewest habitable structures (3), followed by Route 5 (7), Route 3 (8), and Route 2 (11) (Table 6-1; Section 6.0). Alternative Route 1 lies within 300 ft of the most habitable structures (16). Several of the structures identified within 300 ft of the alternative routes, however, are probably used as weekend or vacation cabins and reflect the importance of recreational fishing within the study area. For example, four of the seven habitable structures that occur along Route 5 are recreational vehicle (RV) trailers with the tires removed, and placed on cinder blocks. Similarly, alternative routes 1 and 2 each pass within 300 ft of a fishing guide service, where four small cabins and one mobile home are located on a small tract of land.

Paralleling existing ROW is generally considered to be a positive routing criterion since it usually results in fewer impacts than establishing new ROW. Routes 1 and 2 lead the alternatives in this regard, with approximately 17% of their lengths paralleling existing ROW. The paralleling of property lines is another generally positive routing criterion. Apparent property lines that occur along existing ROW (e.g., roads) were not included in this category, as the intent was to parallel the ROW and not the property line. Route 5 has the highest percentage (21%) of its length paralleling apparent property lines, followed by Route 4 with 13%.

Finally, the overall length of a particular alternative route can be an indicator of the relative level of land use impacts. Generally, all other things being approximately equal, the shorter the route, the less land is crossed and the fewer potential impacts result. The routes range in length from 5.9 miles (Route 5) to 6.3 miles (Route 2).

4.2.4 Impact on Agriculture

Agriculture (both farming and ranching) is the primary land use within most of the study area and along virtually all of the primary alternative routes. Potential impacts to agricultural land uses include disruption or preemption of agricultural activities. Disruption of farming activities 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 farming activities refers to the actual amount of land lost to production immediately beneath and around the base of the structure. Areas used for grazing (either pasture or range) are generally much less affected by the location of transmission line corridors.

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 impact agricultural land less than H-frame or lattice towers because they present a smaller obstacle and take up less actual acreage at the foundation. 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, no long-term or significant displacement of farming or grazing activities should occur. Most existing land uses may be resumed following construction. No cropland or pastureland irrigated by circle-pivot or other above-ground mechanical means is crossed by any of the primary alternative routes.

Impacts to agricultural lands can generally be ranked by degree of potential impact, with the least potential impact occurring in areas where grazing is the primary use (pasture or rangeland), followed by cultivated cropland, with forested land having the highest degree of potential impact. The amount of each route crossing pastureland ranges from approximately 61% for Route 5 to 70% for Route 4. None of the alternative routes crosses cultivated cropland and no more than 19% of each route crosses woodland. Route 5 is the only route within 2,000 ft of an electronic tower.

4.2.5 Impact on Recreation

Potential impacts to recreational land use include the disruption or preemption of recreational activities. Although parkland and recreational sites occur within the study area, attempts were made to avoid these lands when defining alternative routes. Apart from Lake Fork Reservoir, none of the five primary alternative routes crosses any parks or recreational areas. The Lake Fork crossing, which is common to all five routes, will involve placing several structures in the water. These could prove to be a boating hazard, or at least an inconvenience, for recreational boaters, but may also create desirable fishing holes for fishermen. No routes cross rivers or streams designated by TPWD as floatable.

4.2.6 Impact on Aesthetics

Aesthetic impacts, or impacts on 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, the existing view. The significance of the impact is directly related to the quality of the view, in the case of natural scenic areas, or to the importance of the existing setting in the use and/or enjoyment of an area, in the case of valued community resources and recreational areas.

In order to evaluate aesthetic impacts, field surveys were conducted to determine the estimated length of the proposed transmission line that would be visible from selected publicly accessible areas. These areas included those of potential community value, recreational areas, and particular scenic vistas that were encountered during the field surveys, as well as U.S. and state highways and FM roads that cross the study area. Measurements were made to estimate the length of each alternative route that would fall within recreational, residential, or major highway foreground visual zone (one-half mile, unobstructed by vegetation or topography). The determination of the visibility of the transmission line from various points was calculated from USGS maps and aerial photography, and verified in the field were possible.

Construction of the proposed 69/138-kV transmission line could have both temporary and permanent aesthetic effects. Temporary impacts would include views of the actual assembly and erection of the structures and clearing of the ROW. Where wooded areas are cleared, piles of brush and wood debris could have a temporary negative impact on the local visual environment. Permanent impacts from the project would involve the views of the structures and wires as well as views of cleared ROW.

Overall, apart from the crossing of Lake Fork Reservoir, which is common to all five alternative routes, aesthetic impacts from the construction of this project are not considered to be significant, as many segments of the alternative routes are located on large, undeveloped tracts of land. Approximately 3,000 ft or roughly 9% of alternative routes 1 and 3 will be in the visual foreground of SH 154; routes 2, 4, and 5 are not within the foreground visual zone of any U.S. or state highways. Apart from the Lake Fork crossing, none of these crossings is located in particularly scenic areas or along designated scenic drives. Because the line crosses Lake Fork Reservoir, a recreational area, a large portion of the line will be seen from the lake. Route 5 will be the least visible, while routes 3 and 4 will be slightly more visible than routes 1 and 2.

Table 6-1 in Section 6.0 of this report presents specific data on line visibility for each of the primary alternative routes in each of the categories discussed above. Potential aesthetic impacts from this line have been minimized by locating all alternatives away from cities, towns, and parks and recreation areas wherever possible.

4.2.7 Impact on Transportation/Aviation

Potential impacts to transportation could include temporary disruption of traffic and conflicts with proposed roadway and/or utility improvements, and may include increased traffic during construction of the proposed project. Such impacts, however, are usually temporary and short-term. While no U.S. or state highways are crossed by any of the five primary alternative routes, all five cross FM 515. County road crossings range from three (Route 5) to seven (Route 3). WCEC will acquire road-crossing permits from TxDOT for all state-maintained roads/highways crossed by the proposed transmission line.

No public or military airports are located within the study area nor within 10,000 ft of any of the five alternatives. No private landing strips will be negatively impacted by any route. Thus, aviation will have no bearing on selection of a preferred route.

According to FAA Regulations, Part 77 (FAA, 1975), notification of the construction of the proposed transmission line will 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; or 50 to 1 for a horizontal distance of 10,000 ft from the nearest runway of a public or military airport where all runways are less than 3,200 ft in length. Typical transmission line structure heights will be approximately 70 to 110 ft. According to PBS&J's preliminary calculations, FAA notification will not be required for this project. The proposed transmission line facilities should have little or no effect on aviation operations within the study area.

The proposed transmission line should also have a minimal effect on electronic communications within the study area. No commercial AM radio transmitters are located within 10,000 ft and no FM radio transmitters are located within 2,000 ft of any of the proposed alternatives. One electronic cellular tower, however, is located within 2,000 ft of Route 5.

4.2.8 Summary of Impact on Human Resources

Summarizing the above criteria, Route 5 is the preferred choice from a land use perspective because it is the shortest route, it parallels the greatest amount of apparent property lines (21% of its total length), it would be the least visible of all routes, and along with Route 4, has just three habitable structures located within 300 ft (excluding the four RV-type cabins). Route 4 is the second choice from a land use perspective. It has three habitable structures located within 300 ft, is the third-shortest route, and parallels the second-most amount of apparent property lines (13%). Route 1 (16 habitable structures within 300 ft, second-longest route) and Route 2 (11 habitable structures within 300 ft, longest route) are the least desirable routes.

4.3 IMPACT ON CULTURAL RESOURCES

Any construction activity has the potential for adversely impacting cultural resource sites. The impacts may occur through changes in the quality of the historical, architectural, archaeological, or cultural characteristics of that cultural entity. These impacts may occur when an undertaking alters the integrity of location, design, setting, materials, construction, or association of the property that contributes to its significance according to NRHP criteria.

As discussed in 36 CFR 800, adverse impacts on NRHP-listed or NRHP-eligible properties may occur under conditions that 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.

Impacts may be direct or indirect. Direct impacts to known or unknown cultural resources sites may occur during the construction phase of any proposed project. Direct impacts are caused by the actual construction activities or through increased vehicular and pedestrian traffic during the construction phase. The increase in vehicular traffic may damage surficial or shallowly buried sites, while the increase in pedestrian traffic may result in vandalism of some sites. Additionally, the integrity of the character of any unrecorded, significant historic structures could also be visually impacted by the proposed construction.

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 alteration in the pattern of land use, changes in population density, accelerated growth rates, or increased pedestrian or vehicular traffic, all of which may have an adverse impact on properties of historical, architectural, archaeological or cultural significance. Historical sites and landscapes might be adversely impacted by the visibility of the structures and associated wires.

The preferred form of mitigation for 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 historical properties and landscapes can be lessened through careful design considerations and landscaping.

One of the methods utilized to assess an area for potential cultural resources is to identify high probability area (HPA). When identifying HPA, topographic setting, environment, and the availability or raw material and water resources are all taken into consideration. Generally, when defining HPA, a distance relationship to a water resource is set, which would encompass landforms such as floodplains or alluvial terraces within approximately 650 to 1,000 ft of any perennial and/or intermittent drainage. Environmental setting of HPA would provide adequate food resources within and surrounding the area. Geological processes are important because they have the potential for protecting the integrity of an archaeological site by burying it within deep sediments or destroying it by erosional processes. Based on the variables mentioned above, the proposed construction of the Yantis-Dallas Pump Station transmission line may potentially impact previously unrecorded sites.

Each of the links for the five primary alternative routes was individually assessed for the probability of containing cultural resource sites before the route was evaluated in its entirety. Only one link, Link A, is located within 1,000 ft of a previously recorded site. However, the site was inundated by Lake Fork Creek Reservoir and will not be impacted by the proposed project. None of the other links is located within 1,000 ft of previously recorded cultural resource sites.

Because all five primary routes are equal regarding the number of sites crossed (zero) and within 1,000 ft (1), the amount of HPA crossed was used to determine the rankings from a cultural resources standpoint. The amount of HPA crossed by the five primary routes ranges from approximately 12,775 ft (2.4 miles) for Route 5 to approximately 20,775 ft (3.9 miles) for Route 4 (Table 6-1). Therefore, Route 5 is the preferred route from a cultural resources standpoint and Route 4 the least desirable. Route 1 (approximately 15,125 ft or 2.9 miles), Route 3 (approximately 17,825 ft or 3.4 miles), and Route 2 (approximately 18,075 ft or 3.4 miles) are ranked second, third, and fourth, respectively.

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Section 5.0

Public Involvement Program

5.0 PUBLIC INVOLVEMENT PROGRAM

5.1 OPEN-HOUSE MEETING

WCEC held a public open-house meeting at WCEC's headquarters in Quitman, Wood County, on September 9, 2004. This meeting was intended to solicit comments from citizens, landowners, and public officials concerning the proposed project. The meeting had the following objectives:

- Promote a better understanding of the proposed project including the purpose, need, and potential benefits and impacts;
- Inform and educate the public with regard to the routing procedure, schedule, and decision process;
- Ensure that the decision-making process accurately identifies and considers the values and concerns of the public and community leaders.

Public involvement contributed both to the evaluation of issues and concerns by WCEC and to the selection of a preferred route for the project. Information on public involvement is located in Appendix A.

The public open-house meeting was held on September 9, 2004, from 3:00 to 7:00 P.M. at WCEC's headquarters on Maine Street in Quitman, Texas. All landowners between the Yantis Substation and Dallas Pump Station whose property was crossed by a preliminary alternative route or whose residence was within 300 ft of a preliminary alternative route were sent letters (with a map) inviting their attendance and participation in the open-house meeting. In addition to these potentially affected landowners, all those people receiving electric service in the same corridor were also sent invitation letters. A copy of the landowner invitation letter is located in Appendix A. Furthermore, the public open-house meeting was advertised in a local newspaper, *The Wood County Democrat*, on September 8, 2004. The newspaper advertisement showed a map of the study area and alternative routes, and invited public attendance and input (see Appendix A).

At the meeting, rather than a formal presentation in a speaker-audience format, WCEC, C-PCE, and PBS&J staff utilized space by setting up several information stations. Each station was devoted to a particular aspect of the routing study and was manned by WCEC, C-PCE, and/or PBS&J staff. The stations had maps, illustrations, photographs, and/or text explaining each particular topic. Interested citizens and property owners were encouraged to visit each station in order, so that the entire process could be explained in the general sequence of project development. The information-station format is advantageous because it allows attendees to process information in a more-relaxed manner, and also allows them to focus on their particular area of interest and ask specific questions. More importantly, the one-on-one discussions with WCEC/C-PCE/PBS&J staff encourage more interaction from those citizens who might be hesitant to participate in a speaker-audience format.

WCEC representatives at the first station welcomed and signed in visitors, and handed out an information package. The information package included a questionnaire by which participants could express their concerns and comments in writing. The questionnaire solicited comments on citizen concerns as well as an evaluation of the information presented at the open-house meeting. A copy of the handout and blank questionnaire can be found in Appendix A. Participants were given the opportunity to ask questions and present concerns and suggestions at each information station, as well as encouraged to provide their comments and concerns in writing by completing the questionnaire. Completed questionnaires were collected by WCEC during the meeting. Although the public was offered the option of returning the completed questionnaire to WCEC by mail or by fax rather than during the meeting, WCEC received no further completed questionnaires after the meeting was over. Of the 26 citizens/landowners who signed in at the public open-house meeting, WCEC received 18 completed questionnaires (69%).

The majority of public open-house participants who registered comments and concerns were landowners within the study area. Participants provided information during both the at-table discussions and from the questionnaires handed out at the meeting. The concerns and comments provided by the participants were taken into account when selecting and evaluating alternative routes, where applicable and feasible. A summary of the concerns and comments expressed at the public open-house meeting is included in Appendix A.

5.2 AGENCY CORRESPONDENCE

The following local, state, and federal agencies and officials were contacted by letter in June 2004 by PBS&J to solicit comments, concerns and information regarding potential environmental impacts, permits or approvals for the construction of the Yantis to Dallas Pump Station 69/138-kV transmission line project in Wood County, Texas. A map of the study area was included with each letter. Sample copies of PBS&J's letters and all responses received as of the date of this report are included as Appendix B.

Local

- Wood County Judge and County Commissioners
- Ark-Tex Council of Governments (ATCOG)
- East Texas Council of Governments (ETCOG)

State

- Texas Department of Transportation (TxDOT)
  - Department of Aviation
  - Division of Environmental Affairs
- Texas Historical Commission (THC)

- Texas Commission on Environmental Equality (TCEQ)
- Texas Parks and Wildlife Department (TPWD)
- Texas Water Development Board (TWDB)

Federal

- Federal Emergency Management Agency (FEMA), Region 6
- U.S. Environmental Protection Agency (EPA), Region 6
- U.S. Army Corps of Engineers (USACE), Fort Worth District
- U.S. Fish and Wildlife Service (FWS)
- National Park Service (NPS)
- Natural Resource Conservation Service (NRCS)
- Federal Aviation Administration (FAA)

As of the date of this report, written replies have been received from the following agencies/offices: USACE, NPS, FWS, TxDOT (Aviation Division), THC, TCEQ, and TPWD. No responses were received from local agencies/officials.

The USACE indicated that, because of the permit workload, they would take a while to respond. However, they did assign a project number (200400364) and a project manager, and referenced their websites for further information. They also noted that additional information may be required.

The NPS stated that they had determined that no National Park Service Units were located in the vicinity and, therefore, had no comments on the project.

The FWS noted that their office had previously provided comments on this project in July 1999 and October 2000 before the project was put on hold. Their current response provided updated comments. FWS stated that the interior least tern (*Sterna antillarum*), bald eagle (*Haliaeetus leucocephalus*), and Louisiana pinesnake (*Pituophis ruthveni*) have been recorded from Wood County. The interior least tern is federally/state-endangered and the bald eagle federally/state-threatened, while the Louisiana pinesnake is a federal candidate species. Federal candidates are not afforded federal protection under the Endangered Species Act. FWS noted that the interior least tern has been observed at Lake Fork Reservoir and has been documented as nesting at nearby Cooper Reservoir and Lake Tawakoni Reservoir, while the bald eagle is a winter and spring resident in Wood County and has been documented nesting at Lake Fork Reservoir in recent years. FWS, therefore, expressed concerns about potential impacts to these species as a result of the proposed project and recommended that an evaluation be conducted and a determination of affect be made regarding these species. Because the proposed line would cross Lake Fork Reservoir, FWS reiterated their concerns with regard to potential impacts to federally listed species, wetlands, and other fish and wildlife resources imposed by powerline crossings of large waterbodies. Additionally, FWS included copies of two previous comments pertaining to this project dated July 22, 1999 and October 12, 2000.

The Aviation Division of TxDOT stated that the FAA would require notice if either of the two following criteria established under Federal Aviation Regulations (FAR), Part 77 are met: 1) Any vertical obstruction, temporary or permanent, that penetrates a 100 to 1 slope for a horizontal distance of 20,000 ft from the nearest point of the nearest runway, starting at the surface at the edge of that runway, for each airport with at least one runway more than 3,200 ft in actual length, excluding heliports; and 2) any obstruction or alteration of more than 200 ft above the surface of the ground at its location. TxDOT noted that one public-use airport, Wood County Airport, is located within the study area and may meet the above criteria. TxDOT included copies of the appropriate notification form.

The THC commented that although the route had not been identified, they would most likely recommend a cultural resources survey for the project near Lake Fork Reservoir. THC stated that they would be willing to review the project again once the placement of the line is established or PBS&J's archeologists submit their in-house assessment and recommendations for concurrence or review.

The TCEQ responded that Wood County is currently unclassified or in attainment of the National Ambient Air Quality Standards for all six criteria in air pollutants and, therefore, that general conformity does not apply. They stated that although any demolition, construction, rehabilitation, or repair project will produce dust and particulate emissions, these actions should pose no significant impact upon air quality standards. They further stated that any minimal dust and particulate emissions should easily be controlled by the construction contractors using standard dust mitigation techniques. The TCEQ also recommended that the environmental assessment address actions that will be taken to prevent surface and groundwater contamination during and after construction.

The TPWD commented that if migratory bird species are found nesting on or adjacent to the project area, that they must be dealt with in a manner consistent with the Migratory Bird Treaty Act (MBTA). They recommended the use of existing ROW for all new transmission lines because this avoids and/or minimizes impacts to undisturbed habitat. TPWD noted that shorebirds and waterfowl utilize the habitat in and around Lake Fork Reservoir and recommended that transmission line markers be installed where the line crosses the reservoir, as well as at other water crossings, in order to reduce the potential for bird collisions. They suggested that newly disturbed areas should be seeded or sodded with native plants species and that measures should be taken to eliminate the use of non-authorized vehicles on any access roads. They further suggested that natural buffers continuous to any wetlands and aquatic systems should remain undisturbed in order to preserve wildlife cover, food sources, and travel corridors. TPWD also attached a list of the rare, threatened, and endangered species that may occur in Wood County.

As of the date of this report, these were the only agencies/officials who had responded. A copy of each response is included in Appendix B of this report.

Section 6.0

Preferred Route Selection

6.0 PREFERRED ROUTE SELECTION

PBS&J, with review and assistance from WCEC, evaluated numerous preliminary alternative routes for the proposed Yantis-Dallas Pump Station 69/138-kV transmission line project, based on environmental/land use criteria and public/agency input. WCEC also took into consideration engineering, cost, operation, and maintenance factors. The resulting routes were presented to the general public at an open-house meeting held in September 2004. As a result of the ongoing evaluations and the public meeting, these routes were narrowed down to five primary alternative routes. These five primary alternative routes were then subjected to a detailed environmental analysis by PBS&J, and an engineering and cost analysis by WCEC. A preferred route was selected by PBS&J from these five primary alternative routes.

6.1 PBS&J'S ENVIRONMENTAL EVALUATION

PBS&J used a consensus process to evaluate the potential environmental impact of the alternative routes. PBS&J professionals with expertise in different environmental disciplines (terrestrial and aquatic ecology, land use/planning, and cultural resources) evaluated the five primary alternative routes. This evaluation was based on data collected for 33 separate environmental criteria; comments from local, state, and federal agencies; public involvement; and field reconnaissance of the study area and proposed alternative routes. The amount or number of each environmental criterion measured along the primary alternative routes is presented in Table 6-1. Each person on the evaluation team independently analyzed the routes from the perspective of their particular discipline and subsequently discussed their independent results as a group. Factors of particular importance in the land use evaluation included the length paralleling existing ROW, proximity to habitable structures (i.e., residences, businesses, schools, churches, hospitals, nursing homes, etc.), the amount paralleling apparent property lines, and overall length. The main factors considered important in the ecological evaluation were the length across upland and riparian woodland, length across potential wetlands, and the number of stream crossings. The cultural resources evaluation focused on the number of recorded historic/prehistoric sites crossed by or within 1,000 ft of the alternatives and on the length across areas of predicted high probability for the occurrence of cultural resources.

The relationship, sensitivity, and relative importance of the major environmental criteria were determined by the evaluation group as a whole. The preferred route was selected by reaching a consensus of the group based solely on measurable environmental/land use factors. At the same time, the group ranked all five primary alternatives in order of their potential environmental impact. These rankings are shown in Table 6-2.

TABLE 6-1

ENVIRONMENTAL DATA USED IN ALTERNATIVE ROUTE EVALUATION
YANTIS-DALLAS PUMP STATION 69/138-KV PROJECT

	Alternative Routes				
	1	2	3	4	5
Land Use					
Length of alternative route	33,050	33,375	32,100	32,425	31,225
Number of habitable structures[1] within ROW	0	0	0	0	0
Number of habitable structures within 300 ft of ROW centerline	16	11	8	3	7
Length of ROW paralleling existing road/highway ROW	5,675	5,675	0	0	0
Length of ROW paralleling apparent property lines	0	2,500	1,800	4,300	6,700
Length of ROW crossing parks/recreational areas[2]	6,450	6,450	5,800	5,800	5,800
Number of parks/recreational areas[2] within 1,000 ft of ROW centerline	0	0	0	0	0
Length of ROW crossing cropland	0	0	0	0	0
Length of ROW crossing pastureland	20,475	22,450	20,825	22,800	19,100
Length of ROW crossing cropland or pastureland with mobile irrigation systems	0	0	0	0	0
Number of U.S. and State highway crossings	0	0	0	0	0
Number of farm-to-market (FM) road crossings	1	1	1	1	1
Number of county road crossings	6	5	7	6	3
Number of FAA-registered airstrips within 10,000 ft of ROW centerline	0	0	0	0	0
Number of commercial AM radio transmitters within 10,000 ft of ROW centerline	0	0	0	0	0
Number of FM radio transmitters, microwave towers, and other electronic installations within 2,000 ft of ROW centerline	0	0	0	0	1
Aesthetics					
Estimated length of ROW within foreground visual zone[3] of U.S. and State highways	3,100	0	3,100	0	0
Estimated length of ROW within foreground visual zone[3] of FM roads	5,780	4,650	5,780	4,650	2,680
Estimated length of ROW within foreground visual zone[3] of parks/recreational areas	10,850	10,850	11,550	11,550	10,050
Estimated length of ROW within foreground visual zone[3] of churches, schools, and cemeteries	2,300	0	2,300	0	0
Ecology					
Length of ROW crossing upland woodland	5,000	3,700	4,650	3,350	5,300
Length of ROW crossing bottomland/riparian woodland	1,350	950	1,350	950	300
Length of ROW crossing potential wetlands (including bottomland)	1,200	800	1,200	800	0
Length of ROW crossing known habitat of endangered or threatened species	0	0	0	0	0
Number of stream crossings	4	4	5	5	1
Length of ROW paralleling streams	800	1,500	0	700	0
Length of ROW crossing open water (lakes, ponds)	6,325	6,425	5,750	5,850	5,750
Length of ROW crossing 100-year floodplains	600	1,200	600	1,200	0
Cultural Resources					
Number of recorded cultural resources sites crossed by ROW	0	0	0	0	0
Number of recorded cultural resources sites within 1,000 ft of ROW centerline	1	1	1	1	1
Number of NRHP-listed or -eligible sites crossed by ROW	0	0	0	0	0
Number of NRHP-listed or -eligible sites within 1,000 ft of ROW centerline	0	0	0	0	0
Length of ROW crossing areas of high archaeological/historical site potential	15,125	18,075	17,825	20,775	12,775

[1]Residences, businesses, schools, churches, hospitals, nursing homes, etc.

[2]Defined as parks and recreational areas owned by a governmental body or an organized group, club, or church.

[3]One-half mile, unobstructed

Note: All length measurements in feet.

TABLE 6-2

ENVIRONMENTAL RANKING OF PRIMARY ALTERNATIVE ROUTES
YANTIS-DALLAS PUMP STATION 69/138-KV TRANSMISSION LINE PROJECT

	Ranking				
	Land Use	Ecology	Cultural Resources	Project Manager	Consensus
Route 1	5th	5th	2nd	5th	5th
Route 2	4th	3rd	4th	3rd	3rd
Route 3	3rd	4th	3rd	4th	4th
Route 4	2nd	1st	5th	2nd	2nd
Route 5	1st	2nd	1st	1st	1st

The land use evaluation concentrated on the amount of existing ROW paralleled, the number of habitable structures within 300 ft of new ROW, amount paralleling apparent property lines, and overall length. Route 5 was selected as the preferred route from a land use perspective because it is the shortest route, it parallels the greatest amount of apparent property lines (21% of its total length), it would be the least visible of all routes, and along with Route 4, has just three habitable structures located within 300 ft (excluding the four RV-type structures). Route 4 is the second choice from a land use perspective. It has three habitable structures located within 300 ft, is the third-shortest route, and parallels the second-most amount of apparent property lines (13%). Route 1 (16 habitable structures within 300 ft, second-longest route) and Route 2 (11 habitable structures within 300 ft, longest route) are the least desirable routes.

The ecological evaluation focused on three primary factors: the amount of woodland crossed, the amount of potential wetlands crossed, and the length of the line. Based on the data in these categories, the ecology evaluator selected Route 4 as the preferred alternative route, followed by routes 5 and 2, respectively. Route 4 crosses the least amount of woodland and the second-least amount of potential wetlands. Although Route 5 crosses more woodland than Route 2, it was selected over Route 2 because it crosses less bottomland/riparian woodland (which is more valuable as wildlife habitat than upland woodland), crosses no potential wetlands, crosses the fewest streams, and is the shortest alternative route. Route 1 is the least desirable alternative route from an ecological perspective because it crosses the most woodland and the most potential wetlands.

Because all five primary routes are equal regarding the number of sites crossed and within 1,000 ft, the amount of HPA crossed was used to determine the rankings from a cultural resources standpoint. Thus, Route 5 was selected as the preferred route because it crosses the least amount of HPA. Route 1 was the second choice, followed by alternative routes 3 and 2, respectively. Route 4 was the least desirable because it crosses the most HPA.

PBS&J's project manager for the Yantis-Dallas Pump Station 69/138-kV project reviewed all of the data and evaluations produced by the evaluators and ranked the five alternative routes as follows: Route 5 (1st), Route 4 (2nd), Route 2 (3rd), Route 3 (4th), and Route 1 (5th).

Based on a group discussion of the relative value and importance of each set of criteria (human, cultural, and natural resources), it was the consensus of the group that Route 5 was the first choice, being ranked first by all evaluators except for the ecology evaluator who ranked it second. Route 5 is the shortest route, parallels the greatest amount of apparent property lines, has just three habitable structures located within 300 ft (apart from four RV-type structures), would be the least visible, crosses the least amount of bottomland/riparian woodland and potential wetlands, crosses the fewest streams, does not parallel any streams, crosses no 100-year floodplain, and crosses the least HPA for cultural resources. Routes 4 and 2 were ranked second and third, respectively, by the evaluation group. Route 2 was preferable to Route 3 as third choice because it parallels more existing ROW, would be less visible, and would have less impact on ecological resources. Route 1 is the fifth choice. Nevertheless, it was the opinion of the group of evaluators that all five of the primary alternative routes are environmentally acceptable alternative routes for this project.

Therefore, based upon its evaluation of this particular project and its experience and expertise in the field of transmission line routing, PBS&J recommends Route 5 as the preferred route, Route 4 as the first alternate, and Route 2 as the second alternate, since, considering all pertinent factors, these routes best satisfy the criteria specified in Section 37.056(c)(4) of the Texas Utilities Code for consideration in the granting of CCNs. PBS&J also recommends filing routes 3 and 1 as the third and fourth alternates, respectively.

6.2 WCEC'S PREFERRED ROUTE SELECTION

Following a review of PBS&J's alternative route analysis; taking into consideration engineering, ROW and cost factors; WCEC concurred with PBS&J's recommendations of the preferred and alternate routes. The routes to be filed with the PUC and noticed to potentially affected landowners are shown in Figure 6-1. They are as follows: Route 5 (preferred route), and routes 4, 2, 3, and 1 (alternate routes). The location of habitable structures and other land use features in the vicinity of the preferred/alternate routes to be filed and noticed are also shown in Figure 6-1 (map pocket), as well as being presented in table 6-3 through 6-7.

TABLE 6-3

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES
IN THE VICINITY OF WCEC'S PREFERRED ROUTE 5
YANTIS-DALLAS PUMP STATION 69/138-KV PROJECT

Map Number[1]	Structure/Feature	Approximate Distance from Centerline	Direction
1	Archaeological site (WD486)	250 ft	SE
13	Single-family residence	175 ft	NE
14	Single-family residence	225 ft	SE
15	RV trailer (on blocks)	125 ft	W
16	RV trailer (on blocks)	125 ft	W
17	RV trailer (on blocks)	125 ft	W
18	RV trailer (on blocks)	125 ft	W
19	Cellular tower (People's Wireless)	100 ft	E
20	Single-family residence	285 ft	W

[1]See Figure 6-1 (map pocket).

TABLE 6-4

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES
IN THE VICINITY OF WCEC'S ALTERNATE ROUTE 4
YANTIS-DALLAS PUMP STATION 69/138-KV PROJECT

Map Number[1]	Structure/Feature	Approximate Distance from Centerline	Direction
1	Archaeological site (WD486)	250 ft	SE
10	Mobile home	300 ft	E
11	Single-family residence	270 ft	W
12	Single-family residence	300 ft	W

[1]See Figure 6-1 (map pocket).

TABLE 6-5

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES
IN THE VICINITY OF WCEC'S ALTERNATE ROUTE 2
YANTIS-DALLAS PUMP STATION 69/138-KV PROJECT

Map Number[1]	Structure/Feature	Approximate Distance from Centerline	Direction
1	Archaeological site (WD486)	250 ft	SE
2	Mobile home	150 ft	E
3	Mobile home	180 ft	E
4	Mobile home	280 ft	E
5	Fishing cabin	210 ft	E
6	Fishing cabin	190 ft	E
7	Fishing cabin	270 ft	E
8	Fishing cabin	300 ft	E
9	Mobile home	290 ft	E
10	Mobile home	300 ft	E
11	Single-family residence	270 ft	W
12	Single-family residence	300 ft	W

[1]See Figure 6-1 (map pocket).

TABLE 6-6

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES
IN THE VICINITY OF WCEC'S ALTERNATE ROUTE 3
YANTIS-DALLAS PUMP STATION 69/138-KV PROJECT

Map Number[1]	Structure/Feature	Approximate Distance from Centerline	Direction
1	Archaeological site (WD486)	250 ft	SE
10	Mobile home	300 ft	E
11	Single-family residence	270 ft	W
12	Single-family residence	300 ft	W
21	Mobile home	270 ft	W
22	Single-family residence	150 ft	E
23	Mobile home	300 ft	W
24	Mobile home	270 ft	E
25	Single-family residence	240 ft	E

[1]See Figure 6-1 (map pocket).

TABLE 6-7

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES
IN THE VICINITY OF WCEC'S ALTERNATE ROUTE 1
YANTIS-DALLAS PUMP STATION 69/138-KV PROJECT

Map Number[1]	Structure/Feature	Approximate Distance from Centerline	Direction
1	Archaeological site (WD486)	250 ft	SE
2	Mobile home	150 ft	E
3	Mobile home	180 ft	E
4	Mobile home	280 ft	E
5	Fishing cabin	210 ft	E
6	Fishing cabin	190 ft	E
7	Fishing cabin	270 ft	E
8	Fishing cabin	300 ft	E
9	Mobile home	290 ft	E
10	Mobile home	300 ft	E
11	Single-family residence	270 ft	W
12	Single-family residence	300 ft	W
21	Mobile home	270 ft	W
22	Single-family residence	150 ft	E
23	Mobile home	300 ft	W
24	Mobile home	270 ft	E
25	Single-family residence	240 ft	E

[1]See Figure 6-1 (map pocket).