ATTACHMENT A

ENVIRONMENTAL ASSESSMENT AND ALTERNATIVE ROUTE ANALYSIS FOR THE LAKE LIVINGSTON – RICH 1328-kV TRANSMISSION LINE PROJECT – POLK AND SAN JACINTO COUNTIES, TEXAS

Environmental Assessment and
Alternative Route Analysis for the
Lake Livingston-Rich
138-kV Transmission Line Project
Polk and San Jacinto Counties, Texas

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ENVIRONMENTAL ASSESSMENT AND ALTERNATIVE ROUTE ANALYSIS FOR THE LAKE LIVINGSTON-RICH 138-kV TRANSMISSION LINE PROJECT POLK AND SAN JACINTO COUNTIES, TEXAS

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Acronyms and Abbreviations

ALP	Alternative Licensing Process
ANSI	American National Standards Institute
AOU	American Ornithologists' Union
APLIC	Avian Power Line Interaction Committee
BEG	Bureau of Economic Geology
BGEPA	Bald and Golden Eagle Protection Act
BIA	Bureau of Indian Affairs
BLS	U.S. Bureau of Labor Statistics
BMP	best management practice
CCN	Certificate of Convenience and Necessity
CLF	civilian labor force
DOI	U.S. Department of the Interior
EA	Environmental Assessment
EPA	Environmental Protection Agency
EPRI	Electric Power Research Institute
ESA	Endangered Species Act
ETEC	East Texas Electric Cooperative, Inc.
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FPPA	Farmland Protection Policy Act
ft	feet/foot
FWS	U.S. Fish and Wildlife Service
HPA	high probability area
kV	kilovolt
MCM	thousand circular mils
MBTA	Migratory Bird Treaty Act
mg/L	milligrams per liter
msl	mean sea level
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NASS	National Agricultural Statistics Service
NESC	National Electrical Safety Code
NOI	Notice of Intent
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
NWP	Nationwide Permit
OPGW	optical ground wire
PAD	Pre-Application Document
PUC	Public Utility Commission of Texas

ROW	right-of-way
SAL	State Archeological Landmark
SCS	Soil Conservation Service
SHECO	Sam Houston Electric Cooperative, Inc.
SWPPP	Storm Water Pollution Prevention Plan
TARL	Texas Archeological Research Laboratory
TCEQ	Texas Commission on Environmental Quality
THC	Texas Historical Commission
THM	Texas Historic Marker
TORI	Texas Outdoor Recreation Inventory
TORP	Texas Outdoor Recreation Plan
TPWD	Texas Parks and Wildlife Department
TSHA	Texas State Historical Association
TWC	Texas Workforce Commission
TWDB	Texas Water Development Board
TxDOT	Texas Department of Transportation
TXNDD	Texas Natural Diversity Database
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
UT	The University of Texas at Austin

Section 1.0

Introduction

1.0 INTRODUCTION

1.1 SCOPE OF PROJECT

East Texas Electric Cooperative, Inc. (ETEC) is proposing to construct new transmission facilities in Polk County, Texas to provide service for a 24-megawatt (MW) hydroelectric generating facility that ETEC is constructing adjacent to the Lake Livingston Dam. ETEC is currently working with the Federal Energy Regulatory Commission (FERC) on permitting the proposed generating facility, with permit approval expected late 2009/early 2010. ETEC's new transmission facilities will include a new substation at the generating facility and a new single-circuit 138-kilovolt (kV) electric transmission line. The new transmission line will connect the proposed substation with Sam Houston Electric Cooperative, Inc.'s (SHECO's) existing Rich Substation, located approximately 1.6 miles northwest of Goodrich. The new line will be approximately 3 miles long and will be built utilizing single-pole construction within a right-of-way (ROW) 100 feet (ft) in width. Figure 1-1 shows the location of the study area for the project.

This Environmental Assessment and Alternative Routing Analysis (EA) is intended to provide information and address issues concerning the natural, human, and cultural environment within the study area. This document may also be used in support of any local, state, or federal permitting activities that may be required for the proposed project.

1.2 PURPOSE AND NEED

ETEC is a wholesale electric provider for 10 distribution electric cooperatives in East Texas. In order to diversify its power supply portfolio and acquire new sources of clean, renewable, cost-effective energy, ETEC intends to develop a hydroelectric power plant at Lake Livingston Dam, Polk County, Texas. The proposed transmission facilities will provide service for the proposed 24-MW hydroelectric generating facility.

1.3 DESCRIPTION OF PROPOSED DESIGN

1.3.1 Loading, Weather Data, and Design Criteria

All newly installed facilities will be designed using National Electrical Safety Code (NESC) 2007 heavy loading factors (American National Standards Institute [ANSI], 2007). This transmission line is located in the ANSI NESC Medium Loading district. However, experience and successful historical performance has been obtained in this and other areas with facilities that have been designed using NESC heavy loading conditions, which take into account both ice and wind conditions, and using other loading cases which are more conservative than the NESC Medium Loading district.

1.3.2 Structural and Geotechnical

All structural components, conductors, and overhead ground wires will be designed using the appropriate overload capacity factors, strength reduction factors, and tension limits given in NESC 2007 and the manufacturer's recommended strength ratings for hardware, etc., when applicable. Where NESC 2007 is silent, engineering judgment will be used. The NESC Heavy Loading district design factors and extreme wind conditions will be utilized to determine tension limits and sags for all wires.

Conductors and shield wires will be installed on either steel or concrete single-pole structures, as shown on Figure 1-2. This construction will utilize three upswept steel davit arms in a delta configuration, each supporting a 795-thousand circular mils (MCM) Aluminum Conductor Steel Reinforced (ACSR) 26/7 phase conductor on a suspension insulator, and one ⅜-inch, 7-strand, high-strength, steel conductor supported from an attachment at the apex of the pole. The configuration of the conductor and shield wires will provide adequate clearance for operation at 138 kV, considering icing and extreme wind conditions.

The poles will be designed for direct embedment into the ground with no concrete foundation required. The TU-1 configuration will have a basic pole height of approximately 70 ft; however, structure heights will vary depending on terrain, structure location, and span length from a minimum of 65 ft to a maximum height of 100 ft. The ruling span will be approximately 500 ft, with a range of approximately 400 to 600 ft, depending on terrain variations. Geotechnical considerations will include soil borings and in situ soils testing to provide the parameters for foundation design and/or the embedment depth required for new structures.

1.3.3 Insulation and Lightning Performance

To reduce the likelihood of circuit outages due to lightning strikes contacting the phase conductors, overhead ground wires will be used. Grounding will be accomplished with external ground rods or counterpoise.

1.4 CONSTRUCTION CONSIDERATIONS

Projects of this type require surveying and clearing, foundation installation, structure assembly and erection, conductor and shield wire installation, and cleanup when the project is completed. The following information regarding these activities was provided to PBS&J by ETEC.

1.4.1 Clearing

Any required clearing of the ROW will be performed by the contractor under the direction of ETEC. Available methods of disposal are mulching, brush piling, and salvaging. The option often selected by landowners requires that cleared brush or trees be stacked and left for use as wildlife habitat adjacent to, but off, the ROW. Trees and brush in the ROW are initially cleared to permit safe construction of the line.

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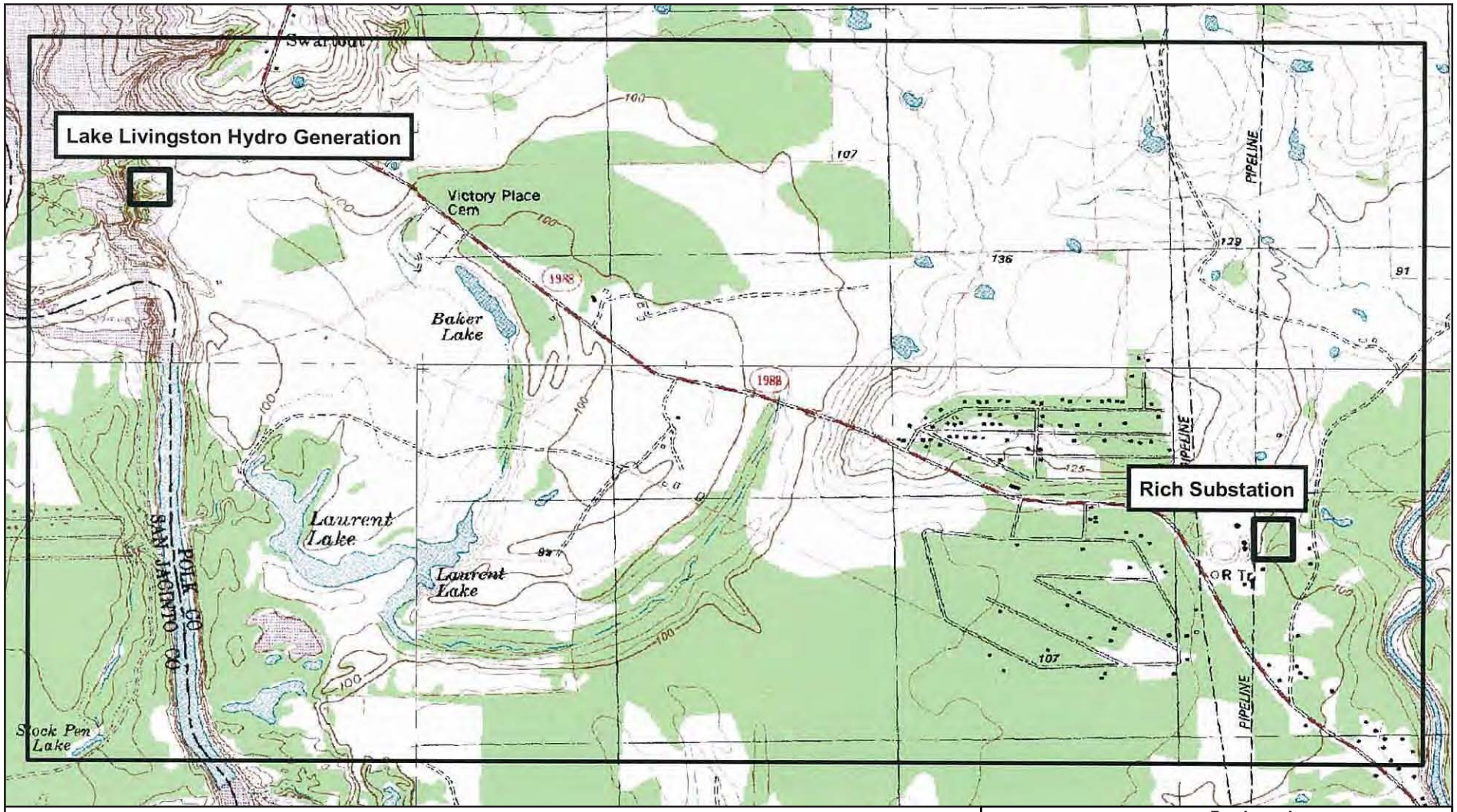

north

0 2000 4000 feet

Base Map: USGS 7.5' Quadrangles; Blanchard, Livingston, Camilla, and Goodrich Tx.

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Figure 1-1

STUDY AREA LOCATION
LAKE LIVINGSTON-RICH
138-KV TRANSMISSION LINE PROJECT

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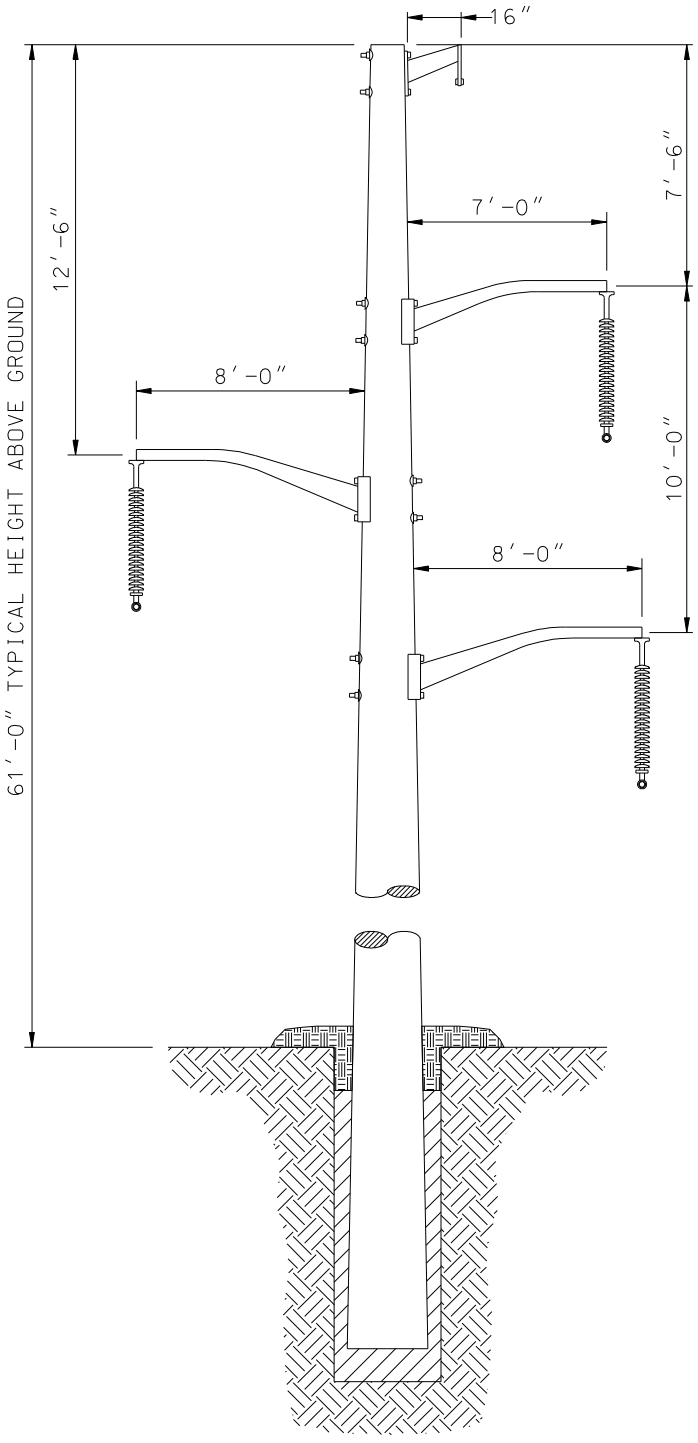

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Figure 1-2

TYPICAL TU-1 STRUCTURE
LAKE LIVINGSTON-RICH
138-KV TRANSMISSION LINE PROJECT

Source: Cornelius–Pierce Consulting Engrs., Inc.

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The ROW will be utilized for access during construction operations, with ingress and egress procured through private property utilized as necessary to access the ROW. In these cases, existing private roads will be used where possible. Culverts will be installed to cross creeks and tributaries, where necessary.

Clearing plans, methods, and practices are extremely important for success in any program designed to minimize the adverse effects of electric transmission lines on the natural environment. The following factors implemented and applied to this project, will help meet this goal:

1. Clearing will be performed in a manner that will maximize the preservation of natural habitat and the conservation of natural resources.
2. The time and method of clearing ROW will take into account soil stability, the protection of natural vegetation, sensitive habitats, the protection of adjacent resources such as natural habitat for plants and wildlife, and the prevention of silt deposition in watercourses.
3. Unless landowner preference dictates otherwise, ETEC will use the most efficient and effective method to remove undesirable plant species. Hydroaxes and flail mowers may be used in clearing operations where such use will preserve the cover crop of grass, and similar vegetation. If herbicides are deemed appropriate, they will be applied and handled in accordance with the product manufacturers' published recommendations and specifications and as directed by appropriate qualified staff. ETEC will make reasonable efforts to notify landowners or their designee prior to the start of herbicide application, unless the landowners agree otherwise.
4. Trees and brush will be cleared in a straight path unless accommodating specific landowner requests that do not create safety concerns for operation and maintenance of the transmission line.

1.4.2 Construction

The following is a description of typical construction methods for transmission line projects. Survey crews will stake or otherwise mark structure locations. Depending on soil type, crews will either direct-embed structures or pour foundations utilizing augured circular holes, rebar cages, and anchor bolts or stubs.

Crews will transport and assemble structures and related hardware. The usual procedure is to assemble each structure on its side, then lift the structure and set it on its base foundation. Taller structures, however, may need to have sections assembled in the air. Sections are either jacked together or connected using bolts, which will be torqued to the recommended value. Where direct-embedded structures are used, crews will install them by auguring oversized holes, lifting and setting the structure, and backfilling with native soils, select fill, or concrete, depending on soil conditions at the site (based on soils testing). Although vehicular traffic is a large part of this operation, construction crews will take care to minimize damage to the ROW by minimizing the number of pathways traveled.

Guard structures (temporary wood-pole structures) will be installed near crossings such as distribution powerlines, overhead telephone lines, roadways, and any other areas where a safety hazard may exist during wire installation. The conductors and shield wires are installed via a tensioning system. A lead line is first threaded through the stringing blocks or dollies for each conductor and shield wire. Conductor and shield wires are then pulled by the lead line and held tight by a tensioner, which essentially keeps the wires from coming in contact with the ground and other objects that could be damaging to the wire. When the wire is tensioned to the required sag, the wire is taken out of the blocks and placed in the suspension and dead-end clamps for permanent attachment.

Construction operations will be conducted with attention to the preservation and enhancement of the natural habitat and the conservation of natural resources. The following criteria will be used to attain this goal. These criteria are subject to adjustment according to the rules and judgments of any public agencies whose lands may be crossed by the proposed line.

1. Clearing and grading of the construction ROW, staging areas, storage areas, setup sites, etc., will be minimized. These areas will be graded in a manner that will minimize erosion, conform to the natural topography, and, if necessary, have erosion controls installed.
2. Soil that has been excavated during construction and not used will be evenly backfilled onto a cleared area or removed from the site. The backfilled soil will be sloped gradually to conform to the terrain and the adjacent land. If natural seeding will not provide ground cover in a reasonable length of time, appropriate reseeding will be performed.
3. Erosion-control devices will be constructed where necessary to reduce soil erosion in the ROW.
4. Any necessary new roads will not be constructed on unstable slopes. Where feasible, existing ranch or pasture roads will be utilized for service and/or access.
5. Clearing and construction activities near streambeds will be performed in a manner to minimize damage to the natural condition of the area. Stream banks will be restored as necessary to minimize erosion.
6. Efforts will be made to prevent pollution and keep construction waste to a minimum, particularly while performing work near streams, lakes, and reservoirs.
7. Precautions will be taken to prevent the possibility of accidentally starting range fires.
8. Tension stringing of conductors may be employed where possible to reduce the amount of vegetation clearing before final conductor locations are established. Helicopters may be considered for use where environmental or topology factors make an area inaccessible.
9. Precautions will be taken to protect natural features and cultural resources (identified by site-specific studies of the project) along the ROW.
10. If endangered species habitat is present, guidance from the U.S. Fish and Wildlife Service (FWS) will be obtained prior to all clearing and construction activities.

11. Soil disturbance during construction will be kept to a minimum, and restorative measures will be taken in a reasonable length of time.

1.4.3 Cleanup

The cleanup operation involves the restoration of disturbed areas to grade (as much as possible), the removal of construction debris, and the restoration or compensation of any items damaged by the construction of the project.

The following criteria generally apply to the cleanup of construction debris and the restoration of the area's natural setting.

1. If site factors make it unusually difficult to establish a protective vegetative cover, other restoration procedures will be used, such as the use of gravel, rocks, concrete, etc.
2. Sears, cuts, fill, or other aesthetically degraded areas will be allowed to seed naturally or may be reseeded with native species to reduce erosion, restore a natural appearance, and to provide food and cover for wildlife.
3. If temporary roads are removed, the original slopes will be restored.
4. Construction equipment, supplies, and personal property will be dismantled and removed from the ROW when construction is completed.
5. Clearing down to the mineral soil may be required for road access. In this case, water-diversion berms, velocity dissipaters, or other erosion-control devices will be used to reduce erosion potential.
6. Construction waste will be removed prior to completion of the project.
7. Replacement of soil adjacent to water crossings for access roads will be at slopes less than the normal angle of repose for the soil type involved, and will be stabilized/revegetated to avoid erosion.

1.5 MAINTENANCE CONSIDERATIONS

The following information regarding maintenance of the facilities was provided to PBS&J by ETEC. Maintenance of the facilities will include periodic inspection of the line, repair of damaged structures due to equipment failures, accidents, or natural phenomena such as wind damage or lightning. In areas where treatment of vegetation within the ROW is required, mowing, pruning and/or application of Environmental Protection Agency (EPA)-approved herbicides will be conducted as required (normally once every 3 to 5 years) to ensure proper clearance between the conductors and nearby vegetation. While maintenance patrols will vary, aerial patrols and foot patrols will be performed periodically. In cropland areas and properly managed grazing lands, little or no vegetation control will be required, due to existing land-use practices. The major maintenance item will be the trimming of trees that pose a potential danger to the conductors or structure in order to provide a safe and reliable powerline.

1.6 AGENCY ACTIONS

Construction documents and specifications will indicate any special construction measures needed to comply with the regulatory requirements listed below. In addition, depending upon the location of the transmission line structures, floodplain development permits and road crossing permits may be required by Polk County.

1.6.1 Public Utility Commission

ETEC's proposed transmission line project may require an amendment to ETEC's existing Certificate of Convenience and Necessity (CCN) by the Public Utility Commission of Texas (PUC), unless the project is determined to be exempted under Section 37.051(c) of the Texas Utilities Code and/or preempted by the federal licensing requirements under the Federal Power Act (see section 1.6.6, below). This EA report has been prepared by PBS&J in support of ETEC's prospective application for a CCN. This document is intended to provide information on certain environmental and land use factors contained in Section 37.056(c)(4) of the Texas Utilities Code, PUC Substantive Rule 25.101(b)(3)(B), as well as to address relevant questions in the PUC's CCN application. This report may also be used in support of any other local, state, or federal permitting or licensing requirements, as necessary.

1.6.2 U.S. Army Corps of Engineers

Under Section 404 of the Clean Water Act, activities in wetlands are regulated by the U.S. Army Corps of Engineers (USACE), in conjunction with the EPA. The discharge of dredged or fill materials, draining, excavation, or mechanized land clearing in waters of the U.S., including wetlands, is subject to USACE regulatory policies. Thus, potential wetland impacts incurred by the proposed transmission line project are subject to USACE regulation.

Certain construction activities that potentially impact waters of the U.S., may be authorized by one of the USACE's Nationwide Permits (NWPs). Permits that may apply to placement of support structures and associated activities are NWP 25 and NWP 12. NWP 25 authorizes the discharge of concrete, sand, rock, etc., into tightly sealed forms or cells where the material is used as a structural member for standard pile-supported structures (linear projects, not buildings or other structures). NWP 12 authorizes discharges associated with the construction of utility lines and substations within waters of the U.S. and additional activities affecting waters of the U.S. such as those associated with the construction and maintenance of utility line substations; foundations for overhead utility line towers, poles, and anchors; and access roads for the construction and maintenance of utility lines.

Under Section 10 of the Rivers and Harbors Act of 1899, the USACE is directed by Congress to regulate all work and structures in, or affecting the course, condition, or capacity of, navigable waters of the U.S. No structures will be placed in navigable waters of the U.S.; therefore, permitting under Section 10 of the Rivers and Harbors Act will not be required.

1.6.3 Texas Commission on Environmental Quality

This project would require more than 1 acre of clearing; therefore, the Texas Commission on Environmental Quality (TCEQ) would require implementation of a Storm Water Pollution Prevention Plan (SWPPP). ETEC will submit a Notice of Intent (NOI) with the TCEQ prior to clearing and construction.

1.6.4 Texas Historical Commission

ETEC will obtain clearance from the Texas Historical Commission (THC) with regard to requirements concerning historic and prehistoric cultural resources, prior to construction.

1.6.5 Texas Department of Transportation

Permits will be obtained from the Texas Department of Transportation (TxDOT) for any crossing of a state-maintained roadway.

1.6.6 Federal Energy Regulatory Commission

The Lake Livingston Hydroelectric Project requires a license from the FERC under Part I of the Federal Power Act (FPA). The FERC license will encompass not only the proposed hydropower generating facilities, but also the primary transmission line connecting the generating station to the transmission grid. In April 2006, ETEC received a preliminary permit from FERC for a term of 3 years. The purpose of a preliminary permit is to maintain exclusive priority of application for a license during the term of the permit while the permittee conducts investigations, consults with the appropriate resource agencies, and prepares an acceptable license application. In December 2007, ETEC submitted to FERC an NOI to file an original license application for the Lake Livingston Hydroelectric Project, along with a Pre-Application Document (PAD) summarizing existing, available, relevant information about the proposed project environment. ETEC concurrently requested authorization to utilize Alternative Licensing Procedures under FERC's regulations, which request was granted by FERC in February 2008.

On February 27, 2008, FERC issued an initial Scoping Document for the proposed hydropower project. The scoping document identified a preliminary list of environmental issues that will be addressed in an EA to be prepared by FERC staff pursuant to NEPA and other pertinent laws, and invited interested stakeholders to participate in a public scoping process to identify additional issues and provide relevant information about the project. The FERC staff subsequently held a public scoping meeting and site visit on March 26, 2007. ETEC expects to submit a license application to FERC by March 31, 2009 (the date its preliminary permit expires), and anticipates receiving a license by late 2009/early 2010.

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Section 2.0

Development and Evaluation of Alternative Transmission Line Routes

2.0 DEVELOPMENT AND EVALUATION OF ALTERNATIVE TRANSMISSION LINE ROUTES

2.1 OBJECTIVE OF STUDY

The objective of this study was to develop and evaluate several alternative transmission line routes and ultimately recommend a preferred transmission line route for ETEC's proposed 138-kV transmission line that is feasible from economic, engineering, and environmental standpoints. The following sections provide a description of the process used in the development, evaluation, and selection of alternative transmission line routes.

2.2 DATA COLLECTION

Data used by PBS&J in the delineation and evaluation of alternative routes were drawn from a variety of sources, including published literature (documents, reports, maps, aerial photography, etc.), and information from local, state and federal agencies. Recent color aerial digital photography (December 2007), various-scale U.S. Geological Survey (USGS) topographic maps (1:24,000), TxDOT county highway maps, FWS National Wetlands Inventory (NWI) maps, Federal Emergency Management Agency (FEMA) maps, and a ground reconnaissance survey were used throughout the development and evaluation of alternative routes. Ground reconnaissance of the study area and computer-based evaluation of digital aerial imagery were utilized for both refinement and evaluation of alternative routes. The data collection effort, although concentrated in the early stages of the project, was an ongoing process and continued up to the point of final route selection.

2.3 DEVELOPMENT OF ALTERNATIVE ROUTES

2.3.1 Study Area Delineation

The first step in the development of alternative routes was to delineate a study area. This area needed to encompass both project termination points (a proposed substation near the Lake Livingston Dam and the existing Rich Substation) and include a large enough area within which a sufficient number of alternative routes could be located. The study area is approximately 3.2 miles long by 1.9 miles wide, and encompasses approximately 6 square miles in Polk and San Jacinto counties (see Figure 1-1).

2.3.2 Constraints Mapping

In an effort to minimize potential impacts to sensitive environmental and land use features, a constraints mapping process was used in identifying/developing/refining possible alternative routes. The geographic locations of environmentally sensitive and other restrictive areas within the study area were located and considered during transmission line route delineation. These constraints were mapped onto a USGS topographic base map (Figure 2-1, map pocket). The overall impact of the alternative routes presented in this report has been greatly reduced by avoiding, to the greatest extent practical, such constraints as

subdivisions, individual residences, community facilities, parks/recreation areas, cemeteries, historic sites, archaeological sites, wetlands, churches, schools, and endangered or threatened species habitat, and by utilizing or paralleling existing compatible ROW and property lines, where practical.

2.3.3 Preliminary Alternative Routes

Utilizing the information described above, PBS&J developed preliminary alternative routes between the proposed substation near the dam on Lake Livingston and the existing Rich Substation. These routes were refined as more information became available. Community values, existing and proposed land use, and areas of environmental concern were taken into consideration when developing these preliminary routes.

ETEC continually reviewed the preliminary routes throughout their development, taking into consideration the additional factors of engineering/system planning issues. The resulting preliminary route network, shown on Figure 2-2, was presented to the public at an open-house meeting in March 2008.

2.3.4 Primary Alternative Routes

Following the public open-house meeting, ETEC and PBS&J evaluated public input, discussed the results of the field visit, and considered revisions to the network of segments comprising the preliminary alternative routes presented at the March 2008 public open-house meeting. As a result of these efforts, seven primary alternative routes were selected for an in-depth environmental evaluation. These seven primary routes are shown on Figure 2-3 and Figure 2-4 (map pocket). Table 2-1 presents the composition of these seven routes by segment, as well as their approximate length.

As a result of input received during the public open-house meeting held in March 2008, and from further environmental analysis, several of the preliminary route segments shown at the open house were deleted/added/modified. **Segment A** was deleted because of its proximity to an active bald eagle nest. **Segments K** and **N** were also deleted because of their proximity to this active bald eagle nest. **Segment N** would also have involved extensive clearing of bottomland forest, much of which, according to the landowner, is swamp. The swampiness of the area has been exacerbated by drainage from an adjacent subdivision. **Segment Q** was eliminated because two residences would have been within the ROW. Because of pipelines and other habitable structures, it was not possible to move **Segment Q** to the west side of the existing transmission line. At the request of the landowner, a new segment (**Segment U**) was added in the northern portion of the study area. The addition of **Segment U** resulted in **Segment C** and **Segment R** being divided into segments **C1** and **C2**, and **R1** and **R2**, respectively.

north

500 0 500 1000

scale in feet

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Vicinity Map

Alternative Route

Existing Transmission Line

(A) Alternative Route Segment

Figure 2-2

PRELIMINARY ALTERNATIVE ROUTES

LAKE LIVINGSTON TRANSMISSION LINE PROJECT

Date of Photography: December 20, 2007

Revised: 06/30/08

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north

500 0 500 1000

scale in feet

PBSJ • Engineering • Environmental Consulting • Surveying

Vicinity Map

Alternative Route

Existing Transmission Line

(B) Alternative Route Segment

ROUTE	SEGMENT
1	B-D-J-L-S-T
2	B-D-J-M-O-P
3	B-E-F-H-T
4	B-E-F-I-S-T
5	B-E-G-R1-R2-T
6	C1-C2-R1-R2-T
7	C1-U-R2-T

Figure 2-3

PRIMARY ALTERNATIVE ROUTES

LAKE LIVINGSTON TRANSMISSION LINE PROJECT

Date of Photography: December 20, 2007

Revised: 07/09/08

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TABLE 2-1

PRIMARY ALTERNATIVE ROUTE COMPOSITION AND LENGTH
LAKE LIVINGSTON-RICH 138-KV TRANSMISSION LINE PROJECT

Route	Segments	Length (miles)
1	B-D-J-L-S-T	3.3
2	B-D-J-M-O-P	3.6
3	B-E-F-H-T	2.8
4	B-E-F-I-S-T	2.9
5	B-E-G-R1-R2-T	3.1
6	C1-C2-R1-R2-T	3.1
7	C1-U-R2-T	3.2

Note: For primary alternative route locations, see Figure 2-3 and Figure 2-4 (map pocket).

2.4 ALTERNATIVE ROUTE EVALUATION

The evaluation of the primary alternative routes for the project involved studying a variety of environmental factors. The alternative routes were examined in the field in March 2008. The analysis of each route involved inventorying and tabulating the number or quantity of each environmental criterion located along the centerline of each route (e.g., number of habitable structures within 300 ft, amount of woodland crossed, etc.). The number or amount of each factor was determined by reviewing recent color aerial photography (December 2007), USGS topographic maps, FEMA maps, NWI maps, and TxDOT county highway maps, and, where possible, by field verification. The environmental advantages and disadvantages of each primary alternative were then evaluated. Thirty-six environmental criteria were inventoried for each of the primary alternative routes for the project. These criteria are shown in Table 2-2.

The environmental setting of the study area is described in Section 3.0 of this document, while the potential environmental impacts of the primary alternative routes are addressed in Section 4.0. Section 5.0 summarizes the responses from the agencies/officials contacted and Section 6.0 describes the public involvement for the project. The preferred route selection is presented in Section 7.0.

TABLE 2-2

EVALUATION CRITERIA FOR ALTERNATIVE ROUTE EVALUATION
LAKE LIVINGSTON-RICH 138-KV TRANSMISSION LINE PROJECT

LAND USE

1. Length of alternative route
2. Number of habitable structures[1] within 300 ft of ROW centerline
3. Length of ROW parallel to existing ROW (transmission lines, highways, roads, pipelines, etc.)
4. Length of ROW parallel to property lines not following existing ROW
5. Number of parks/recreational areas[2] crossed by ROW
6. Length of ROW across parks/recreational areas[2]
7. Number of parks/recreational areas[2] within 1,000 ft of ROW centerline
8. Length of ROW across cropland
9. Length of ROW across pastureland/grazingland
10. Length of ROW across cropland or pastureland with mobile irrigation systems
11. Number of pipeline crossings
12. Number of transmission line crossings
13. Number of U.S. and State highway crossings
14. Number of Farm-to-Market road crossings
15. Number of FAA-registered airports within 20,000 ft of ROW centerline
16. Number of private airstrips within 10,000 ft of ROW centerline
17. Number of heliports within 5,000 ft of ROW centerline
18. Number of commercial AM radio transmitters within 10,000 ft of ROW centerline
19. Number of FM radio transmitters, microwave and other electronic installations within 2,000 ft of ROW centerline

AESTHETICS

20. Estimated length of ROW within foreground visual zone[3] of U.S. and State highways
21. Estimated length of ROW within foreground visual zone[3] of Farm-to-Market roads
22. Estimated length of ROW within foreground visual zone[3] of parks/recreational areas[2]
23. Estimated length of ROW within foreground visual zone[3] of churches, schools, and cemeteries

ECOLOGY

24. Length of ROW across upland woodland
25. Length of ROW across bottomland/riparian woodland
26. Length of ROW across potential wetlands according to National Wetlands Inventory (NWI)
27. Length of ROW across known habitat of endangered or threatened species
28. Number of stream crossings
29. Length of ROW parallel to and within 100 ft of streams
30. Length of ROW across open water (lakes, ponds)
31. Length of ROW across 100-year floodplains

CULTURAL RESOURCES

32. Number of recorded historic or prehistoric sites crossed by ROW
33. Number of recorded historic or prehistoric sites within 1,000 ft of ROW centerline
34. Number of National Register-listed or determined-eligible sites crossed by ROW
35. Number of National Register-listed or determined-eligible sites within 1,000 ft of ROW centerline
36. Length of ROW across areas of high archaeological/historical site potential

[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.

Section 3.0

Environmental Setting

3.0 ENVIRONMENTAL SETTING

3.1 PHYSIOGRAPHY

The study area is located within a transitional zone between the Gulf Coastal Prairies and Interior Coastal Prairies subdivisions of the Gulf Coastal Prairies Physiographic Region of Texas (Figure 3-1). Low, relatively flat grasslands, forming nearly imperceptible southeasterly slopes toward the Gulf of Mexico, characterize the Coastal Prairies region. The Interior Coastal Plains is a geographic region that supports abundant pine and oak woodlands and is characterized by a gently rolling to level sandy terrain (Bureau of Economic Geology [BEG], 1996). Topographic relief consists of slopes ranging from 0 to 15% (Soil Conservation Service [SCS], now the Natural Resources Conservation Service [NRCS], 1988). USGS 7.5-minute quadrangle topographic maps indicate that surface elevations in the study area vary from about 150 ft above mean sea level (msl) on high terraces above Lake Livingston and the Trinity River, to less than 75 ft msl along the Trinity River, below the Lake Livingston Dam spillway.

The Polk and San Jacinto County typically experiences long, hot summers as a result of moist tropical air from the Gulf of Mexico persistently covering the area. The average annual temperature for Polk County and San Jacinto Counties is 67°F, with the temperature ranging from an average low of 36° F in January to an average high of 94°F in July. Winters are cool and fairly short, with only a rare cold wave that typically moderates in a couple of days. Average annual precipitation for Polk and San Jacinto counties is 48 inches and is distributed fairly evenly throughout the year, with summer precipitation consisting mainly of afternoon showers. The growing season lasts 250 days in Polk County, and 261 days in San Jacinto County. Prolonged droughts are rare (SCS, 1988; Texas State Historical Association [TSHA], 2008).

3.2 GEOLOGY

The Deweyville (Holocene) Formation is the dominant geologic formation mapped throughout the study area, with alluvial deposits mapped along the Trinity River. The Deweyville Formation and alluvium deposits are made up of sand, silt, clay, and some gravel, and include point bars, natural levees, stream channel, and backswamp deposits. In Alluvium, organic matter may be locally abundant in addition to sand, silt, and clay. Sand in the Deweyville formation is coarser than that in alluvium, and gravel is found mostly along the Trinity River. The surface is characterized by relict meanders of much larger radius of curvature than those of streams, with some scattered pimple mounds. Thickness is locally more than 50 ft (BEG, 1992).

Oil, gas, and possibly coal and iron ore are important geologic resources in Polk and San Jacinto counties. Oil and gas are produced from numerous wells throughout the study area counties and provide a major source of income to some landowners. Iron ore is mainly used as material for road surfacing. Lignite coal is present in the area; however, it is undeveloped (SCS, 1988).

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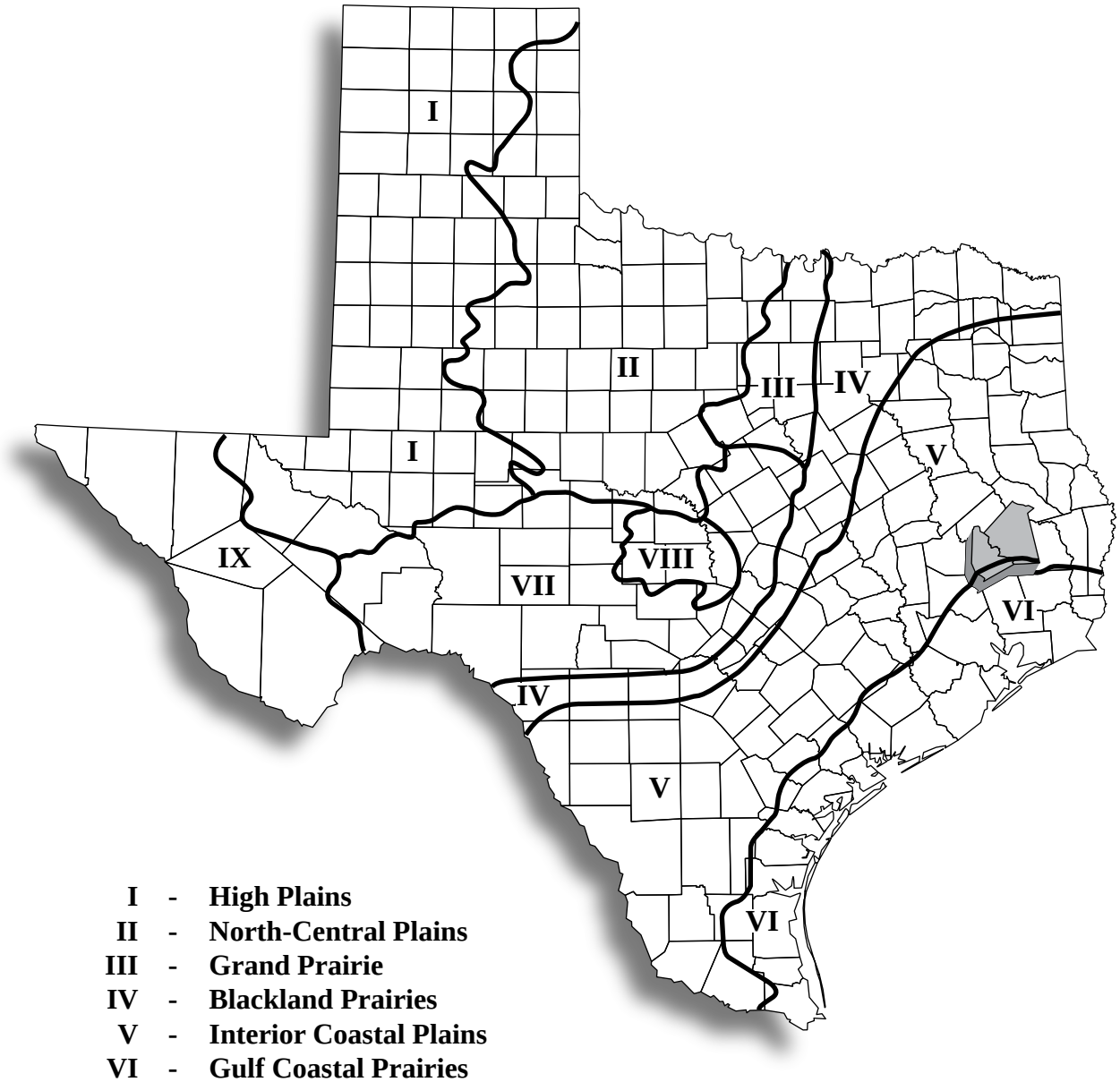

I - High Plains
II - North-Central Plains
III - Grand Prairie
IV - Blackland Prairies
V - Interior Coastal Plains
VI - Gulf Coastal Prairies
VII - Edwards Plateau
VIII - Central Texas Uplift
IX - Trans-Pecos Basin & Range

north

100 0 100

scale in miles

Source: BEG (1996)

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Figure 3-1

LOCATION OF POLK AND SAN JACINTO COUNTIES IN RELATION TO THE PHYSIOGRAPHIC PROVINCES OF TEXAS

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3.3 SOILS

3.3.1 General Soil Map Units

The study area occurs within Polk and San Jacinto counties. The General Soil Map and Soil Survey of Polk and San Jacinto Counties, Texas, published by the SCS (1988), was used to identify and briefly describe the general soil map units for the study area. The General Soil Map of Polk and San Jacinto counties shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each general soil map unit is a unique natural landscape, and typically consists of one or more major soils and some minor soils, and is named for the major soils. The soils making up one unit can occur in other units but in a different pattern. The General Soil Map Units mapped within the study area, and described below, include the Kaman-Hatliff-Nahatche unite, Bienville-Bernaldo-Spurger unit, and the Garner unit.

The Kaman-Hatliff-Nahatche soils occur on the floodplain of the Trinity River below Lake Livingston. These are nearly level to gently sloping, moderately well drained to poorly drained, very slowly permeable, moderately rapidly permeable, and moderately permeable, clayey and loamy soils. Half of this area rarely floods because of the protection provided by Lake Livingston; the remaining area floods mainly from runoff from tributary streams that enter the Trinity River. Approximately 14% are Kaman soils, 22% are Hatliff soils, 14% are Nahatche soils, and 17% are soils of minor extent. These soils are poorly suited to urban and recreation uses because of flooding, wetness, and high shrink-swell potential. Most areas that are rarely flooded are in pastures, and most areas that are frequently flooded are used as woodland.

The Bienville-Bernaldo-Spurger soils occur primarily on terraces of the Trinity River and are nearly level to strongly sloping, somewhat excessively drained to moderately well drained, moderately rapidly permeable, moderately permeable, and slowly permeable, sandy and loamy soils. Slopes range from 0 to 15%. The landscape is characterized by broad, nearly level, gently sloping, or gently undulating areas and some strong sloping side slopes. Approximately 49% are Bienville soils, 21% Bernaldo soils, 17% Spurger soils, and 13% are soils of minor extent. Most of these soils are suited to urban and recreation uses; however, in some places wetness, sandy surface layers, and slope are limitations to these uses. These soils are primarily used as pastureland and woodland.

The Garner soils also occur on the terraces of the Trinity River and are nearly level to gently sloping, poorly drained, very slowly permeable, clayey soils. Slopes range from 0 to 5%. The landscape is characterized by broad, nearly level to gently sloping areas. Approximately 80% are Garner soils and 20% are soils of minor extent. Most of the nearly level areas are in pastures. The more sloping areas are in woodland. The soils in this map unit are poorly suited to most urban and recreation uses because of the clay texture, shrink-well potential, and wetness.

3.3.2 Prime Farmland Soils

Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses (i.e., the land could be cropland, pastureland, rangeland, forest land or other land, but not developed land or land which is under water). It has the soil quality, growing season, and moisture supply necessary to economically produce sustained high yields of crops when treated and managed properly. The 10 specific criteria used to determine prime farmland status include (1) soil moisture, (2) soil temperature, (3) soil reaction (pH), (4) soil salinity, (5) exchangeable sodium, (6) flood hazard, (7) erosion, (8) slope, (9) permeability, and (10) rock content (SCS, 1978). Approximately 65.7% of the mapped soils in the study area are considered prime farmland soils. A further 5.5% of the mapped soils in the study area are considered prime farmland soils if drained. The remaining 28.8% of the mapped soils in the study area do not have a prime farmland rating (NRCS, 2008).

3.4 WATER RESOURCES

3.4.1 Surface Water

The study area is located entirely within the Trinity River Basin (TCEQ, 2008; Texas Water Development Board [TWDB], 2007), immediately adjacent to the east bank of the Trinity River, directly below the Lake Livingston Dam spillway. The Trinity River Basin is the largest river basin whose watershed area is entirely within the state of Texas and is the third-largest river in Texas by average flow volume. From its Elm and West forks near Dallas, the Trinity River flows to Trinity Bay, which drains to the Gulf of Mexico. Smaller streams within the basin include the Clear, East, Elm, and West forks of the Trinity River, and Cedar, Chambers, and Richland creeks (TWDB, 2007). Livingston Dam, owned by the City of Houston and the Trinity River Authority of Texas, is an earthfill dam with a concrete spillway with a crest elevation of 90 ft above msl. Lake Livingston reservoir has a normal capacity of 1,788,000 acre-feet, covers 82,000 acres, and drains an area of 16, 616 square miles. The reservoir is used for municipal, industrial, and irrigation purposes (TSHA, 2008). Over the past century, waters of the Trinity have become increasingly polluted from runoff containing pesticides and herbicides and dumping of industrial and human waste, particularly in the Dallas-Fort Worth area, resulting in deterioration of water quality. Efforts have been made to clean up the river, and a water quality management plan was adopted in the 1970s; however, in the early 1990s pollution problems continued (TSHA, 2008).

Long King Creek is the only perennial stream, other than the Trinity River, located in the study area. This Creek crosses the study area in the extreme east portion. Lake Livingston, Lake Livingston Dam and spillway, and the Trinity River each are located within the extreme western portions of the study area. Various small lakes and ponds are also scattered throughout the study area, including two named waterbodies: Baker Lake and Laurent Lake.

The NWI indicates and classifies several potential wetlands throughout the Blanchard, Camilla, Goodrich, and Livingston USGS 7.5-minute quadrangle areas. Within the study area, the NWI indicates emergent and forested wetlands occurring primarily in areas associated with the Trinity River, Long King Creek, Baker Lake, Laurent Lake, and other minor surface waters.

3.4.2 Floodplains

According to the FEMA detailed flood hazard boundary maps for Polk and San Jacinto counties, significant 100-year floodplains within the study area occur primarily along Trinity River and Lake Livingston, and Long King Creek. (FEMA, 1987a, 1987b). One hundred-year floodplains for streams in the project vicinity are shown on Figure 2-1 (map pocket).

3.4.3 Groundwater

The study area overlies the Gulf Coast Aquifer. This aquifer occupies an irregularly shaped belt along the Gulf of Mexico from Florida to Mexico. In Texas, the aquifer extends from the Rio Grande northeastward to the Louisiana-Texas border (TWDB, 1997). The aquifer is composed of the Catahoula, Fleming, Willis, Lissie, and Beaumont geologic formations. Thickness of this aquifer is an estimated 1,300 ft, and usable water can be found to a maximum depth of 3,200 ft. Generally, water produced from the Gulf Coast Aquifer is suitable for most uses (domestic livestock, public supply, industry, and irrigation purposes). Dissolved solids are less than 500 milligrams per liter (mg/L). Groundwater in the study area is used for domestic livestock, public supply, industry, and irrigation purposes. Public supply and industrial wells are primarily located near population centers, and domestic livestock and irrigation wells are primarily located in more rural areas, or areas where public supply is not available. Substantial overdrafts of groundwater from this aquifer have, in the past, caused land surface subsidence and potential encroachment of saline water. Groundwater is generally a limited resource within the Trinity River Basin. It was projected that in 2000, groundwater would make up only 10% of the water used within the Trinity River Basin (TWDB, 1997).

The stratigraphic column in the region that includes the study area has been differentiated into hydrologic units, having similar hydraulic properties and water quality characteristics. These hydrologic units are connected to form a large, leaky artesian aquifer system, which comprises four major components that are generally recognized as water-producing formations: the Catahoula, Jasper, Evangeline, and Chicot aquifers (TWDB, 1995). The classification of these formations agrees in part with geological subdivision of the section, as hydrologic unit boundaries often correspond with geologic formation boundaries. Recharge to these aquifers occurs from infiltration by precipitation on permeable strata in outcrop areas and from hydrostatic head conditions in down-gradient areas.

Contact between the aquifers is somewhat arbitrary, as significant hydraulic connection exists between them and their lithologies are quite similar. In general, however, differences in grain size, cementation, and compaction exist. Water quality within the aquifers follows the same general trend: as groundwater

flows downgradient from outcrop recharge areas, dissolved solids concentrations typically increase and the water generally changes from a calcium-bicarbonate type to a mix of either sodium-chloride/calcium-bicarbonate or sodium-chloride/sodium-bicarbonate type.

3.5 VEGETATION

3.5.1 Regional Vegetation

The study area lies within the Pineywoods vegetational area as delineated by Gould et al. (1960) shown on Figure 3-2. The Pineywoods ecological region of Texas, as described by Vines (1960) and Hatch et al. (1990), comprises approximately 15 million acres of gently rolling to hilly, forested land. Extensive pine and mixed pine/hardwood forests, scattered swamps, and increasing amounts of cultivated land and pastureland characterize the vegetation communities in the area. Timber production is a primary industry in the region and is responsible for the establishment of various age classes of regrowth hardwood and pine forests. The soils of the Pineywoods region are generally light colored to dark gray sand or sandy loams, which generally support a greater proportion of pines than hardwoods.

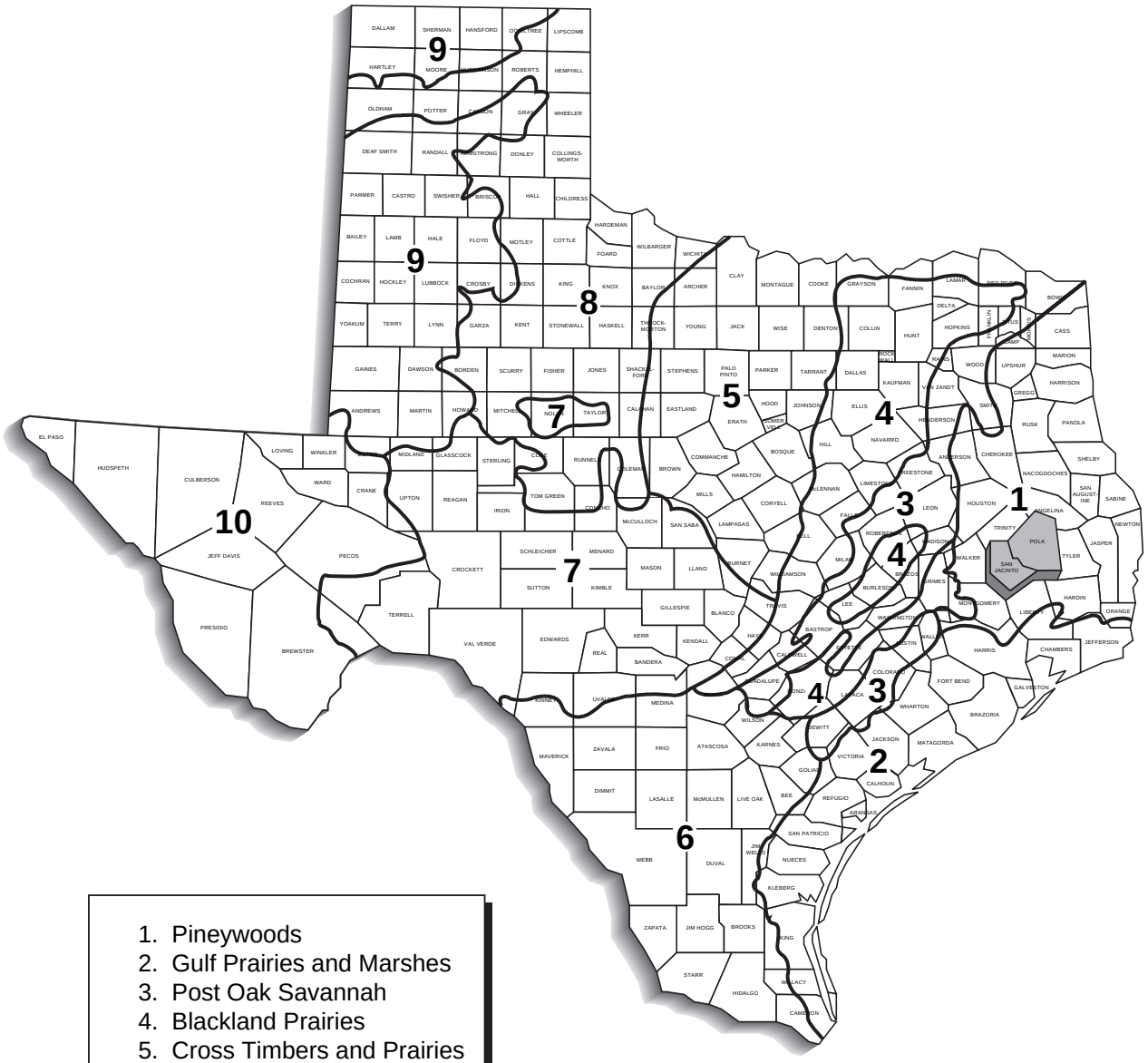
The study area is part of what was once a vast region known as the Big Thicket, which encompassed roughly 15 counties and over 3,000,000 acres of diverse woodlands (Ajilvsgi, 1979). Farming, lumbering, oil production, and other land uses have significantly fragmented this region. Remnants of virgin forests that remain are mostly restricted to remote, nearly inaccessible swamps. Small portions of the region, including some of these remnant areas, have been established as the Big Thicket National Preserve and comprise 12 preserve units. These preserve units are located northeast of the study area. Several national forests are located within the Pineywoods ecological region, including the Sam Houston National Forest, Davy Crockett National Forest, Angelina National Forest, and Sabine National Forest. The Sam Houston National Forest is located approximately 12 miles north of the study area.

3.5.2 Vegetation in the Study Area

Vegetation community types occurring in the study area include upland woodland, bottomland/riparian woodland, grassland (including pasture/grazingland), cutover/regenerative areas, and hydric and aquatic communities. Grassland dominates the study area, with upland and bottomland/riparian woodlands occurring in the south and southeast portions of the study area. A brief description of the vegetation communities present in the study area is presented below.

3.5.2.1 Upland Woodland

The upland woodland vegetation type composes a small percentage of the study area. This vegetation type is often represented by mixed pine-hardwood forest communities. The density of the canopy coverage and pine needle litter typically excludes the occurrence of many herbaceous species. The structure of these forests varies greatly depending upon management practices, successional status, and historical factors.



1. Pineywoods
2. Gulf Prairies and Marshes
3. Post Oak Savannah
4. Blackland Prairies
5. Cross Timbers and Prairies
6. South Texas Plains
7. Edwards Plateau
8. Rolling Plains
9. High Plains
10. Trans-Pecos

north

100 0 100 200

scale in miles

Source: Hatch et al. (1990)

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Figure 3-2

LOCATION OF POLK AND SAN JACINTO COUNTIES IN RELATION TO THE VEGETATIONAL AREAS OF TEXAS

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Pine forests are generally comprised of even-aged loblolly pine. Some of the more managed stands have been subjected to selective cutting, and thinning of both hardwoods and young pines, while other stands have been left undisturbed. Vegetation that typically occupies upland woodland is listed in Table 3-1.

TABLE 3-1

PLANTS COMMONLY ASSOCIATED WITH THE UPLAND WOODLAND VEGETATION TYPE[1]

Common Name[2]	Scientific Name[2]
TREES	
Eastern red-cedar	*Juniperus virginiana*
Short-leaf pine	*Pinus echinata*
Longleaf pine	*Pinus palustris*
Loblolly pine	*Pinus taeda*
White oak	*Quercus alba*
Southern red oak	*Quercus falcata*
Black-jack oak	*Quercus marilandica*
Water oak	*Quercus nigra*
Post oak	*Quercus stellata*
Sweetgum	*Liquidambar styraciflua*
Black hickory	*Carya texana*
Black walnut	*Juglans nigra*
Sassafras	*Sassafras albidum*
Hawthorns	*Crataegus* spp.
UNDERSTORY SHRUBS/WOODY VINES	
Poison-ivy	*Toxicodendron radicans*
Japanese honeysuckle	*Lonicera japonica*
Flowering dogwood	*Cornus florida*
Eastern redbud	*Cercis canadensis*
Chinese privet	*Ligustrum sinense*
Alabama supplejack	*Berchemia scandens*
Pepper-vine	*Ampelopsis arborea*
Virginia creeper	*Parthenocissus quinquefolila*
Grapes	*Vitis* spp.
Greenbriers	*Smilax* spp.
HERBACEOUS	
Tickclover	*Desmodium* spp.
Broad-leaf woodoats	*Chasmanthium sessiliflorum*
Love-grass	*Eragrostis* spp.
Panic-grass	*Panicum* spp.
Little bluestem	*Schizachyrium scoparium*

[1]According to Gould (1978), Hatch et al. (1990), McMahan et al. (1984) Nixon and Cunningham (2000), and Vines (1977).

[2]Nomenclature and taxonomic order follows Jones and Wipff (2003).

3.5.2.2 Bottomland/Riparian Woodland

The bottomland/riparian woodland vegetation type generally consists of two forest types that are similar in terms of species composition and certain edaphic (soil) and hydrologic factors, but that differ in extent due to floodplain characteristics. A dense overstory canopy and a well-developed understory and shrub layer characterize bottomland forest stands, which occur where floodplains are wide along permanent and intermittent streams. Riparian forest stands generally occur in narrow floodplains of minor streams, and are thereby limited to narrow bands of woody vegetation immediately adjacent to the streams. The relatively tall overstory canopy of bottomland/riparian woodland typically includes numerous tree species, most of which are deciduous. Table 3-2 lists plants commonly associated with bottomland/riparian woodland.

TABLE 3-2

PLANTS COMMONLY ASSOCIATED WITH THE BOTTOMLAND/RIPARIAN WOODLAND[1]

Common Name[2]	Scientific Name[2]
TREES	
Swamp red maple	*Acer rubrum*
River birch	*Betula nigra*
American hornbeam	*Carpinus caroliniana*
Hop-hornbeam	*Ostrya virginiana*
American beech	*Fagus grandifolia*
Water oak	*Quercus nigra*
Willow oak	*Quercus phellos*
Swamp laurel-leaf oak	*Quercus laurifolia*
Over-cup oak	*Quercus lyrata*
Bitternut hickory	*Carya cordiformes*
Blackgum	*Nyssa sylvatica*
Green ash	*Fraxinus pennsylvanica*
Texas sugarberry	*Celtis laevigata*
American elm	*Ulmus americana*
UNDERSTORY SHRUBS/WOODY VINES	
Poison-ivy	*Toxicodendron radicans*
Deciduous holly	*Ilex decidua*
American holly	*Ilex opaca*
Black ti-ti	*Cyrilla racemiflora*
Indigobush	*Amorpha fruticosa*
Drummond's rattlebush	*Sesbania drummondi*
Wax-myrtle	*Morella cerifera*
Common buttonbush	*Cephalanthus occidentalis*
Greenbriers	*Smilax spp.*
HERBACEOUS	
Sensitive fern	*Onoclea sensibilis*
Giant ragweed	*Ambrosia trifida*

TABLE 3-2 (Concluded)

Common Name[2]	Scientific Name[2]
Dwarf palmetto	*Sabal minor*
Sedges	*Cyperus* spp.
Soft rush	*Juncus effusus*
Bushy bluestem	*Andropogon glomeratus*
Giant cane	*Arundinaria gigantea*
Virginia wild rye	*Elymus virginicus*
Panic-grass	*Panicum* spp.

[1]According to Gould (1978), Hatch et al. (1990), Hatch and Pluhar (1993), McMahan et al. (1984), Nixon and Cunningham (2000), and Vines (1977).
[2]Nomenclature and taxonomic order follows Jones and Wipff (2003).

3.5.2.3 Grassland

The grassland vegetation type dominates the study area and consists of pastures, oldfields, residential and commercially developed areas, and road, transmission line, and pipeline ROW. These areas typically support a variety of grasses, forbs, and woody species. Plants commonly associated with the grasslands are listed in Table 3-3.

TABLE 3-3

PLANTS COMMONLY ASSOCIATED WITH GRASSLAND[1]

Common Name[2]	Scientific Name[2]
WOODY PLANTS	
Sumac	*Rhus* spp.
Common persimmon	*Diospyros virginiana*
Southern dewberry	*Rubus trivialis*
GRASSES	
Splitbeard bluestem	*Andropogon tenarius*
Three-awn	*Aristida* spp.
Brome	*Bromus* spp.
Bermudagrass	*Cynodon dactylon*
Lovegrass	*Eragrostis* spp.
Panicgrass	*Panicum* spp.
Little bluestem	*Schizachyrium scoparium*
Knot-root bristle-grass	*Setaria firmula*
Johnsongrass	*Sorghum halapense*
FORBS	
Texas thistle	*Cirsium texanum*
Goldenrod	*Solidago* spp.
Croton	*Croton* spp.

TABLE 3-3 (Concluded)

Common Name[2]	Scientific Name[2]
Bush clover	*Lespedeza* spp.
Texas bluebonnet	*Lupinus texensis*
Clover	*Trifolium* spp.

[1]According to Gould (1978), Hatch et al. (1990), Hatch and Pluhar (1993), and McMahan et al. (1984).
[2]Nomenclature and taxonomic order follows Jones and Wipff (2003).

3.5.2.4 Cutover/Regenerative Areas

The cutover/regenerative vegetation type occurs primarily as a result of clearing activities for commercial and residential development, and roadway and utility line ROW. Outside of more developed areas, cutover/regenerative areas occur where logging activity has recently occurred. In the absence of land management practices, woody species that were present prior to clearing, and certain invasive plant species, tend to populate these disturbed areas. The species composition of these areas varies somewhat depending upon factors such as topography, soils, hydrology, and the type of disturbance that the site has undergone, as well as the composition of surrounding vegetation. Much of the developed areas are managed, supporting native and landscape species. As a result of clearing openings in the overstory canopy, the increase in light penetration to the lower strata typically promotes a dense cover of grasses, forbs, shrubs, and saplings of overstory species. While pines, oaks, and other hardwoods are the typical, dominant trees in this community, other invasive species may also occur. Table 3-4 lists plants commonly associated with cutover/regenerative areas.

TABLE 3-4

PLANTS COMMONLY ASSOCIATED WITH CUTOVER/REGENERATIVE AREAS[1]

Common Name[2]	Scientific Name[2]
TREES	
Eastern redcedar	*Juniperus virginiana*
Short-leaf pine	*Pinus echinata*
Loblolly pine	*Pinus taeda*
Flame-leaf sumac	*Rhus copallinumj*
Eastern baccharis	*Baccharis halimifolia*
Blackjack oak	*Quercus marilandica*
Southern red oak	*Quercus stellata*
Sweet gum	*Liquidambar styraciflua*
Chinese tallow	*Sapium sebiferum*
Winged elm	*Ulmus alata*
VINES	
Southern dewberry	*Rubus trivialis*
Greenbrier	*Smilax* spp.

TABLE 3-4 (Concluded)

Common Name[2]	Scientific Name[2]
GRASSES AND FORBS	
Western ragweed	*Ambrosia psilostachya*
Goldenrod	*Solidago* spp.
Croton	*Croton* spp.
Showy partridge-pea	*Chamaecrista fasiculata*
Broom-sedge bluestem	*Andropogon virginicus*
Oldfield threeawn	*Aristida oligantha*
Rescue grass	*Bromus unioloides*
Panic-grass	*Panicum* spp.
Johnson-grass	*Sorghum halapense*

[1]According to Hatch et al. (1990), Hatch and Pluhar (1993), Gould (1978), McMahan et al. (1984), Nixon and Cunningham (2000), and Vines (1977).
[2]Nomenclature and taxonomic order follows Jones and Wipff (2003).

3.5.2.5 Hydric Communities

Hydric plant communities are composed of hydrophytes (plants adapted to areas deficient in oxygen as a result of excessive water content) typically associated with swamps, bogs, ponds, wet meadows, and marshes. These plant communities commonly occur along ditches, streams, lake fringes, ponds, canals, and in low depressions in oldfields, wet meadows, and pastures. Hydric communities sometimes, but not always, include bottomland/riparian woodland. Because of the combination of climatic, topographic, and edaphic factors that occur in the region, hydric communities are fairly common in the vicinity of the study area. Plants commonly associated with hydric communities are listed in Table 3-5. Vegetation associated with bottomland/riparian woodland is described and listed in Section 3.5.2.2.

TABLE 3-5

PLANTS COMMONLY ASSOCIATED WITH HYDRIC COMMUNITIES[1]

Common Name[2]	Scientific Name[2]
TREES	
Bald cypress	*Taxodium distichum*
Black willow	*Salix nigra*
Swamp red maple	*Acer rubrum*
River birch	*Betula nigra*
Water tupelo	*Nyssa aquatica*
SHRUBS	
Black ti-ti	*Cyrilla racemiflora*
Drummond's rattlebush	*Sesbania drummondii*
Wax-myrtle	*Morella cerifera*
Common buttonbush	*Cephalanthus occidentalis*

TABLE 3-5 (Concluded)

Common Name[2]	Scientific Name[2]
HERBACEOUS	
Water penny-wort	*Hydrocotyle bonariensis*
Swamp smartweed	*Polygonum* hydropiperoides.
Caric-sedge	*Carex* spp.
Flat-sedge	*Cyperus* spp.
Spike-sedge	*Kyllinga* spp.
Soft rush	*Juncus* effusus.
Bushy bluestem	*Andropogon glomeratus*
Giant cane	*Arundinaria gigantea*
Pickerelweed	*Pontederia cordata*
Water hyacinth	*Eichhornia crassipes*
Broad-leaf cattail	*Typha latifolia*

[1]According to Hatch et al. (1990), Hatch and Pluhar (1993), Gould (1978), McMahan et al. (1984), Nixon and Cunningham (2000), Stutzenbaker (1999), and Vines (1977).
[2]Nomenclature and taxonomic order follows Jones and Wipff (2003).

3.5.3 Commercially Important Plant Species

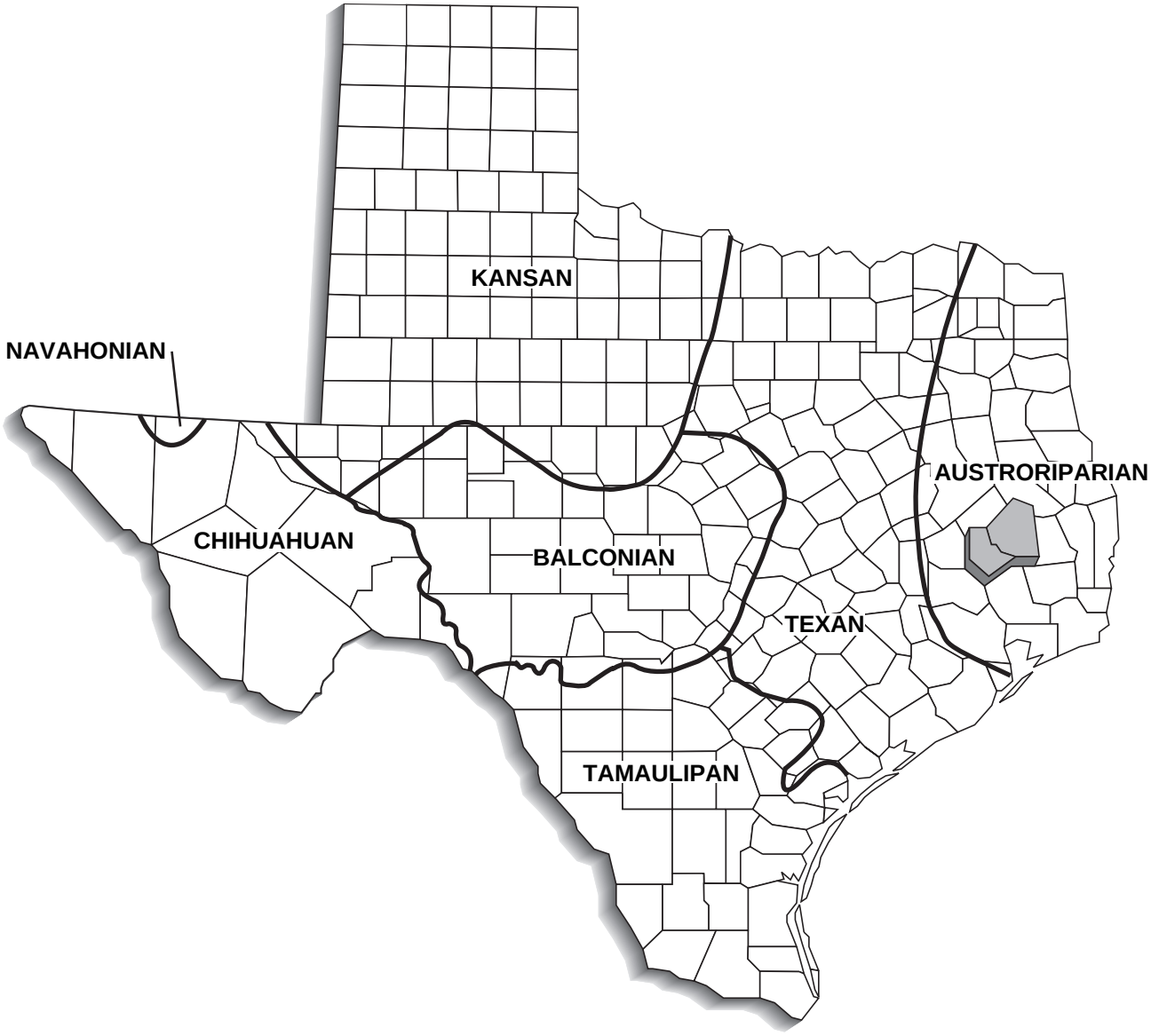
Commercially important plant species in the study area are primarily those related to timber production. The most significant commercial plant species in the study area are pines, which are valued as harvestable timber for commercial wood production. Other important species may also include hardwoods (e.g., oaks, elms, hickories, and pecan), cultivated row crops, and hay-crop species.

3.6 FISH AND WILDLIFE

As indicated in Figure 3-3, Polk and San Jacinto counties are situated within the Austroriparian Biotic Province, which stretches from the Pineywoods of eastern Texas through the southeastern United States to the Atlantic Ocean (Blair, 1950). Extensive pine and hardwood forests, swamps, marshes and other hydric communities, characterize the Austroriparian Biotic Province. In Texas, at least 47 species of mammals, 29 species of snakes, 2 land turtles, 10 lizards, and 35 species of amphibians are known from the Austroriparian Biotic Province (Blair, 1950). The study area is located within the southwestern portion of this biotic province and vertebrate fauna in the region is typical of that found over most of the Austroriparian Biotic Province to the northeast. No endemic wildlife species occur within the study area.

3.6.1 Wildlife Habitats and Species

Habitat is a concept that is related to a particular species and is an area with a combination of resources (food, cover, water) and environmental conditions (temperature, precipitation, presence or absence of predators and competitors) that promotes occupancy by individuals of a given species (or population) and allows those individuals to survive and reproduce. Habitat is organism-specific and relates the presence of



north

100 0 100 200

scale in miles

Source: Blair (1950)

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• Engineering
• Environmental Consulting
• Surveying

Figure 3-3

LOCATION OF POLK AND SAN JACINTO COUNTIES IN RELATION TO THE BIOTIC PROVINCES OF TEXAS

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a species, population, or individual plant or animal to an area's physical and biological characteristics Morrison et al. (1998). Habitat implies more than vegetation or vegetation structure; it is the sum of the specific resources needed by organisms (Hall et al., 1997). Important elements of the habitat of an animal often are provided by the vegetation in an area. Changes in vegetation can alter habitat conditions, and structure and composition of vegetation influence habitat quality (Morrison et al., 1998).

Overlapping of wildlife habitat occurs when two or more species, or populations, utilize the same resources. Some species' habitats are restricted to woodland vegetation types; however, other species habitats include multiple vegetation types.

"Edge" or "ecotone" is often described as the intersection of two vegetation types (Morrison et al., 1998) and typically creates an "edge effect" that provides a diversity of food and cover that is often utilized and preferred by "edge" species. The "edge" concept, however, is not always viewed as an overriding positive feature, as increasing edge beyond natural levels leads to fragmented environments, which may cause increased predation and increased rates of avian nest parasitism (Morrison et al., 1998). Some species, such as grassland birds avoid wooded edges, as nest predation and parasitism rates are usually highest in these areas (Johnson and Temple, 1986; Paton, 1994; Winter et al., 2000; Dixon et al., 2008).

The study area can be divided into several major vegetation types (i.e., vegetation associations, plant communities, etc.), which support the various wildlife habitats present and influence wildlife habitat quality. Section 3.5.2 presents descriptions of the vegetation types that provide the vegetation element of wildlife habitats throughout the study area. Vegetation community types as discussed in Section 3.5.2 as occurring in the study area include upland woodland, bottomland/riparian woodland, grassland (including pasture/grazingland), cutover/regenerative areas, and hydric and aquatic communities. Grassland dominates the study area, with upland and bottomland/riparian woodlands occurring in the south and southeast portions of the study area. Characteristic wildlife species potentially occurring in the study area are addressed below.

3.6.1.1 Amphibians and Reptiles

According to Blair (1950), the Austroriparian Biotic Province supports more species of urodeles (salamanders and newts) than any other biotic province in the state with at least 18 species having occurred in recent times. At least 29 species of snakes, 10 lizards, 2 land turtles, 17 anurans (frogs and toads) are also known from the Austroriparian Biotic Province from recent times. Table 3-6 lists common amphibian and reptile species of potential occurrence in the study area, based on county records and range limits.

TABLE 3-6

COMMON AMPHIBIAN AND REPTILE SPECIES OF POTENTIAL OCCURRENCE IN THE STUDY AREA[1]

Common Name[2]	Scientific Name[2]
FROGS AND TOADS	
Blanchard's cricket frog	*Acris crepitans blanchardi*
Gulf Coast toad	*Bufo nebulifer*
East Texas toad	*Bufo woodhousii velatus*
Cope's gray tree frog	*Hyla chrysoscelis*
Gray tree frog	*Hyla versicolor*
Green tree frog	*Hyla cinerea*
Eastern narrow-mouthed toad	*Gastrophryne carolinensis*
Great Plains narrow-mouthed toad	*Gastrophryne olivacea*
Northern spring peeper	*Pseudacris crucifer crucifer*
American bullfrog	*Rana catesbeiana*
Bronze frog	*Rana clamitans clamitans*
Plains leopard frog	*Rana blairi*
Southern leopard frog	*Rana sphenocephala utricularia*
Hurter's spadefoot	*Scaphiopus hurterii*
NEWTS, SIRENS, SALAMANDERS	
Spotted salamander	*Ambystoma maculatum*
Marbled salamander	*Ambystoma opacum*
Small-mouthed salamander	*Ambystoma texanum*
Eastern tiger salamander	*Ambystoma tigrinum tigrinum*
Three-toed amphiuma	*Amphiuma tridactylum*
Southern dusky salamander	*Desmognathus auriculatus*
Central newt	*Notophthalmus viridescens louisianensis*
Western lesser siren	*Siren intermedia nettingi*
LIZARDS	
Green anole	*Anolis carolinensis*
Six-lined race runner	*Cnemidophorus sexlineatus sexlineatus*
Five-lined skink	*Eumeces fasciatus*
Broad-headed skink	*Eumeces laticeps*
Western slender glass lizard	*Ophisaurus attenuatus attenuatus*
Northern fence lizard	*Sceloporus undulatus hyacinthinus*
Little brown skink	*Scincella lateralis*
SNAKES	
Southern copperhead	*Agkistrodon contortrix contrortrix*
Western cottonmouth	*Agkistrodon piscivorus leucostoma*
Buttermilk racer	*Coluber constrictor anthicus*
Corn snake	*Elaphe guttata guttata*
Texas ratsnake	*Elaphe obsoleta*
Eastern hog-nosed snake	*Heterodon platirhinos*
Prairie kingsnake	*Lampropeltis calligaster calligaster*

TABLE 3-6 (Concluded)

Common Name[2]	Scientific Name[2]
Speckled kingsnake	*Lampropeltis geluta holbrooki*
Louisiana milk snake	*Lampropeltis triangulum amaura*
Eastern coachwhip	*Masticophis flagellum flagellum*
Texas coral snake	*Micrurus tener*
Broad-banded watersnake	*Nerodia fasciata confluens*
Diamond-backed watersnake	*Nerodia rhombifer rhombifer*
Rough greensnake	*Opheodrys aestivus*
Graham's crayfish snake	*Regina grahamii*
Western pygmy rattlesnake	*Sistrurus miliarius streckeri*
Texas brown snake	*Storeria dekayi texana*
Flatheaded snake	*Tantilla gracilis*
Western ribbon snake	*Thamnophis proximus proximus*
Rough earthsnake	*Virginia striatula*
TURTLES	
Pallid spiny softshell	*Apalone spinifera pallida*
Snapping turtle	*Chelydra serpentina*
Yellow mud turtle	*Kinosternon flavescens*
Mississippi mud turtle	*Kinosternon subrubrum hippocrepis*
Eastern river cooter	*Pseudemys concinna concinna*
Stinkpot	*Sternothorus odoratus*
Three-toed box turtle	*Terrapene carolina triunguis*
Ornate box turtle	*Terrapene ornata ornata*
Red-eared slider	*Trachemys scripta elegans*

[1]According to Dixon (2000), Bartlett and Bartlett (1999), Werler and Dixon (2000), and Dixon and Werler (2005).
[2]Nomenclature and taxonomic order follows Crother et al. (2000, 2001, and 2003).

3.6.1.2 Birds

The region supports an abundant and diverse avifauna including many year-round residents, summer residents/migrants, and winter residents/migrants. Table 3-7 lists common avian species of potential occurrence in the study area, based on known county records and region and/or local species checklists.

Species encountered in the study area during the March field visit include year-round residents such as the great blue heron, great egret, black vulture, turkey vulture, bald eagle, American coot, killdeer, rock pigeon, Eurasian collared-dove, mourning dove, white-eyed vireo, American crow, northern mockingbird, European starling, pine warbler, northern cardinal, red-winged blackbird, great-tailed grackle, brown-headed cowbird, and house sparrow. Also encountered in the study area were winter residents/migrants such as the American white pelican, double-crested cormorant, laughing gull, ring-billed gull, Forster's tern, and savannah sparrow; and summer residents/migrants such as the scissor-tailed flycatcher, purple martin, and barn swallow.

TABLE 3-7

COMMON AVIAN SPECIES OF POTENTIAL OCCURRENCE IN THE STUDY AREA[1]

Common Name[2]	Scientific Name[2]
YEAR-ROUND RESIDENTS	
Wood duck	*Aix sponsa*
Pied-billed grebe	*Podilymbus podiceps*
Great blue heron	*Ardea herodias*
Great egret	*Ardea alba*
Black vulture	*Coragyps atratus*
Turkey vulture	*Cathartes aura*
Bald eagle	*Haliaeetus leucocephalus*
Red-shouldered hawk	*Buteo lineatus*
American coot	*Fulica americana*
Killdeer	*Charadrius vociferus*
Rock pigeon	*Columba livia*
Eurasian collared-dove	*Streptopelia decaocto*
Mourning dove	*Zenaida macroura*
Eastern screech-owl	*Megascops asio*
Barred owl	*Strix varia*
Red-bellied woodpecker	*Melanerpes carolinus*
Downy woodpecker	*Picoides pubescens*
White-eyed vireo	*Vireo griseus*
Blue jay	*Cyannocitta cristata*
American crow	*Corvus brachyrhynchos*
Carolina chickadee	*Poecile carolinensis*
Tufted titmouse	*Baeolophus bicolor*
Carolina wren	*Thryothorus ludovicianus*
Northern mockingbird	*Mimus polyglottos*
European starling	*Sturnus vulgaris*
Pine warbler	*Dendroica pinus*
Northern cardinal	*Cardinalis cardinalis*
Red-winged blackbird	*Agelaius phoeniceus*
Eastern meadowlark	*Sturnella magna*
Common grackle	*Quiscalus quiscula*
Great-tailed grackle	*Quiscalus mexicanus*
Brown-headed cowbird	*Molothrus ater*
House sparrow	*Passer domesticus*
WINTER RESIDENTS/MIGRANTS	
Snow goose	*Chen caerulescens*
Gadwall	*Anas strepera*
American wigeon	*Anas americana*
Mallard	*Anas platyrhynchos*
Blue-winged teal	*Anas discors*
Green-winged teal	*Anas crecca*

TABLE 3-7 (Cont'd)

Common Name[2]	Scientific Name[2]
Canvasback	*Aythya valisineria*
Ring-necked duck	*Aythya collaris*
Lesser scaup	*Aythya affinis*
Bufflehead	*Bucephala albeola*
Ruddy duck	*Oxyura jamaicensis*
American white pelican	*Pelecanus erythrorhynchos*
Double-crested cormorant	*Phalacrocorax auritus*
Northern harrier	*Circus cyaneus*
Sharp-shinned hawk	*Accipiter striatus*
Lesser yellowlegs	*Tringa flavipes*
Solitary sandpiper	*Tringa solitaria*
Spotted sandpiper	*Actitis macularius*
Least sandpiper	*Calidris minutilla*
Pectoral sandpiper	*Calidris melanotos*
Wilson's snipe	*Gallinago delicata*
Laughing gull	*Larus atricilla*
Bonaparte's gull	*Larus philadelphia*
Ring-billed gull	*Larus delawarensis*
Forster's tern	*Sterna forsteri*
Golden-crowned kinglet	*Regulus satrapa*
Ruby-crowned kinglet	*Regulus calendula*
Hermit thrush	*Catharus guttatus*
American pipit	*Anthus rubescens*
Cedar waxwing	*Bombycilla cedrorum*
Yellow-rumped warbler	*Dendroica coronata*
Field sparrow	*Spizella pusilla*
Savannah sparrow	*Passerculus sandwichensis*
Song sparrow	*Melospiza melodia*
Swamp sparrow	*Melospiza georgiana*
White-throated sparrow	*Zonotrichia albicollis*
Dark-eyed junco	*Junco hyemalis*
Pine siskin	*Carduelis pinus*
American goldfinch	*Carduelis tristis*
SUMMER RESIDENTS/MIGRANTS	
Little blue heron	*Egretta caerulea*
Cattle egret	*Bubulcus ibis*
Green heron	*Butorides virescens*
Broad-winged hawk	*Buteo platypterus*
Yellow-billed cuckoo	*Coccyzus americanus*
Common nighthawk	*Chordeiles minor*
Chimney swift	*Chaetura pelagica*
Ruby-throated hummingbird	*Archilochus colubris*

TABLE 3-7 (Concluded)

Common Name[2]	Scientific Name[2]
Eastern wood pewee	*Contopus virens*
Acadian flycatcher	*Empidonax virescens*
Great crested flycatcher	*Myiarchus crinitus*
Eastern kingbird	*Tyrannus tyrannus*
Red-eyed vireo	*Vireo olivaceus*
Purple martin	*Progne subis*
Barn swallow	*Hirundo rustica*
Wood thrush	*Hylocichla mustellina*
Northern parula	*Parula americana*
Prothonotary warbler	*Protonotaria citrea*
Hooded warbler	*Wilsonia citrina*
Yellow-breasted chat	*Icteria virens*
Summer tanager	*Piranga rubra*
Blue grosbeak	*Passerina caerulea*
Indigo bunting	*Passerina cyanea*
Painted bunting	*Passerina ciris*
Dickcissel	*Spiza americana*

[1]According to Wolf et al. (2001), and Lockwood and Freeman (2004).
[2]Nomenclature and taxonomic order follows American Ornithologists' Union (AOU, 1998, 2000, 2002, 2003, 2004, 2005, 2006, 2007).

3.6.1.3 Mammals

At least 47 mammal species occur or have occurred in recent times in the Austroriparian Biotic Province Five of these species apparently reach their western limits in this province in eastern Texas (Blair, 1950). Table 3-8 provides a representative list of common mammalian species of potential occurrence in the study area, based on known county records and range maps.

TABLE 3-8

COMMON MAMMAL SPECIES OF POTENTIAL OCCURRENCE IN THE STUDY AREA[1]

Common Name[2]	Scientific Name[2]
OPOSSUMS	
Virginia opossum	*Didelphis virginiana*
INSECTIVORES	
Southern short-tailed shrew	*Blarina carolinensis*
Least shrew	*Cryptotis parva*
Eastern mole	*Scalopus aquaticus*
BATS	
Southeastern myotis	*Myotis austroriparius*
Eastern red bat	*Lasiurus borealis*

TABLE 3-8 (Concluded)

Common Name[2]	Scientific Name[2]
Hoary bat	*Lasiurus cinereus*
Seminole bat	*Lasiurus seminolus*
Eastern pipestrelle	*Pipistrellus subflavus*
Big brown bat	*Eptesicus fuscus*
Evening bat	*Nycticeius humeralis*
Brazilian free-tailed bat	*Tadarida brasiliensis*
ARMADILLOS	
Nine-banded armadillo	*Dasypus novemcinctus*
RABBITS	
Swamp rabbit	*Sylvilagus aquaticus*
Eastern cottontail	*Sylvilagus floridanus*
RODENTS	
Eastern gray squirrel	*Sciurus carolinensis*
Eastern fox squirrel	*Sciurus niger*
Southern flying squirrel	*Glaucomys volans*
Baird's pocket gopher	*Geomys breviceps*
American beaver	*Castor canadensis*
Marsh rice rat	*Orzyomys palustris*
Fulvous harvest mouse	*Reithrodontomys fulvescens*
Cotton mouse	*Peromyscus gossypinus*
White-footed mouse	*Peromyscus leucopus*
Deer mouse	*Peromyscus maniculatus*
Northern pygmy mouse	*Baiomys taylori*
Hispid cotton rat	*Sigmodon hispidus*
Eastern woodrat	*Neotoma floridana*
House rat	*Rattus rattus*
House mouse	*Mus musculus*
CARNIVORES	
Coyote	*Canis latrans*
Common gray fox	*Urocyon cinereoargenteus*
Northern raccoon	*Procyon lotor*
American badger	*Taxidea taxus*
Striped skunk	*Mephitis mephitis*
Bobcat	*Lynx rufus*
UNGULATES	
Feral pig	*Sus scrofa*
White-tailed deer	*Odocoileus virginianus*

[1]According to Schmidly (2004).

[2]Nomenclature and taxonomic order follows Baker et al. (2003).

3.6.2 Recreationally and Commercially Important Wildlife Species

Numerous wildlife species that provide human benefits occur within the study area. These benefits result from both consumptive and nonconsumptive utilization of wildlife resources. Activities such as wildlife photography and bird watching are considered nonconsumptive uses. Although these uses are difficult to quantify, they are considered in the evaluation of the wildlife resources in the study area. Consumptive uses, such as hunting and trapping, are more easily quantifiable and are often enjoyed in conjunction with nonconsumptive uses. All wildlife in the study area provides the potential for nonconsumptive benefits, and many species of mammals and birds occurring in the study area provide consumptive uses. These species represent a particularly important recreational and economic resource.

The white-tailed deer (*Odocoileus virginianus*) is the most economically important big game mammal in Texas (Schmidly, 2004). Nearly 50,000 white-tailed deer were harvested in the Pineywoods ecoregion during the 2005-2006 hunting season (Purvis, 2007a). Basic habitat requirements of white-tailed deer are food, cover, space, and water. Optimum habitat for white-tailed deer consists of a mosaic of vegetation dominated by woody plants and vegetation dominated by herbaceous plants interspersed within the landscape. White-tailed deer tend to consume a wide variety of plant species and plant parts including leaves, stems, fruits, and seeds. Plants eaten by white-tailed deer can be placed in the general categories of browse, forbs, grasses, grass-likes, lichens, mast and succulents (Fulbright and Ortega-S, 2006).

Other game species regularly hunted within the Pineywoods region are the northern bobwhite (*Colinus virginianus*), mourning dove (*Zenaida macroura*), rabbits, squirrels, American woodcock (*Scolopax minor*), and numerous species of migratory waterfowl (Purvis, 2007b). Fox squirrels (*Sciurus niger*) and gray squirrels (*Sciurus carolinensis*) are important small game mammals over much of the state, particularly to the east. Oak mast provides the bulk of the diet of both species. The mourning dove is the most widespread and abundant game bird in Texas. These birds are often found in semi-open country and edges, but are also common in heavily wooded and cultivated areas. Within the study area, doves are typically one of the most common bird species encountered. Waterfowl hunting is also a popular recreation in Texas. Large numbers of ducks migrate through the study area and overwinter in or near the study area.

Furbearers (e.g., common raccoon [*Procyon lotor*], beaver [*Castor canadensis*], nutria [*Myocastor coypus*], Virginia opossum [*Didelphis virginiana*], red fox [*Vulpes vulpes*], common gray fox [*Urocyon cinereoargenteus*], striped skunk [*Mephitis mephitis*], bobcat [*Lynx rufus*], coyote [*Canis latrans*], and mink [*Mustela vison*]) are of some economic and recreational importance in Texas. Generally, furbearers are more abundant in woodlands, especially bottomland forests. Texas Parks and Wildlife Department (TPWD) data show the common raccoon, striped skunk, Virginia opossum, common gray fox, coyote, and bobcat to be the most commonly observed furbearers in the Pineywoods region (McGinty and Frisbie, 2001).

3.6.3 Fish Habitats and Species

The study area is located in the Trinity River Basin and includes Lake Livingston and the Trinity River below Lake Livingston Dam. Other minor waterbodies in the study area include Baker Lake, Laurent Lake, and Long King Creek.

The Trinity River basin supports a broad diversity of fish species. Hubbs et al. (1991) list approximately 80 species of fish that occur in the Trinity River and its tributaries, and Thomas et al. (2007) list over 100 freshwater and estuarine species known to occur in the Trinity River Basin. Many estuarine and anadromous species make there way up to the tail waters of the Livingston Dam spillway. Table 3-9 lists common fish species known to occur in Lake Livingston and the Trinity River below Livingston Dam according to Thomas et al. (2007) and recent aquatic sampling records (PBS&J, 2008).

Lake Livingston was impounded in 1969. It has a surface area of 90,000 acres and a maximum depth of 77 ft. Native emergent plants are limited to the upper areas of the reservoir and in the backs of coves and embayments. The floating exotic water hyacinth (*Eichhornia crassipes*) is found throughout the reservoir. Very little cover exists in the lower reservoir due to vertical bulkhead (TPWD, 2007).

TABLE 3-9

FISH SPECIES OF THE TRINITY RIVER BASIN COMMON TO THE STUDY AREA[1]

Common Name[2]	Scientific Name[2]
PADDLEFISH	
Paddlefish	*Polyodon spathula*
GARS	
Alligator gar	*Atractosteus spatula*
Spotted gar	*Lepisosteus oculatus*
Longnose gar	*Lepisosteus osseus*
BOWFINS	
Bowfin	*Amia calva*
EELS	
American eel	*Anguilla rostrata*
SHADS	
Skipjack herring	*Alosa chrysochloris*
Gizzard shad	*Dorosoma cepedianum*
Threadfin shad	*Dorosoma petenense*
CARPS And MINNOWS	
Grass carp (I)	*Ctenopharyngodon idella*
Blacktail shiner	*Cyprinella venusta*
Common carp (I)	*Cyprinus carpio*
Redfin shiner	*Lythrurus umbratilis*
Silverband shiner	*Notropis shumardi*
Mimic shiner	*Notropis volucellus*

TABLE 3-9 (Concluded)

Common Name[2]	Scientific Name[2]
Bullhead minnow	*Pimephales vigilax*
SUCKERS	
Smallmouth buffalo	*Ictiobus bubalus*
Black buffalo	*Ictiobus niger*
CATFISHES	
Yellow bullhead	*Ameiurus natalis*
Blue catfish	*Ictalurus furcatus*
Channel catfish	*Ictalurus punctatus*
Flathead catfish	*Pylodictis olivaris*
MULLETS	
Striped mullet	*Mugil cephalus*
Mountain mullet	*Agonostomus monticola*
SILVERSIDES	
Inland silverside	*Menidia beryllina*
LIVEBEARERS	
Western mosquitofish	*Gambusia affinis*
TEMPERATE BASSES	
White bass	*Morone chrysops*
Yellow bass	*Morone mississippiensis*
Striped bass (I)	*Morone saxatilis*
BLACK BASSES AND SUNFISHES	
Warmouth	*Lepomis gulosus*
Orangespotted sunfish	*Lepomis humilis*
Bluegill	*Lepomis macrochirus*
Longear sunfish	*Lepomis megalotis*
Redspotted sunfish.	*Lepomis miniatus*
Spotted bass	*Micropterus punctulatus*
Largemouth bass	*Micropterus salmoides*
White crappie	*Pomoxis annularis*
Black crappie	*Pomoxis nigromaculatus*
DARTERS	
Bigscale logperch	*Percina macrolepida*
Dusky darter	*Percina sciera*
DRUMS	
Freshwater drum	*Aplodinotus grunniens*

[1]According to Thomas et al. (2007) and PBS&J (2008).

[2]Nomenclature and taxonomic order follows Hubbs et al. (1991) and Thomas et al. (2007).

(I) Introduced species

Although physical habitats in Lake Livingston are inadequate for cover-dependent species, the reservoir is highly productive with respect to phytoplankton communities (Menn, 1976; Bounds et al., 1982). The reservoir receives treated wastewater from the Dallas-Fort Worth metroplex. While significant

improvements in wastewater treatment have occurred since the reservoir was built, the Trinity River and Lake Livingston remain high in nutrients. The nutrients promote phytoplankton production, which serves as an important basis for the food web in the reservoir. Forage species, such as shad (*Dorosoma* spp.) and sunfish (*Lepomis* spp.) benefit from the plankton communities.

The TPWD frequently stocks fish in Lake Livingston (TPWD, 2007). Striped bass (*Morone saxitilis*) are stocked almost every year. Approximately 15 million striped bass were stocked from 1977 through 2007. Florida largemouth bass (*Micropterus salmoides floridanus*) are periodically stocked, with the latest stocking in 2006 and 2007, which totaled approximately 400,000 fish. Other historically stocked species included blue (*Ictalurus furcatus*) and channel catfish (*Ictalurus punctatus*) and paddlefish (*Polyodon spatula*). Management strategies for Lake Livingston include establishing native aquatic plants to improve habitat and stocking of advanced-size Florida largemouth bass and crappie (*Pomoxis* spp.). The stocking of advanced-size juvenile fish might help to increase recruitment of these species since nursery habitat is limiting (TPWD, 2000).

3.6.4 Recreationally and Commercially Important Fish Species

According to TPWD (2007), Lake Livingston is a notable white bass (*Morone chrysops*) fishery. White bass are plentiful and grow to large sizes. Also notable is the catfish fishery, dominated by blue catfish. Blue catfish are the largest freshwater sportfish in Texas, where 50 pounders are not unusual (Chilton, 1997). The lake record for blue catfish from Lake Livingston is 71 pounds taken in 1986 (TPWD, 2008a). Largemouth, striped bass, and crappie are less abundant in Lake Livingston proper, but good catches are possible in areas of the reservoir where habitat is available. Striped bass and white bass are the fourth- and fifth-most preferred species among licensed Texas Anglers (Chilton, 1997), and fishing for these species is very popular directly below the Livingston Dam, near the spillway on the Trinity River, especially during the spring spawn runs. Also becoming more popular is bow fishing for nongame fish species. The alligator gar is one of the more important fish species for bow anglers, and these species occur in considerable numbers and sizes in Lake Livingston and the Trinity River. The Lake record for the alligator gar was set in 2002. It was taken by a bow angler, was 67 inches in length, and weighed in at 102 pounds (TPWD, 2008a).

3.7 ENDANGERED AND THREATENED SPECIES

3.7.1 Endangered and Threatened Plant Species

Available information from the FWS, TPWD, and Texas Natural Diversity Database (TXNDD) was reviewed to identify endangered or threatened plant species of potential occurrence within the study area. No federally or state-listed species have been recorded from San Jacinto County, and only one has been recorded from Polk County: the Texas trailing phlox (*Phlox nivalis* ssp. *texensis*) (FWS, 2008; TPWD, 2008b). This plant is a short, evergreen, perennial subshrub that is endemic to deep sandy soils of fire-

maintained openings in upland longleaf pine savannas or post oak-bluejack oak woodlands in southeast Texas. Canopy closure due to fire suppression is a major threat to Texas trailing phlox, which depends on fire to maintain an open forest canopy (FWS, 1995a; Poole et al., 2007).

The species occurs in fewer than 20 populations in Hardin, Polk, and Tyler counties (TPWD, 2008c). The largest of these populations occurs on the Nature Conservancy's Roy E. Larsen Sandyland Sanctuary in Hardin County; other smaller populations occur on private lands and on adjacent highway ROW (FWS, 1995a). No previously recorded occurrences of the Texas trailing phlox have been documented in the study area or vicinity (TXNDD, 2008a, 2008b). Because of the absence of suitable habitat, it is unlikely that the species is present in the study area.

3.7.2 Endangered and Threatened Fish and Wildlife Species

FWS and TPWD county lists of endangered and threatened species indicate that 16 federally and/or state-listed endangered, threatened, and candidate fish and wildlife species/taxa may occur in Polk and San Jacinto counties (Table 3-10). It should be noted that inclusion in this table does not imply that a species is known to occur in the study area, but only acknowledges the potential for its occurrence. Only those species that FWS lists as endangered or threatened have federal protection under the Endangered Species Act (ESA).

The red-cockaded woodpecker (*Picoides borealis*) is federally/state-listed as endangered, while the piping plover (*Charadrius melodus*) and American black bear (*Ursus americanus*) are federally/state-listed as threatened. The red-cockaded woodpecker is a cooperative breeding woodpecker that inhabits open, old-growth pine forests of the southeastern U.S. The species historically ranged across the southeastern U.S., from southeast Virginia south to Florida, and west to southeastern Oklahoma and east Texas (Jackson, 1994; Connor et al., 2001). Current populations are highly fragmented and are concentrated primarily in extensive old-growth pine forests of federal and state lands within the woodpecker's historic range (Jackson, 1994; Connor et al., 2001). Preferred habitat is open, mature pine forest dominated by longleaf pine (*Pinus palustris*), shortleaf pine (*Pinus echinata*), loblolly pine (*Pinus taeda*), and, occasionally, slash pine (*Pinus. elliottii*). Old-growth (i.e., 60 to 70 years or more) pine trees, often with the centers rotted by red-heart fungus, are the usual nesting sites, but younger, uninfected pines are also used (Hooper et al., 1980; Jackson, 1994). Red-cockaded woodpeckers historically occurred in 34 east Texas counties; however, at the present-time the species is known to occur in no more than 18 Texas counties (Jackson, 1994; Connor et al., 2001). Currently, the largest Texas populations are within the Sam Houston, Angelina, Sabine, and Davy Crockett national forests, Jones and Fairchild state forests, and several private tracts (Connor et al., 2001). According to TXNDD (2008a), no previously recorded occurrences of the red-cockaded woodpecker exist within 2,000 ft of the study area. Because of the absence of suitable old-growth pine habitat, it is unlikely that the species would be present in the study area.

TABLE 3-10

ENDANGERED AND THREATENED SPECIES OF POSSIBLE OCCURRENCE IN POLK AND SAN JACINTO COUNTIES, TEXAS[1]

Common Name[2]	Scientific Name[2]	Status[3]	
		FWS	TPWD
PLANTS			
Texas trailing phlox	*Phlox nivalis* ssp. *texensis*	E	E
FISHES			
Creek chubsucker	*Erimyzon oblongus*	--	T
Paddlefish	*Polyodon spathula*	--	T
REPTILES			
Louisiana pinesnake	*Pituophis ruthveni*	C	T
Timber/canebrake rattlesnake	*Crotalus horridus*	--	T
Alligator snapping turtle	*Macrochelys temminckii*	--	T
BIRDS			
Red-cockaded woodpecker	*Picoides borealis*	E	E
Piping plover	*Charadrius melodus*	T	T
Bald eagle	*Haliaeetus leucocephalus*	--	T
Peregrine falcon (American subspecies)	*Falco peregrinus americanus*	--	E
Peregrine falcon (Arctic subspecies)	*Falco peregrinus tundrius*	--	T
Swallow-tailed kite	*Elanoides forficatus*	--	T
Wood stork	*Mycteria americana*	--	T
Bachman's sparrow	*Aimophila aestivalis*	--	T
MAMMALS			
Louisiana black bear	*Ursus americanus luteolus*	T	T
American black bear	*Ursus americanus*	T/SA[4]	T
Rafinesque's big-eared bat	*Corynorhinus rafinesquii*	--	T

[1] According to FWS (2008) and TPWD (2008b).

[2] Nomenclature follows Hubbs et al. (1991), AOU (1998, 2000, 2002, 2003, 2004, 2005, 2006, 2007), Crother et al. (2000, 2001, 2003), Baker et al. (2003), Jones and Wipff (2003), FWS (2008), and TPWD (2008b).

[3] FWS – U.S. Fish and Wildlife Service; TPWD – Texas Parks and Wildlife Department; E – Endangered; T – Threatened; T/SA – Threatened because of similarity in appearance to another federally listed species; C – Candidate for federal listing; -- – Not listed.

[4] FWS identifies the American black bear as a threatened species because of its similarity in appearance to the federally listed threatened Louisiana black bear (*Ursus americanus luteolus*); however, the American black bear is federally threatened only within the historical range of the Louisiana black bear in eastern Texas and is not federally threatened elsewhere in Texas.

The piping plover is a small shorebird that inhabits coastal beaches and tidal flats. Approximately 35% of the known global population of piping plovers winters along the Texas Gulf Coast, where they spend 60 to 70% of the year (Campbell, 1995; Haig and Elliott-Smith, 2004). The piping plover population that winters in Texas breeds on the northern Great Plains and around the Great Lakes. General habitat includes shorelines or oceans, rivers, and inland lakes. Within their wintering range, which includes the Texas Gulf Coast, piping plovers inhabit beaches and bay margins, particularly tidal mudflats and sandflats, algal flats, sandy beaches, and spoil islands (AOU, 1998; Haig and Elliot-Smith, 2004). The piping plover is a very rare migrant in east Texas; however, inland records of migrating piping plovers are scarce (Wolf et al., 2001; Lockwood and Freeman, 2004). According to TXNDD (2008a), no previously recorded occurrences of this species exist within 5 miles of the study area. It is unlikely that the piping plover would occur in the study area.

The Louisiana black bear historically inhabited east Texas, Louisiana, and southern Mississippi, but is now confined to small numbers in Mississippi along the Mississippi River, and to core populations in the Tensas and Atchafalaya River basins in Louisiana (57 FR 588–595; FWS, 1995b). The last Texas Pineywoods record of the native black bear is from the late 1950s, near the town of Livingston in Polk County (Fleming, 1980). Periodic reports of black bears exist from various counties of east Texas; however, these bears most likely represent individuals dispersing from neighboring areas in Louisiana (Taylor, 2000). Louisiana black bears require large areas of remote, undisturbed bottomland hardwood forest habitat, although other forest types may be used (FWS, 1995b). Of particular importance is high quality cover for bedding, denning, and escape, particularly where areas of suitable habitat have become smaller and more fragmented (FWS, 1995b). No previously recorded occurrences of the Louisiana black bear have been documented in the study area or vicinity (TXNDD, 2008a, 2008b). Black bears are extremely rare in east Texas and it is unlikely that they would be present in the study area.

Formerly widespread throughout the state, the American black bear is now restricted to mountainous areas of the Trans-Pecos region and the far southwestern edge of the Edwards Plateau (Taylor, 2000; Schmidly, 2004). The FWS designates the American black bear as threatened because of its similarity in appearance to the Louisiana black bear, but this status applies only within the historic range of the Louisiana black bear. Because of the similarity of appearance between the two taxa, FWS treats all east Texas black bears as threatened. No previously recorded occurrences of the black bear have been documented in the study area or vicinity (TXNDD, 2008a, 2008b). As noted above, black bears are extremely rare in east Texas and it is unlikely that they would be present in the study area.

FWS identifies the Louisiana pinesnake as a candidate species for federal listing as endangered or threatened. The species historically occurred in portions of west-central Louisiana and east Texas, an area that represents the westernmost occurrence of the longleaf pine ecosystem (FWS, 2007). The Louisiana pinesnake inhabits pine savannah with sandy, well-drained soils. Of particular importance is the presence of substantial herbaceous ground cover, which provides habitat for the Baird's pocket gopher (*Geomys*

breviceps), the Louisiana pinesnake's primary prey (FWS, 2007). Dixon (2000) indicates documented records of this snake from Polk County, as well as several surrounding counties; however, recent documented east Texas records are restricted to Angelina, Jasper, Newton, Sabine, and Tyler counties (FWS, 2007). No previously recorded occurrences of the Louisiana pinesnake have been documented in the study area or vicinity. Because of the absence of suitable habitat, it is unlikely that the species would be present in the study area.

The remaining 11 fish and wildlife taxa in Table 3-10, while not federally listed or federal candidates for listing, are state-listed. The American peregrine falcon (*Falco peregrinus americanus*) is listed as endangered, while the following are listed as threatened: two fish, the creek chubsucker (*Erimyzon oblongus*) and paddlefish (*Polyodon spathula*); two reptiles, the timber/canebrake rattlesnake (*Crotalus horridus*) and alligator snapping turtle (*Macrochelys temminckii*); five birds, the bald eagle (*Haliaeetus leucocephalus*), Arctic peregrine falcon (*Falco peregrinus tundrius*), swallow-tailed kite (*Elanoides forficatus*), wood stork (*Mycteria americana*), and Bachman's sparrow (*Aimophila aestivalis*); and one mammal, Rafinesque's big-eared bat (*Corynorhinus rafinesquii*).

Both the American peregrine falcon and Arctic peregrine falcon are statewide migrants in Texas (Lockwood and Freeman, 2004). The coast provides important migratory habitat for both subspecies. Arctic peregrines are known to overwinter on the Texas coast (Morizot and Maechtle, 1987). No nesting records of peregrines exist for the study area counties (Oberholser, 1974) and no occurrence records exist for the study area or immediate vicinity (TXNDD, 2008a, 2008b). These falcons are unlikely to occur in the study area except passing through during migration.

The recently delisted bald eagle is a rare and local summer resident in the eastern third of Texas, where it breeds along the Gulf Coast and on major inland lakes and reservoirs (Buehler, 2000; Lockwood and Freeman, 2004). During migration and winter, the species is more widely distributed, occurring primarily in the northern two-thirds of the state (Buehler, 2000; Lockwood and Freeman, 2004). Bald eagles prefer large bodies of water surrounded by tall trees or cliffs, which they use as nesting and roosting sites. On July 9, 2007, the FWS published its final ruling to remove the bald eagle from the list of endangered and threatened wildlife (72 FR 37345–37372) and the change of listing status became official on August 8, 2007. The bald eagle will still receive protection at the state level and under provisions of the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA). Ortego (2002) documented active nests in Polk and San Jacinto counties and TXNDD (2008a, 2008b) indicated a territory on Lake Livingston. PBS&J encountered a bald eagle nest near the Trinity River south of the dam and south of FM 3278 during a field visit in March 2008. Adult eagles were also seen foraging along the Trinity River south of FM 3278. According to locals, the nest produced young.

The swallow-tailed kite is a casual to rare migrant in all parts of the state except the Panhandle and western half of the Edwards Plateau (Lockwood and Freeman, 2004). Habitat includes freshwater and brackish marshes, bottomland forests, and swamps (Oberholser, 1974; Meyer, 1995). Historically, it was

a very common to uncommon breeding species in the eastern half of Texas, but was almost completely extirpated from the state by 1910 (Oberholser, 1974). The species was not known to nest in the state from 1914 to 1993 (Boone, 1991, 1992, 1993). In 1994, a swallow-tailed kite nest was observed near the Neches River in Tyler County, Texas (Brown et al., 1997). Swallow-tailed kites have been observed exhibiting breeding behavior during the breeding season since 1990, and a recent survey (Shackelford and Simons, 2000) confirmed nest sites in Orange County, Texas. The swallow-tailed kite was observed in numerous Texas counties between Clay County along the Red River and Hidalgo County along the Rio Grande, and has been observed in most of the gulf coast counties. Within Texas, this species most often occurs in Chambers, southern Harris, Liberty, Hardin, Jefferson, Orange, eastern Tyler, Jasper, and Newton counties (Shackelford and Simons, 2000). Although it has not been reported from either Polk County or San Jacinto County, this species could occur in the study area as a rare migrant.

The wood stork is an uncommon to locally common postbreeding visitor to the Texas coast and inland to the eastern third of the state (Lockwood and Freeman, 2004). Suitable habitat for this species occurs in the study area. Thus, wood storks may visit the study area during migration/postbreeding dispersal.

Bachman's sparrow, an inhabitant of open pine or oak woods, brushy, overgrown fields, and scrub palmetto thickets (Rappole and Blacklock, 1994; Dickinson, 2002), is an uncommon local resident of the Pineywoods region (Lockwood and Freeman, 2004). This species has been recorded from both Polk County and San Jacinto County; it is of potential occurrence in the study area.

The creek chubsucker inhabits tributaries of the Red, Sabine, Neches, Trinity, and San Jacinto rivers, and small rivers and creeks of various types. Although the creek chubsucker occupies a variety of habitats, it seldom occurs in impoundments or springs, preferring headwaters. It spawns in river mouths or pools, riffles, lake outlets, and upstream creeks. The young are typically found in headwater rivulets or marshes. The creek chubsucker is a possible resident of streams in the study area.

The native range of the paddlefish is limited to rivers in east Texas and, prior to the 1990s, most of the species was believed extirpated from most of its range in Texas due to construction of dams on the rivers (TPWD, 1999). A program to reintroduce paddlefish to selected river segments through stocking was conducted in the 1990s by the TPWD. Results of the restoration efforts are provided in TPWD (1999). The Trinity River upstream of Lake Livingston was one of the river reaches that was identified as possible paddlefish spawning habitat. Paddlefish were stocked in Lake Livingston from 1990 through 1992, where approximately 110,000 juvenile paddlefish were released. A tracking study using radio telemetry was performed on the Neches River to identify habitat use and movement of young paddlefish (Pitman and Parks, 1994). Results of the study indicated that paddlefish moved downstream through a reservoir floodgate on the Neches River. Although not specifically studied by TPWD, paddlefish were found in the Trinity River downstream of Lake Livingston dam, which indicated that some of the stocked fish moved through the dam. Paddlefish were also caught in the Trinity River below the dam by PBS&J

biologists during recent sampling efforts (PBS&J, 2008). While paddlefish are presently found in the Trinity River, spawning of this fish has not been documented.

The timber/canebrake rattlesnake typically inhabits dense thickets and brushy areas along the floodplains of major creeks and rivers throughout the eastern third of Texas. It can be found in a variety of habitats including floodplains and riparian areas, swamps, upland pine and deciduous woodlands, abandoned farmland, and limestone bluffs (Werler and Dixon, 2000). This rattlesnake is most active during the summer and fall, with some activity noted in spring and as late as December (Werler and Dixon, 2000). It has been recorded from both Polk County and San Jacinto County (Dixon, 2000), and is of potential occurrence in the study area.

The alligator snapping turtle is an inhabitant of deep rivers, lakes, and large streams with muddy bottoms (Bartlett and Bartlett, 1999). It has been recorded from Polk County (Dixon, 2000) and is of potential occurrence in the study area.

Rafinesque's big-eared bat occurs throughout the southeastern U.S., with east Texas being at the western limit of its range. Rafinesque's big-eared bat roosts in tree cavities, crevices under bark, under dry leaves, in buildings, and in abandoned wells (Schmidly, 2004). This bat has been recorded from Polk county (Schmidly, 2004), but not from the study area (TXNDD, 2008a, 2008b). It is of potential occurrence in the study area.

The red wolf (*Canis rufus*) is both federally and state listed as endangered. It formerly occurred in the eastern half of Texas, where it inhabited a variety of wooded habitats including pine forests, bottomland hardwood forests, swamps, marshes, and coastal prairies (Schmidly, 2004). The decline of the species was a result of intensive land use (e.g., agriculture and lumbering) and hybridization with the coyote (*Canis latrans*) (Schmidly, 2004). Most authorities consider the red wolf extirpated in Texas. Thus, it has been excluded from Table 3-10 and will not be discussed further.

Critical Habitat

The FWS, in Section 3(5)(A) of the ESA, defines critical habitat as (i) the specific areas within the geographical area occupied by the species, at the time that it is listed in accordance with the ESA, on which are found those physical or biological features that are (I) essential to the conservation of the species and (II) that may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. No critical habitat occurs in the study area.

3.8 SOCIOECONOMICS

This section presents a summary of economic and demographic characteristics for Polk and San Jacinto counties, and provides a brief description of the socioeconomic environment of the region. Literature

sources reviewed include publications by the U.S. Census Bureau, the U.S. Bureau of Labor Statistics (BLS), the TWDB, and the Texas Workforce Commission (TWC).

3.8.1 Population Trends

As shown on Figure 3-4, the populations of Polk and San Jacinto counties have experienced steady growth throughout the past two decades, and these populations are expected to continue to increase through the next three decades. Between 1980 and 1990, Polk County's population increased by 25.7%, while San Jacinto County's population increased by 43.2%. The state's population also increased by 19.4% during the same period. Populations continued to increase for Polk County, San Jacinto County, and the state during the 1990s, with population increases of 34%, 35.9%, and 22.8%, respectively. The most current (2006) U.S. Census Bureau estimates show a population of 46,995 for Polk County and 24,760 for San Jacinto County, which represent increases of 14.3% and 11.3%, respectively, over 2000 figures (U.S. Census Bureau, 2008). For 2006, the U.S. Census Bureau shows 23,507,783 for the state, which is a 12.7%, increase from 2000 (U.S. Census Bureau, 1990a, 1990b, 2000, 2008).

Projections from the TWDB indicate that growth will continue for both counties and the state through the next three decades. Polk County's population is expected to increase 16.9 % between 2000 and 2010, by 14.2% between 2010 and 2020, and by 10% between 2020 and 2030. Meanwhile, San Jacinto County's population is expected to increase by 23.4% between 2000 and 2010, by 18.6% between 2010 and 2020, and by 12.5% from 2020 and 2030. By comparison, the state's population is expected to increase by 19.5% between 2000 and 2010, 16.9% between 2010 and 2020, and 13.5% between 2020 and 2030 (TWDB, 2006).

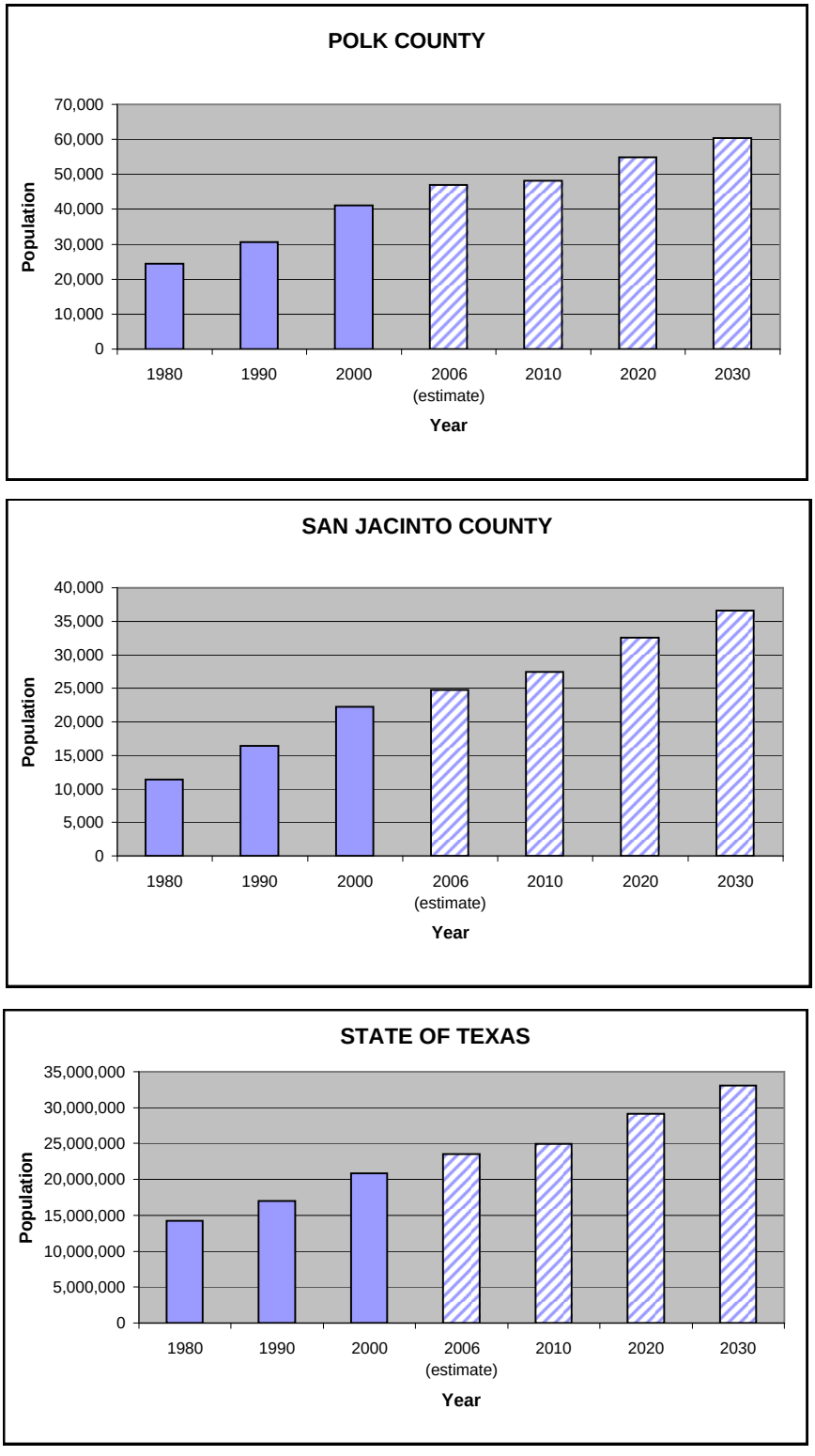
3.8.2 Employment

As shown on Figure 3-5, the civilian labor force (CLF) in Polk and San Jacinto counties increased with the corresponding growth of the counties' populations. Between 1990 and 1995, the CLF in Polk County increased from 11,631 to 14,610 (25.6%), and San Jacinto County's CLF increased from 6,057 to 7,575 (25.1%). Between 1995 and 2000, Polk County's CLF grew to 15,865, an increase of 8.6%, and in San Jacinto County the CLF reached 9,377, an increase of 23.8%. In 2005, the CLF in Polk County reached 16,972, an increase of 7%, while San Jacinto County's CLF reached 10,305, an increase of 9.9%. The most recent (December 2007) labor force data show that Polk County's labor force increased by 0.4% to reach 17,042, while San Jacinto County experienced an increase of 4.7% to reach 10,791. By comparison, the state's CLF increased from 8,593,724 in 1990 to 9,572,436 in 1995, an increase of 11.4%. Between 1995 and 2000, the statewide CLF continued to increase to 10,347,847 (8.1%), and between 2000 and 2005, the CLF increased by 8.2% to reach 11,196,284. The most recent (December 2007) labor force data for the State of Texas show the CLF at 11,575,095, an increase of 3.4% over the 2005 CLF (BLS, 2008).

Since 1990, unemployment rates for all three counties have experienced change. In 1990, Polk County had an unemployment rate of 6.2%, while in San Jacinto County the unemployment rate was 4.3%.

FIGURE 3-4

POPULATION TRENDS AND PROJECTIONS
FOR POLK AND SAN JACINTO COUNTIES AND THE STATE OF TEXAS



Source: U.S. Census Bureau (1990a, 1990b, 2000, 2008), TWDB (2006).

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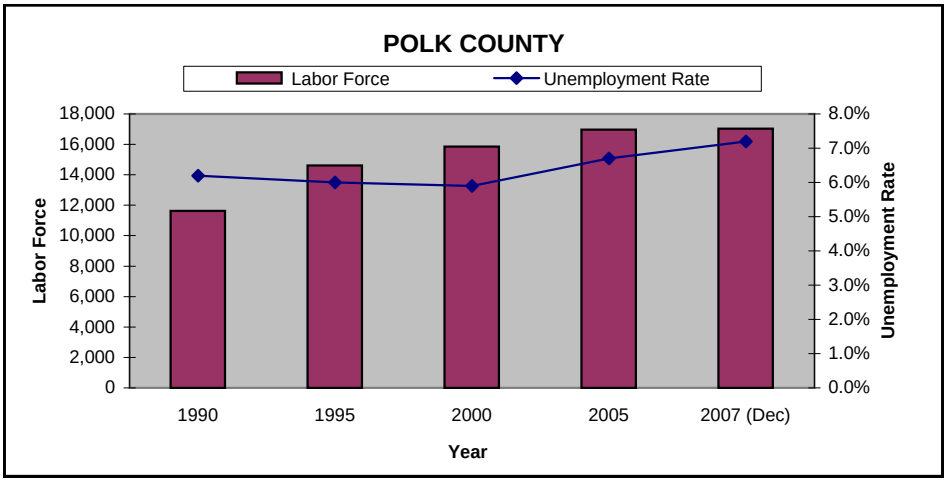
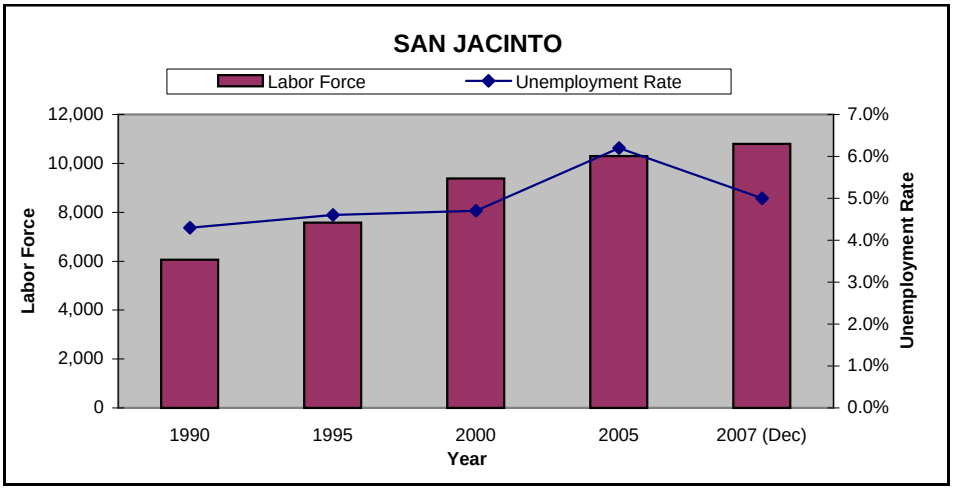
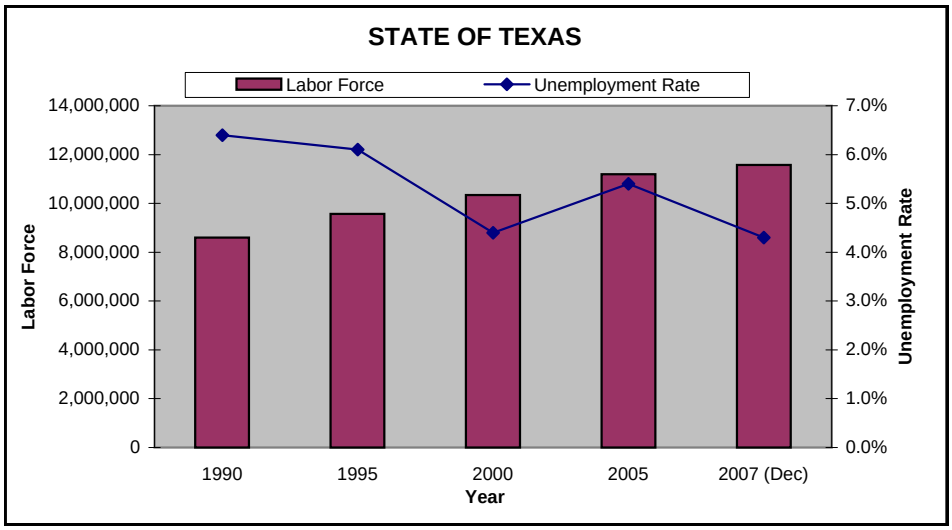
FIGURE 3-5

CIVILIAN LABOR FORCE AND UNEMPLOYMENT RATES FOR POLK AND SAN JACINTO COUNTIES AND THE STATE OF TEXAS







Source: BLS (2008).

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Statewide the unemployment rate was 6.4% in the same year. In 1995, Polk County and the state experienced a slight decrease in unemployment, falling to 6% and 6.1%, respectively. However, San Jacinto County experienced an increase, to 4.6% for the same year. Both Polk County and Texas experienced another decrease in unemployment in 2000, falling to 5.9% and 4.4%, respectively. San Jacinto County, however, experienced a slight increase, to 4.7%. In 2005, both counties and Texas all experienced an increase in unemployment, with Polk County's rate rising to 6.7%, San Jacinto County's to 6.2%, and the state's to 5.4%. The most current data (December 2007) for unemployment show Polk County's increased to 7.2%, while both San Jacinto County's at 5.0%, and the state's at 4.3% decreased since 2005 (BLS, 2008).

3.8.3 Leading Economic Sectors

Covered employment data tallies jobs that are located in the county and it includes workers covered by state unemployment insurance and most agricultural employees. The data include all corporation officials, executives, supervisory personnel, clerical workers, wage earners, pieceworkers, and part-time workers. The data exclude employment covered by the Railroad Retirement Act, self-employed persons, and unpaid family workers. A study of the third quarter covered-employment data for 2002 and 2007 shows that covered employment in Polk County decreased from 6,512 to 5,781 (11.2%), San Jacinto County increased slightly from 2,035 to 2,131 (4.7%), and the State of Texas increased from 9,250,263 to 10,257,567 (10.9%) during the same period (TWC, 2008).

As shown on Figure 3-6, third quarter TWC employment figures for 2007 indicate that the leading economic sectors in Polk County were trade, transportation, and utilities (38%), federal, state, and local government (36%), and financial activities (7%). In San Jacinto County, the leading sectors were federal, state, and local government (47%), trade, transportation, and utilities (18%), and leisure and hospitality (9%). By comparison, the leading economic sectors for Texas for the third quarter of 2007 were trade, transportation, and utilities (21%), federal, state, and local government (16%), and professional and business services (13%) (TWC, 2008).

3.8.4 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. This term has not been specifically defined for regulatory purposes by the PUC. However, on the CCN application for transmission lines, the PUC requests information concerning the following items under the general heading Community Values:

- Approvals or permits required from other governmental agencies;
- General description of the area traversed by the line;
- Residences, business, schools, churches, cemeteries, hospitals, nursing homes, or other habitable structures within 300 ft of the centerline of the proposed project;

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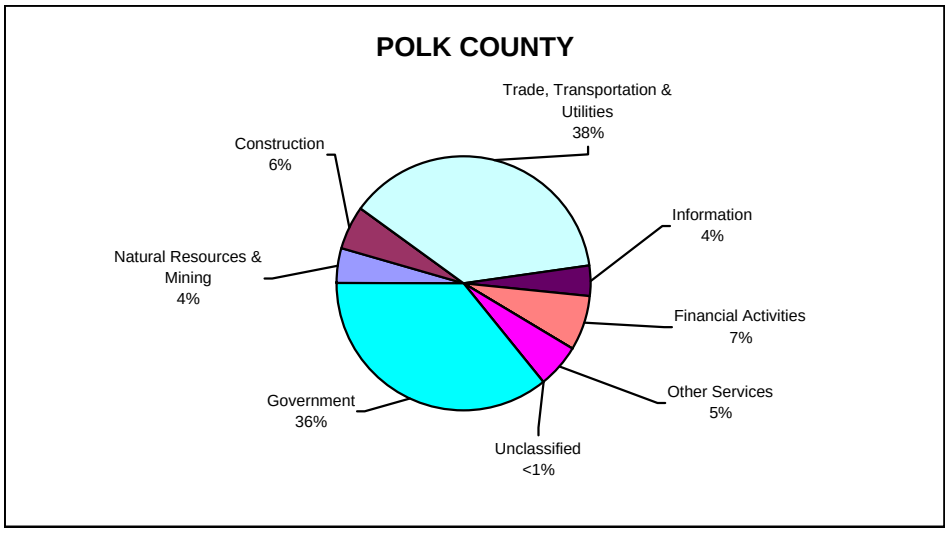
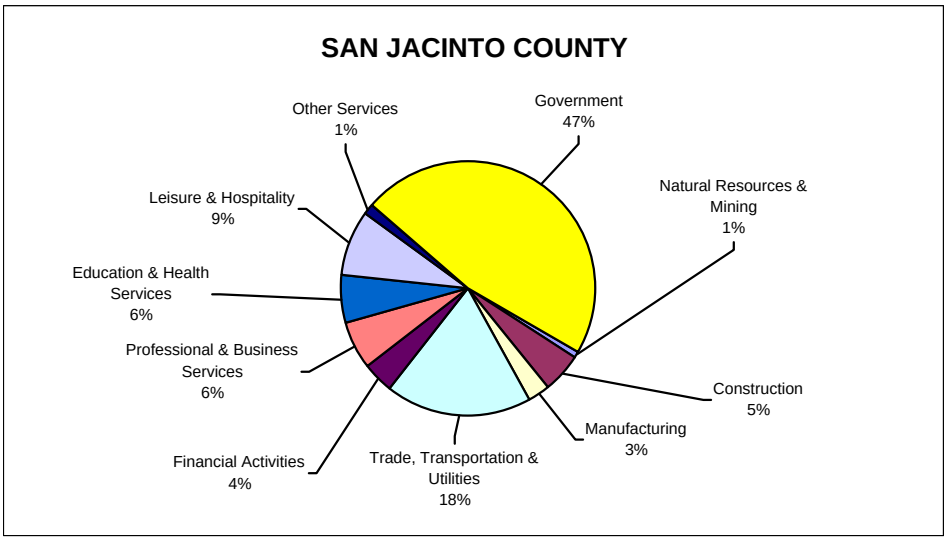
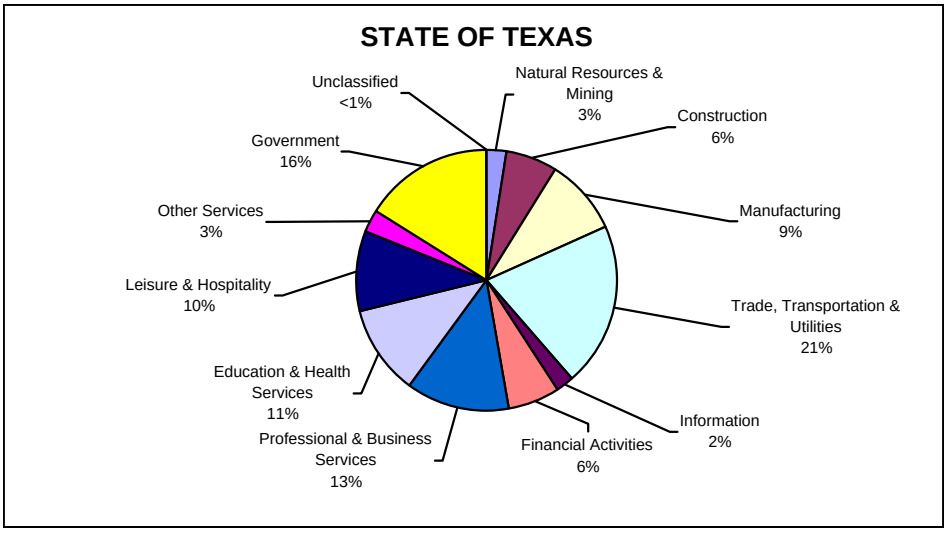
FIGURE 3-6

LEADING ECONOMIC SECTORS
FOR POLK AND SAN JACINTO COUNTIES AND THE STATE OF TEXAS
3rd QUARTER 2007







Source: TWC (2008).

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- FAA-registered airstrips located within 10,000 ft of the proposed centerline;
- Radio/TV towers, microwave relay stations, and other electronic installations in the vicinity of the proposed route; and
- Irrigated pasture or cropland utilizing center-pivot or other traveling irrigation systems.

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

3.9 HUMAN DEVELOPMENT

3.9.1 Land Use

As noted previously, the study area is located southeast of Lake Livingston and includes portions of Polk and San Jacinto counties. It is mostly rural with agricultural fields and some residential development; no cities occur within the study area. The study area is located in State Planning Region No. 14, which is represented by the Deep East Texas Council of Governments, with headquarters in Jasper and Lufkin.

According to NRCS land use estimates (NRCS, 2000), the three primary land use categories in Polk County were forestland (72%), pastureland (14%), and large waterbodies (streams greater than or equal to 660 ft in width or waterbodies greater than 40 acres) (5%). For San Jacinto County, the top three land use categories were forestland (58%), federal land cover (15%), and pastureland (11%).

3.9.2 Parks and Recreation

A review of the Texas Outdoor Recreation Plan (TORP) (TPWD, 1984), the Texas Outdoor Recreation Inventory (TORI) (TPWD, 1990), federal, state, and local maps, and field surveys, identified one park within the study area. Southland Park, which is owned and operated by Polk County, is located in the northwest portion of the study area, on Recreational Road 5 off of FM 1988. The park offers a boat ramp, picnic and camping facilities, and bike trails. This park, however, has been closed to the public and no longer serves as a park.

The Trinity River is classified as permanently floatable between the Anderson-Houston county line and the Polk-Liberty county line, which includes the portion of the river within the study area. The river is therefore considered to have a width and average streamflow discharge that allows for recreational opportunities, such as canoeing, kayaking, and rafting on a relatively constant basis (TPWD, 1984).

3.9.3 Agriculture

Agriculture, both crop cultivation and ranching, still constitutes an important segment of the study area economy. According to estimates recently published by the U.S. Department of Agriculture (USDA)

National Agricultural Statistics Service (NASS), the total land in farms decreased by 8% in both Polk and San Jacinto counties between 1997 and 2002 (NASS, 2002).

The 2002 market value of production within Polk County was estimated at $5,779,000, with crop sales accounting for 21% of this total and livestock sales accounting for 79%. Top livestock inventory items for Polk County include cattle and calves, colonies of bees, and horses and ponies, while top crop items include forage, short-rotation woody crops, and corn (NASS, 2002).

For San Jacinto County, the 2002 market value of production was estimated at $5,518,000. Crop sales accounted for 26% of this total, while livestock sales accounted for 74%. Top crop inventory items include cattle and calves, horses and ponies, and goats, while top crop inventory items include forage, short-rotation woody crops, and pecans.

3.9.4 Transportation/Aviation Facilities

The major transportation feature within the study area is FM 1988, which connects the northwest corner and the southeast corner of the study area, and FM 3278 (and bridge), situated in the western portion of the study area that connects FM 1988 to areas west of the Trinity River. The remainder of the transportation grid within the study area is composed of county roads and rural residential streets.

A review of the Airport/Facility Directory for the South Central U.S. (Federal Aviation Administration [FAA], 2008a), and the Houston Sectional Aeronautical Chart (FAA, 2008b) revealed no public, private, or military airports or heliports within the study area.

3.10 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 impact 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 environmental 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 (forest, 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 generally medium to high level of aesthetic quality. Water is quite prominent in the landscape, from the Trinity River in the western portion of the study area, to the several lakes and smaller waterbodies. The study area has not been extensively developed, and most development is agricultural. Woodland also occurs within the study 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 are marked by special signs along designated highways (TxDOT, n.d.). A review of these pamphlets revealed that none of the trails passes through the study area.

3.11 CULTURAL RESOURCES

Polk and San Jacinto counties are situated within the Southeast Texas Archeological Region (Perttula, 1993), as indicated on Figure 3-7 (Mercado-Allinger et al., 1996). By the close of the Pleistocene, hunter-gatherers, referred to as Paleoindians, roamed over much of North America. During the Archaic period, population density and economic diversification are thought to have increased while a mobile hunting and gathering subsistence strategy was maintained. During the Early Ceramic period, sandy paste ceramics were introduced, although this does not necessarily indicate changes in subsistence in all areas. Agriculture and increased sedentism are thought to have begun during the Late Prehistoric period.

3.11.1 Cultural Overview

3.11.1.1 Prehistoric

The Paleoindian period is the earliest generally accepted cultural period in the New World and includes populations that inhabited most, if not all, of North America by the end of the Pleistocene epoch. It has been hypothesized that in Texas the Pleistocene coastline extended as much as 25 miles into the present Gulf of Mexico, and that rivers cut deep canyons into sediments deposited during previous periods of glaciation (Aten, 1983). With the close of the Pleistocene came a period of climatic warming and a subsequent rise in sea level as surface water was released from glaciers and polar ice. Paleoindian cultural developments in the Gulf Coastal Plain region, as in most areas of North America, appear to have been

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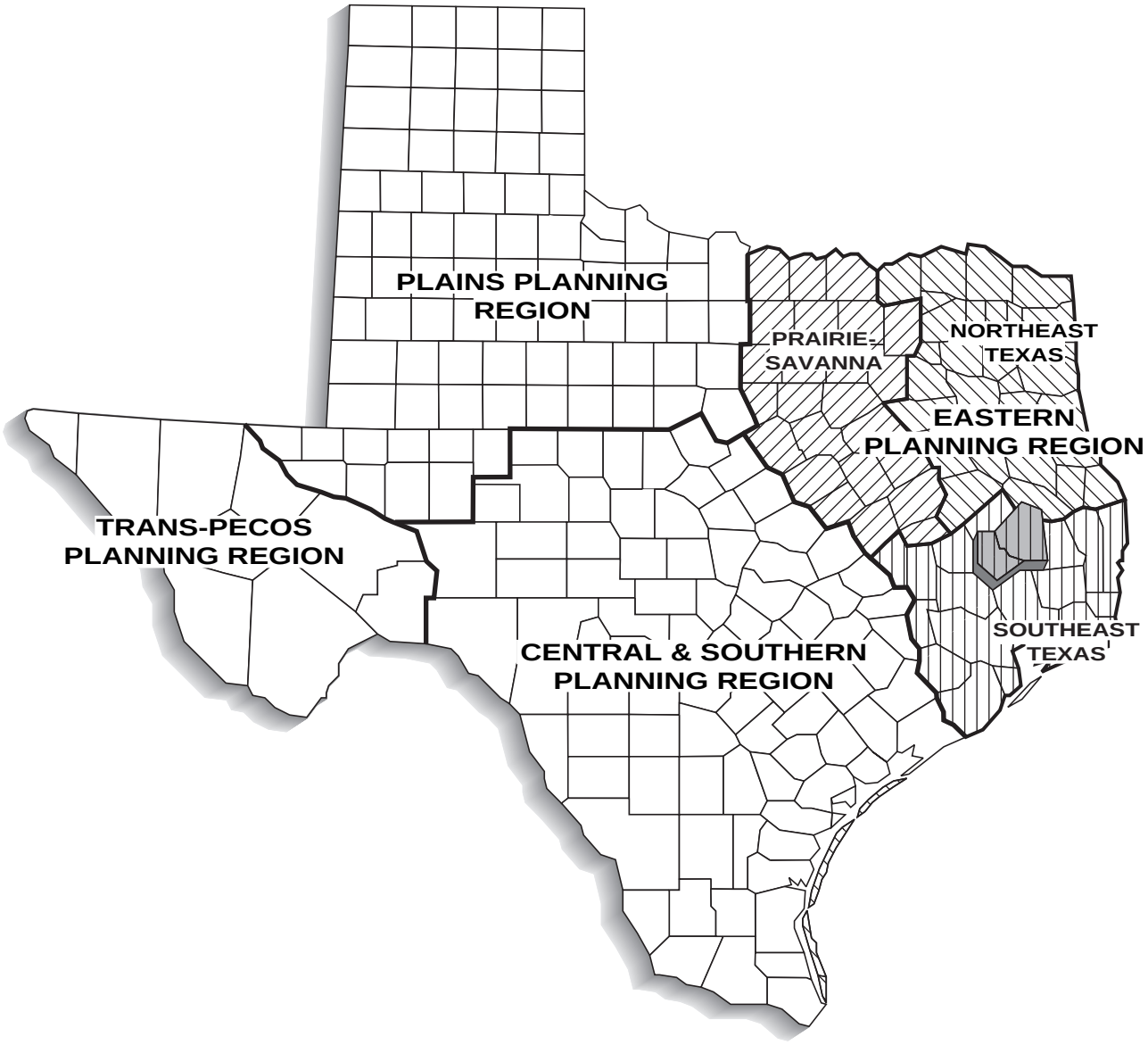

north

100 0 100 200

scale in miles

Source: Mercado-Allinger et al. (1996)

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Figure 3-7

LOCATION OF POLK AND SAN JACINTO COUNTIES IN RELATION TO THE CULTURAL RESOURCES PLANNING REGIONS OF TEXAS

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intimately related to these gradual but vast changes in the world climate and local environmental conditions.

Paleoindian occupation of the region during the terminal Pleistocene is evidenced by the recovery of several types of well-made, lanceolate, parallel-flaked projectile points from archeological contexts in Tyler, San Augustine, and Angelina counties. Evidence of this culture has also been found in the Addicks Reservoir basin in Harris County (Wheat, 1953; Patterson, 1979) and at several sites within and near the Galveston Bay vicinity. Projectile point types such as Scottsbluff, Clovis, Plainview, Angostura, and possibly San Patrice are considered characteristic of the Paleoindian culture. Archeological evidence synthesized by Story et al. (1990) from numerous counties comprising the Greater Gulf Coastal Plain in Texas, Louisiana, Arkansas, and Oklahoma support the suggestion that the early cultures of the Paleoindian period probably existed in small nuclear families or bands that migrated widely in pursuit of seasonal resources.

Cultural developments appear to have progressed beyond those of the Paleoindian period with the onset of the Holocene epoch, when changes in the world climate caused sea levels to rise, inland prairies to expand, and regional weather patterns to become more variable (Aten, 1983). Generally termed the Archaic, this next period of cultural development has been further subdivided into Early, Middle, and Late stages based on changes observed in the archeological record that appear to coincide with episodic shifts in the Holocene climate and environment. While the Archaic period may generally be characterized as a period of increasing population, as well as a period of increased cultural and economic diversification, it is also thought to have retained lifestyles and subsistence strategies developed during the previous Paleoindian period.

Despite a paucity of intact Early and Middle Archaic components at sites in southeast Texas, Archaic lithic technologies appear to show an increased diversity of functional types and styles over those associated with the Paleoindian period, while the level of craftsmanship and the use of fine exotic materials appear to have declined. In addition, the greater array of Archaic projectile point styles appears to reflect a greater degree of regional specificity (Story et al., 1990). From these apparent changes in the lithic technologies of Archaic cultures, these authors surmise that Archaic period human populations may have become more dense with individual bands covering less overall territory on their seasonal rounds.

In east and southeast Texas, the projectile point that most frequently typifies the Early Archaic assemblage is the San Patrice (Shafer, 1974; Shafer and Stearns, 1975), which characteristically exhibits triangular or leaf-shaped blades, is nearly always thinned at the base, and somewhat resembles the Dalton type (Goodyear, 1974) and Meserve type (Suhm and Jelks, 1962).

Much of the information regarding the Middle Archaic is derived from investigations at Lake Conroe (Shafer, 1968), Lake Livingston (McClurken, 1968), Lake Limestone (Prewitt and Mallouf, 1977), and

the Allens Creek Project area (Hall, 1981). Overall, this period is characterized by expanding and parallel-stemmed dart points such as Evans, Edgewood, Ellis, Lone Oak, Palmillas, Trinity, and Yarbrough.

Sites dating to the Late Archaic period tend to be more abundant and are usually located on sandy knolls and other high terraces along perennial streams (Shafer et al., 1975). Many have been found within the confines of the various reservoir projects of east and southeast Texas (Shafer, 1966; McClurken, 1968; Prewitt and Mallouf, 1977; Hall, 1981) and as a consequence have been subjected to a considerable amount of excavation and analysis. Typically, Late Archaic sites tend to be relatively small and only rarely contain specialized tools or specific indicators of subsistence technology.

The advent of the Early Ceramic period actually heralds few changes. Shafer et al. (1975) argue that patterns developed during the Archaic effectively remain in place with the only alteration being the addition of ceramics to the technological repertoire. Sites are numerous and are usually located on sandy knolls or ridges and along the edges of stream valleys. Assumed utilized floral and faunal resources that have been identified at archeological sites in this region include hickory, walnut, pignut, deer, raccoon, tortoise, bison, and fish. No evidence has been found of long-term or permanent settlements that might support horticulture. Initially, the lithic assemblage of the Early Ceramic was dominated by contracting-stem projectile points, such as Gary, with rectangular-stemmed types, such as Kent, continuing.

Ceramic sequences derived from the Sabine Lake and Trinity delta areas indicate that the ceramics were principally an indigenous development, although they may be technologically related to the Tchefuncte. Most of the early vessels of southeast Texas are sandy paste hemispherical bowls and cylindrical jars with round and sometimes flat bases. Decorations are usually rare and, when they occur, are typically in the form of incised lines, punctations, and lip notching (Shafer, 1974). Despite a halting start, area residents achieved a firmer grasp of ceramic technology by the middle of the Early Ceramic period.

The Early Ceramic cultural development in southeastern Texas shows similarities with developments related to Woodland Culture manifestations of the southeastern U.S. Shafer (1974) states that sandy paste ceramics and the Gary point lithic tradition represent a local Woodland manifestation that was involved in Hopewell interaction and continued after its demise until the historic period, when it was represented by the indigenous Bidai, Deadose, Patiri, and Akokia.

The Late Prehistoric period in portions of the upper Texas coast spans the time between approximately A.D. 800 or 900 and A.D. 1700. The period is marked technologically by the appearance of arrow points, notably of the types Scallorn and Perdiz. With the exception of the use of the bow-and-arrow, little evidence exists for cultural change. No population increase appears to have occurred, as evidenced by the higher artifact density and more numerous hearth features associated with Late Prehistoric-age deposits.

In the southeast Texas woodlands, the Late Prehistoric introduction of the bow-and-arrow did not herald a change in subsistence, but the presence of Caddoan ceramics indicates trade with sedentary farmers of northeast Texas, if not a horticultural economy in some local drainages. In particular, the upper West Fork

of the San Jacinto River (Lake Conroe) and middle Trinity River (Lake Livingston) appear to have been inhabited by the Deadose and Bidais. Both tribes were found to maintain gardens of domesticated plants near seasonal village settings at contact (Story et al., 1990). It would not be surprising, therefore, that the East Fork of the San Jacinto River drainage and the study area were also inhabited by similar peoples.

3.11.1.2 Historic

The first Europeans to encounter native groups in east Texas were Cabeza de Vaca in 1528 and the survivors of the De Soto expedition in 1542. According to Newcomb (1961), the main indigenous Indian groups in southeast Texas at the time were the Bidais, Deadose, Patiri, and Akokisa. These groups were closely related and spoke the Atakapan language. By the end of the nineteenth century these indigenous groups were gone from the scene. A small immigrant Native American population composed of Alabama and Koasati (Coushatta) managed to maintain a presence in east Texas. Today they represent one of only a few resident native groups in the state.

The pineywoods of east Texas were obviously capable of supporting resident indigenous populations. To a large extent, however, the arriving Euro-Americans had a more difficult time. The rolling, forested landscape was not particularly suited to large-scale agriculture. Some members of Stephen F. Austin's First Colony settled along the San Jacinto River in 1824, and cattle ranching and timbering became the principal economic mainstays. Later, oil and gas exploration, beginning near Beaumont in the early part of this century, significantly altered the economic picture of the area, but not necessarily its settlement pattern. The population of the region followed a traditional dispersed single-family rural homesite and small-hamlet pattern with an overlay of oil and gas related industrial activities.

Polk and San Jacinto Counties

The region of present day Polk and San Jacinto counties was included in a vast royal land grant to Panfilo de Narvaez, although the area was largely ignored by the Spanish. As early as 1529, a few roads following Indian trails were completed through the district, but no settlers came. Between 1831 and 1834, about 100 American and Hispanic families received land grants, but few actually settled the land. Based on the 1834 census records, only seven families lived in the Trinity River settlement of Smithfield.

Present day Polk County became officially organized in August 1846 with Livingston as the county seat. The first permanent settlers in the county were the Alabama-Coushatta who continue to live in the Big Thicket area. During the early 1830s, European settlers began moving into the area. While many of them settled near the Trinity River, many more settled near major creeks. Cotton was the biggest industry leading up to the Civil War and then declined along with corn crops through the 1850s and 1860s. While much of the county is forested, about 40% was considered prime farmland. Because of this, plantations dominated the economy prior to the Civil War.

The population of the county grew slowly in the late nineteenth century as did industries such as cotton and corn production. In addition, cattle and other livestock made up a larger part of the economy. Polk County has also been critically influenced by the wood-products industry. At one time or another, more than 150 locations in the county have been milling, logging, and/or rail-transportation sites. Most of the lumber-related industries began operating during the 1870s and 1880s after the construction of the railroads. The first two railroads in the area were the Houston East & West Texas (now Southern Pacific) and the Trinity & Sabine (now defunct).

Prior to the twentieth century, cattle raising and timbering were the principal economic mainstays in this part of Texas. Oil and gas exploration, beginning near Beaumont in the early part of this century, significantly altered the economic structure of the area but not necessarily the settlement pattern. Thus, the population of the area during the historic period followed a traditional dispersed single-family rural homesite and small-amlet pattern with an overlay of oil and gas related industrial activities.

San Jacinto County was established out of portions of Walker County in 1870 with Coldspring as the county seat. A post office was established in Coldspring (formerly known as Coonskin) in 1847. In 1881, the Houston, East and West Texas Railroad was constructed along the southeastern corner of the county. The timber industry figured importantly in the development of the county and Coldspring. Between the 1880s and 1920s, almost six million acres of timber were cut. The Delta Land and Timber Company built a commissary there in 1926 (Wooster, 2002). The Civilian Conservation Corps established a camp for black youths in 1930 and operated it until 1937. The Coldspring Oil Field was discovered in 1945.

3.11.2 Previous Investigations

The earliest archeological investigations in the county were reconnaissance surveys conducted by the University of Texas at Austin (UT) in 1919. Additional reconnaissance efforts, test excavations, and more substantial investigations were conducted in the 1920s and 1930s by UT archeologists in Chambers, Galveston, Harris, and Polk counties (Kenmotsu and Perttula, 1993). One of the sites excavated in Polk County (41PK2) appears to be an 1820s to 1830s Alabama-Coushatta Indian settlement on a tributary of the Trinity River (Story et al., 1990; Kenmotsu and Perttula, 1993).

During 1940 to 1941, UT, with funding from the Works Progress Administration, carried out archeological surveys in Polk and other southeast Texas counties. These surveys, under the direction of G.E. Arnold, identified many archeological sites in these counties (Guy, 1990). However, no excavations were conducted at any of these sites.

During the 1960s, archeological investigations were conducted for the Lake Livingston Reservoir that encompassed portions of Polk, San Jacinto, Trinity, and Walker counties (Nunely, 1963). During this survey, archeological sites were recorded within and adjacent to the proposed lake. Seven of the sites recorded were subsequently tested during 1965 and 1966 (McClurken, 1968). During 1984 and 1985,

excavations were conducted at the Crawford Site (41PK69) by the Archeological Research Laboratory, Texas A&M University (Ensor and Carlson, 1988).

Other archeological investigations near this project area include the Lake Conroe investigations in Montgomery County (McNatt, 1978; Shafer 1968; Shafer and Stearns, 1975) and the survey at B.A. Steinhagen Lake in Tyler County (Horizon Environmental Services). Small-scale investigations have also been conducted for water and sewer improvements in San Jacinto County (Corbin, 1993) and for oil and gas interests (Moore, 1993).

More recently, Turpin and Sons, Inc. (Turpin, 2006) conducted a pipeline survey for Enbridge. Two archeological sites were recorded during this survey. Between September and October 2007 PBS&J conducted an archeological survey for the proposed Goodrich Pipeline Project in Houston, Trinity, and Polk counties (Cordova and Martin, 2007). The survey identified one previously unrecorded prehistoric site (41PK256).

3.11.3 Results of the literature and Records Review

A site file and records review was conducted for Polk and San Jacinto counties. The files at Texas Archeological Research Laboratory (TARL) and at the THC were both examined for the location of recorded archeological sites; the location of listed or determined eligible for listing NRHP properties; State Archeological Landmark (SAL) sites; and Texas Historic Markers (THM). Also reviewed were TxDOT's Master List of NRHP Eligible Bridges, and THC's Texas Historic Cemeteries database.

The file review was conducted utilizing the maps at TARL and the THC's Historic Sites Atlas and the Restricted Archeological Sites Atlas. This review identified 257 recorded archeological sites in Polk County. It also identified 4 SAL-designated sites, 2 NRHP-listed properties and 59 Texas THMs in the county. The records at TARL and the THC revealed no evidence of any previous cultural resource investigations and only two previously recorded cultural resource sites in the study area. The THC Historic Sites Atlas did not identify any NRHP-listed properties or SAL-designated sites in the study area.

The results of the file review for San Jacinto County revealed 206 recorded archeological sites in the county, four SAL-designated sites, two NRHP-listed properties, and 28 THMs. None of the recorded cultural resources in San Jacinto County occur in the study area.

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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/Soils

No significant effect on the geological resources of the area would result from construction of any of the alternative routes for the proposed transmission line. Activities associated with the construction of the line, such as the erection of structures and grading of temporary roads, construction areas, and staging areas, would have no measurable impacts on geological features or mineral resources. Clearing of vegetation associated with these activities would be minimized, and cleared areas would be revegetated with native grasses, where possible. Impacts from soil erosion caused by construction activity should be minimal because of the small degree of slope that generally occurs within the study area and the implementation of best management practices (BMPs) designed in the Storm Water Prevention Pollution Plan (SWPPP).

The construction and operation of transmission lines normally creates very few long-term adverse impacts on soils. Compaction and increased erosion where vegetation is cleared are the primary potential impacts to soils. Soil erosion is generally greatest during the initial clearing of the ROW, when most woody vegetation is removed to provide adequate space for construction activities and minimize corridor maintenance. Although construction of the proposed project would require the removal and/or disturbance of only small amounts of near-surface materials, erosion may still occur. Pre- and post-construction inspections would ensure the identification of problem erosion areas, and measures could be taken to reduce potential impacts. Following the completion of construction activities, disturbed areas, with the exception of previously forested areas, would quickly recover, either by assisted revegetation or natural succession. In either case, construction areas would be reclaimed naturally with species of grasses, forbs, and shrubs that occur in adjacent habitats or are native to the region.

Prime farmland soils, as defined by the NRCS, are those soils that are best suited for producing food, feed, forage, or fiber crops. The USDA recognizes the importance and vulnerability of prime farmlands throughout the nation and encourages the wise use and conservation of these soils where possible. The proposed project would cross prime farmland soils. In addition to construction-related impacts described above, the major impact of the project on prime farmland soils would be the physical occupation of small areas by single-pole structures and around any guy wires associated with angle structures. These areas would not be available for agricultural production and could become obstacles to farm machinery. The majority of the ROW, however, would be available for agricultural use once construction of the proposed transmission line is completed. The project is not expected to have a significant impact on prime farmland soils.

4.1.2 Impact on Water Resources

4.1.2.1 Surface Water

Construction and operation of the proposed transmission line would have little adverse impact on the surface water resources within the study area. Short-term disturbances from construction activities may result in the form of increased erosion and possible accidental spills of petroleum and other chemical products. Additionally, activities such as clearing of vegetation, may temporarily increase local stormwater runoff volumes and sediment loading. Potential impacts would be avoided whenever possible by spanning surface waters, diverting construction traffic around flowing streams via existing roads, and eliminating unnecessary clearing of vegetation. Although impacts would be avoided to the extent possible, some unavoidable impacts may occur. Use of existing ROW would minimize these impacts, as would reducing vegetation removal around stream banks and minimizing ground disturbance. The use of erosion-control measures, such as silt fences and selective clearing, and the implementation of BMPs regarding the use of chemicals would also minimize potential impacts. Impacts occurring from construction of the proposed transmission line would, however, be short term and minor because of the relatively small area that would be disturbed at any particular time and the short duration of the construction activities. No long-term adverse effects are anticipated.

The measurement of the various criteria used in the environmental analysis of the primary routes for this project is tabulated in Table 7-1 in Section 7.0 of this report. Comparing the proposed alternative routes with regard to potential surface water impacts, routes 1, 5, 6, and 7 cross one stream each, while Route 2 crosses two streams. Alternative routes 3 and 4 are the only routes without any stream crossings. Routes 5 and 6 are the only routes that have portions parallel to and within 100 ft of streams (approximately 515 ft each). Routes, 4, 6, and 7 do not cross any open water. In contrast, Route 5 crosses approximately 100 ft of open water, Route 3 crosses approximately 140 ft of open water, and routes 1 and 2 each cross approximately 165 ft of open water. The open water is small farm ponds.

4.1.2.2 Floodplains

Proposed construction may result in locating some transmission line structures within 100-year floodplains and wetlands. These structures would be designed and constructed so as not to impede the flow of any waterway or create any hazard during flooding. Construction activities in floodplains would be limited to the project ROW, and structures would not be located in obvious flood channels. Some scouring could occur around structures if flood-flow depths and velocities become great enough. This project is not expected to impact the function of the floodplain. No adverse effects from flooding to adjacent downstream property owners are anticipated as a result of constructing this transmission line. Routes 1 and 2 are the only routes that cross 100-year floodplains at 2,125 ft and 2,750 ft, respectively (see Table 7-1). Impacts are expected to be minor.

According to FWS NWI mapping for the study area, approximately 100 ft of potential emergent wetland is crossed by routes 1 and 2. Therefore, routes 1 and 2 have the greatest potential for impacting wetlands;

however, if the area as indicated by the NWI is truly a wetland, impacts could be avoided by spanning. Activities associated with electrical transmission facilities in wetlands are typically regulated by the USACE under the Clean Water Act of 1972. ETEC will adhere to guidelines established under Section 404 of the Clean Water Act that are designed to minimize impacts to wetlands, will take measures to specifically identify these sensitive areas, and will coordinate with the USACE, as necessary, regarding impacts to wetlands that would otherwise result from this project.

4.1.2.3 Groundwater

No adverse impacts to groundwater are expected to occur from the construction, operation, and maintenance of the proposed transmission line. The amount of recharge area disturbed by construction is minimal when compared with the total amount of recharge area available for the aquatic systems in the region. Additionally, the accidental spillage of fuel, lubricants, or other petroleum products from normal operation of heavy equipment during construction activities is unlikely to result in any groundwater contamination. Any accidental spills would be addressed in accordance with state and federal regulations, and ETEC and its contractors will take precautions to avoid and minimize the occurrence of such spills. An SWPPP prepared specifically for this project will involve the implementation of BMPs that will significantly reduce the risk of sediment and contaminants leaving the ROW.

4.1.3 Impacts on Terrestrial Ecosystems

4.1.3.1 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 or cropland may be temporarily unavailable for grazing or commercial crop production 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. As soon as possible after the construction of the transmission line, the ROW will be reseeded with native grasses or a cover or forage crop, if necessary, to facilitate erosion control.

Vegetation community types were verified in the field where possible and the approximate extent of the vegetation communities occurring along the alternative routes was determined by measuring the linear distance from digital color aerial photography and cross-referencing the measurements with USGS 7.5-minute topographic maps and FWS NWI maps. Potential bottomland/riparian woodland impacts were based on NWI and floodplain mapping, in addition to the aerial photography and results of an ecological survey of the study area. As noted above, the results of these measurements are presented in Table 7-1 (Section 7.0) and are discussed below.

Upland woodland is crossed by all seven alternative routes. Alternative Route 5 crosses the least amount of upland woodland (65 ft), followed by routes 1 (175 ft), 3 (290 ft), 4 (415 ft), 6 (535 ft), 7 (935 ft), and 2 (7,120 ft). Alternative routes 1 and 2 are the only routes that cross bottomland/riparian woodland at 340 ft and 640 ft, respectively. Removal of vegetation in woodland communities increases the potential for erosion and sedimentation, which can be detrimental to downstream plant communities. Placement of rock berms, siltation fences, or brush barriers downslope of disturbed areas would help dissipate the flow of runoff at stream and drainage crossings. Placement of silt fences or hay-bale dikes between streams and disturbed areas would also help prevent siltation of the waterway.

Of the seven alternative routes, Route 5 would have the least impact on woody vegetation. This route crosses the least amount of woodland: only approximately 65 ft of upland woodland and no bottomland/ riparian woodland. It crosses no potential wetlands, although typically wetlands can be spanned. Route 6 is ranked second from a vegetation standpoint, crossing approximately 290 ft of upland woodland and no bottomland/riparian woodland or potential wetlands. Route 4 is the third choice, crossing approximately 415 ft of upland woodland and no bottomland/riparian woodland or potential wetlands. Route 2 is the least desirable from a vegetation standpoint because it crosses the most woodland (approximately 7,120 ft of upland woodland and 640 ft of bottomland/riparian woodland). Alternative Route 7 is the second-least desirable from a vegetation standpoint, crossing approximately 935 ft of upland woodland.

Once vegetation is removed or disturbed near streams, the potential for erosion and sedimentation increases. Placement of erosion control devices downstream of areas disturbed by construction activities would help to check the flow of runoff toward the stream or tributary crossings. In close proximity to streams, erosion control measures would be positioned between the disturbed area and the waterway to prevent siltation into any waters of the U.S. Placement of fill material within waterways and jurisdictional wetlands can be subject to USACE regulations. As noted above, each primary route makes between zero and two stream crossings.

4.1.3.2 Wildlife

The impacts of transmission lines on wildlife can be divided into short-term effects resulting from physical disturbance during construction and long-term effects resulting from habitat modification. The net effect on local wildlife of these two impact types is typically 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 each primary route.

During the clearing of the transmission line ROW, animals of lesser mobility and size may be impacted and suffer some loss of habitat by the actions of mechanical clearing by machinery. The noise and physical activity of work crews and machinery might temporarily disturb the normal behavior of certain species. Impacts to mobile, earthbound species such as small mammals, amphibians, and reptiles are typically minor and temporary, although the nests of small mammals and others may be lost during clearing or construction. Some animals, being temporarily deprived of cover, may be subject to increased natural predation. Ground-dwelling animals may be negatively impacted by soil compaction caused by heavy machinery. Wildlife in the immediate area may experience a slight loss of browse or forage material resulting from the clearing or shredding of woodland/brushland within the ROW; however, the prevalence of similar habitats in adjacent areas will minimize the effects of this loss. In addition, the regrowth of herbaceous and brushy/shrubby vegetation in the ROW following construction will also help to offset the effects of this loss.

The increased noise and activity levels during construction could potentially disturb breeding or other activities of species inhabiting the areas adjacent to the ROW. Dust and gaseous emissions should 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 should 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.

Impacts of transmission lines on birds are considered to be both positive and negative. Much of the published information comes from the Avian Power Line Interaction Committee (APLIC), a collaboration between FWS and power companies to address issues of avian protection and electric power reliability. Positive impacts of transmission lines and structures on avian species, particularly raptors, include additional nesting and roosting sites and resting and hunting perches, particularly in open, treeless habitats (Olendorff et al., 1981; APLIC, 1994, 1996). The red-tailed hawk (*Buteo jamaicensis*), turkey vulture, American crow, American kestrel (*Falco sparverius*), mourning dove, loggerhead shrike (*Lanius ludovicianos*), and eastern meadowlark are a few of the more common species that may take advantage of these benefits. By such benefits, transmission lines have significantly increased raptor populations in several areas of the U.S. (APLIC, 1996). Additionally, edge-adapted species (e.g. blue jay, some flycatchers, northern cardinal, northern bobwhite, Cooper's hawk (*Accipiter cooperii*), brown-headed cowbird, and northern mockingbird) may flourish along changed vegetation areas adjacent to the transmission ROW (Rochelle et al., 1999).

Adverse impacts to avian species from electric transmission lines range from conductor, ground wire, and structure interactions (electrocution and/or collision) to habitat loss and fragmentation from ROW construction and maintenance. Sources of annual avian mortality estimates compared in APLIC (2006)

and Erickson et al. (2005) indicate that the most significant anthropogenic (human-influenced) causes of avian mortality, other than habitat destruction, are window/building collisions (97 to 980 million), electric transmission line collisions (up to 174 million), vehicle collisions (60 to 100 million), cats (39 to 100 million), poisoning (72 million), communication towers (4 to 50 million), and wind turbines (10 to 40 thousand) (APLIC, 2006). Although electrocution from electric powerlines (distribution and transmission lines) may claim thousands of birds per year, electrocution impacts are highly unlikely for this project. Typically, electrocution is not a threat from electric transmission lines greater than 69 kV, as the distance between conductors or conductor and structure or ground wire are greater than the wingspan of most birds (i.e., greater than 6 ft) (APLIC, 1996, 2006).

Habitat loss and fragmentation are other potential adverse impacts from transmission line construction and maintenance. Several studies indicate forest and grassland fragmentation have detrimental effects on some avian species that show a marked preference for large undisturbed and/or native habitat patches (Robbins et al., 1989; Terborgh, 1989; Faaborg et al., 1992; Hagan et al., 1996; Rochelle et al., 1999; Herkert et al., 2003). Species are not randomly distributed with regard to habitat patch size, and fragmentation favors edge- and small-patch-adapted species. For those species dependent on larger patches and less adapted to edge, increases in woodland or forest edge effect can increase predation, brood parasitism, invasive species introduction, and reduce mating and nesting success. Changes in contiguous prairie habitats can do the same.

The transmission line (both structures and wires) could present a hazard to flying birds, particularly migrants. Collision may result in disorientation, crippling, or mortality (New York Power Authority, 2005). Mortality is directly related to an increase in structure height; number of guy wires, conductors, and ground wires; and/or use of solid or pulsating red lights (an FAA requirement on some structures) (Erickson et al., 2005). Collision hazards are greatest near habitat “magnets” (e.g., wetlands, open water, edges, and riparian zones) and during the fall when flight altitudes of dense migrating flocks 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). Most migrant species known to occur in the study area, including passerines, should be minimally affected during migration, since their normal flying altitudes are much greater than the heights of the proposed transmission structures (Willard, 1978; Gauthreaux, 1978). For resident birds or for birds during periods of nonmigration, those most prone to collision are often the largest and most common in a given area (Rusz et al., 1986; APLIC, 1994); however, over time, these birds learn the location of transmission lines and become less susceptible to wire strikes (Avery, 1978). Raptors, typically, are uncommon victims of transmission line collisions, because of 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).

While waterfowl (ducks, geese, swans, cranes, shorebirds, etc.) are among the birds most susceptible to wire strikes (Faanes, 1987; Erickson et al., 2005), it has been estimated that wire strikes (including

distribution lines) account for less than 0.1% of waterfowl nonhunting mortality, compared with 88% from diseases and poisoning and 7.4% because of weather (Stout and Cornwell, 1976). In some areas, hunting may affect 20 to 30% of waterfowl populations (Thompson, 1978). Suitable habitat for waterfowl does not occur within the study area, and the normal flying altitudes of any waterfowl migrating through the area are considerably greater than the heights of the proposed transmission towers. Therefore, no impacts to waterfowl are anticipated.

Collision potential and negative edge effects can be significantly reduced for some species through avian-safe routing and design (APLIC, 2006). Routing and individual structure placement to avoid intense bird use areas (e.g., communal foraging or roosting areas, rookeries, wetlands, etc.) and increasing line visibility are important considerations (Avery, 1978; Beaulaurier, 1981; APLIC, 1994, 2006). 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 midspan region. Where the transmission line would pass 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 marking the wires. Increasing wire visibility using markers, such as orange aviation balls, black-and-white ribbons, spiral vibration dampers, or avian flight diverters, particularly at mid-span, can 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 with unmarked lines. Negative edge effects can be reduced through native revegetation of disturbed construction areas where necessary and appropriate for safe and reliable operation. Additionally, where lighting is required due to aviation concerns, use of white strobe lighting is preferred over other options in order to reduce avian collision potential with taller facilities (Erickson et al., 2005). Lastly, nest management through platform design, equipment protection, and other physical disincentives to bird use and nesting can avoid negative impacts to birds and power reliability (APLIC, 2006).

In general, the greatest potential impact to wildlife would result primarily from the loss of habitat, particularly woodland habitat, and fragmentation of habitat. Woodland habitats are relatively static environments that require a greater regenerative time compared to pastureland, cropland, grassland, or emergent wetlands. Other considerations include having the ROW parallel to and within 100 ft of streams; crossing wetlands and waterbodies; the length of the line along existing ROW, and the total length of the line (see Table 7-1). Impacts to aquatic ecosystems will be negligible because most streams in the study area are intermittent and usually dry, and they would be spanned. Erosion-control measures would be employed at all crossings. Stock tanks and small ponds should receive no impact from the proposed transmission line because the line would span these waters.

Typically, because vegetation provides a major component of many species' habitats, the preferred route from a vegetation standpoint is usually also the preferred route from a wildlife standpoint. Alternative Route 5 is the preferred route from a wildlife standpoint because it crosses the least amount of woodland (approximately 65 ft of upland woodland). It crosses no bottomland/riparian woodland and no potential

wetlands. Route 3 is the second choice, crossing approximately 290 ft of upland woodland and no bottomland/riparian woodland or potential wetlands. Route 2 would require the most clearing of woodland (approximately 7,120 ft of upland woodland and 640 ft of bottomland/riparian woodland) and is thus the least desirable from a wildlife standpoint.

4.1.4 Impact on Aquatic Ecosystems

Typical aquatic impacts, related to the construction and operation of electric transmission facilities, are often the result of changes in water quality or available habitat. Sedimentation, stormwater volume increases, spills, and direct disruption of aquatic habitats commonly result from construction equipment or placement of structures. Sedimentation and turbidity caused by construction activities in or adjacent to streams, springs, or pools may clog respiratory or feeding structures, eliminate available habitat by covering bottom area, or inhibit the growth of plants, thus disrupting the food chain. These effects may be lethal to aquatic organisms, such as insect larvae and other macroinvertebrates, mussels, and adult, juvenile, and larval fish. Placement of transmission facilities through bottomland/riparian woodland, within wetland areas (when unavoidable), adjacent to (within 100 ft) of streams, and across floodplain is more likely to result in increased sedimentation because removal of vegetation in these areas would increase the potential for soil and other substrates to enter the waterbody. Construction activity and clearing in upland woodland areas can, however, lead to increased sedimentation and turbidity in nearby waterbodies.

Increased stormwater runoff can scour floodplain habitats, reducing biodiversity in the area by disrupting habitat. Additionally, higher nutrient levels often occur following increased runoff, especially following clearing activities. Elevated nutrients can stimulate algal production and shift species assemblages or cause algal blooms that may lower the available oxygen concentrations in the water at night or on cloudy days. Removal of riparian vegetation would increase runoff to nearby waterbodies. Therefore, impacts occurring in bottomland/riparian woodland or adjacent wooded areas could have more of an effect than impacts in agricultural areas. Additionally, agricultural land often contains streams with heavier sediment loads and higher levels of fertilizer and pesticides than would be found in less-disturbed wooded areas. As a result, aquatic habitats in these areas are often of lower ecological value because of low diversity and the presence of less-desirable species.

The accidental spilling or dumping of toxic compounds may be lethal to organisms nearby or downstream that are sensitive to water quality. Some toxic chemicals may be ingested or absorbed by algae or other organisms in low trophic (feeding) levels and passed up the food chain, increasing toxicity in each trophic level until lethal concentrations are reached.

Direct disruption of aquatic habitats is not likely to occur as a result of the proposed project because all waterbodies should be spanned, and erosion-control measures will be employed to reduce potential impacts. The severity of impacts at water crossings would be reduced when the proposed route is located adjacent to existing ROW, especially where that ROW is already cleared. Generally, wetlands can be

spanned, thus eliminating impacts associated with the placement of structures. Temporary impacts would occur, however, during construction. Disturbance of wetland areas can lead to increased sedimentation and turbidity and an overall disruption in wetland aquatic habitat. When placing structures in wetland habitat is unavoidable, long-term impacts would be limited to the immediate footprint of the structure.

Potential detrimental impacts to aquatic communities would be avoided whenever possible. Where impacts are unavoidable, they would be minimized using BMPs. Placement of rock berms, siltation fences, or brush barriers downslope of disturbed areas would help dissipate the flow of runoff at stream and drainage crossings. Placement of silt fences or hay-bale dikes between streams and disturbed areas would also help prevent siltation into the waterway. Any placement of fill material within waterways and wetlands would represent a permit action that may require notification of the USACE.

Comparing the proposed alternative routes with regard to potential aquatic impacts, routes 1, 5, 6, and 7 cross one stream each, while Route 2 crosses two streams. Alternative routes 3 and 4 are the only routes without any stream crossings. Routes 5 and 6 are the only routes that have portions parallel to and within 100 ft of streams (approximately 515 ft each). Routes, 4, 6, and 7 do not cross any open water. In contrast, Route 5 crosses approximately 100 ft of open water, Route 3 crosses approximately 140 ft of open water, and routes 1 and 2 each crosses approximately 165 ft of open water. These open water lengths represent small farm ponds.

Strictly from an aquatic standpoint, Route 4 is the preferred route because it crosses no bottomland/ riparian woodland, no potential wetlands, no streams, no waterbodies, no 100-year floodplain, and is not parallel to or within 100 ft of any streams. Route 7 is the second choice, crossing just one stream. Route 2 is the least desirable from an aquatic standpoint. It crosses approximately 640 ft of bottomland/riparian woodland, 100 ft of potential wetlands, 165 ft of open water, 2,750 ft of floodplain, and crosses two streams.

4.1.5 Impact on Endangered and Threatened Species

4.1.5.1 Endangered and Threatened Plant Species

As noted earlier in this report, the FWS and TPWD were consulted to determine whether the proposed project would affect any federally or state-listed endangered, threatened, proposed or candidate plant or animal species. Copies of correspondence with the FWS and TPWD are included in Appendix A. Only one federally/state-listed plant species has been recorded from Polk County—the Texas trailing phlox (FWS, 2008; TPWD, 2008b). No previously recorded occurrences of this plant have been documented in the study area or vicinity (TXNDD, 2008a, 2008b). Because of the absence of suitable habitat, it is unlikely that the species is present in the study area. No impact on endangered/threatened plant species is anticipated as a result of the project.

4.1.5.2 Endangered and Threatened Fish and Wildlife Species

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 3.7.2 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. Suitable habitat for many of the species does not exist in the study area. It is unlikely that the red-cockaded woodpecker occurs in the study area due to lack of suitable habitat. Only one route (Route 2) passes through any substantial wooded areas. An active bald eagle nest is located approximately 1,900 ft southwest of Segment J (routes 1 and 2). The eagles forage in the Trinity River west of the nest, even farther away from the primary routes. Regardless, routes 1 and 2 are less desirable than the other routes because they are the closest to the nest. The piping plover, peregrine falcon, swallow-tailed kite, and wood stork, if they occur in the study area, are likely to do so only as transitory migrants or postbreeding 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.

The Louisiana pinesnake, timber/canebrake rattlesnake, and Bachman's sparrow, 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 due to lack of suitable habitat and is highly unlikely to be impacted by the project. Rafinesque's big-eared bat, should it reside in the transmission line ROW, may be impacted by the proposed facility if its roosts are affected. As with small birds, bats are likely to leave the area during construction and avoid the transmission line once construction is completed. Texas trailing phlox, if it occurs in the transmission line ROW, may be impacted during initial vegetation clearing during construction.

Aquatic species such as the creek chubsucker, paddlefish, and alligator snapping turtle, if they occur in the ROW, are not expected to be impacted by the proposed project, since the aquatic habitat will be spanned. Regardless, precautions will be taken to minimize siltation influx into area streams: siltation controls and placement of structures outside of stream and spring areas would minimize or eliminate impacts.

Critical Habitat

As noted in Section 3.7.2, no critical habitat occurs within the study area. Therefore, no impact to critical habitat as a result of the proposed project will occur.

4.1.6 Summary of Impact on Natural Resources

Route 5 is the preferred route from an ecological perspective because it crosses the least amount of woodland and crosses no bottomland/riparian woodland or potential wetlands. Route 3 is ranked second

from an ecological standpoint, followed by Route 4. Route 3 crosses the second-least amount of woodland, crosses no bottomland/riparian woodland or potential wetlands, and is the shortest of the alternative routes. Route 4 crosses the third-least amount of woodland, crosses no bottomland/riparian woodland or potential wetlands, and is the second-shortest alternative route. None of these three routes crosses any 100-year floodplain. Route 2 is the least desirable (seventh) from an ecological standpoint. It crosses the most woodland (both upland and bottomland/riparian), the most potential wetlands, the most open water, the most streams, and the most 100-year floodplain. Furthermore, it is the longest alternative route. Route 1 is the second-worst route from an ecological perspective because it crosses the second-most amount of bottomland/riparian woodland, the second-most amount of floodplain, and is the second-longest route. Route 6 crosses less woodland than Route 7 and, thus, is ranked fourth, while Route 7 is ranked fifth from an ecological perspective.

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 ETEC 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 limited.

4.2.2 Impact on Community Values

As noted in Section 3.8.4, 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.

Impacts on community values can be classified into two areas: (1) direct effects, or those effects that would occur when 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 sections 4.2.4 and 4.2.7 of this report, respectively.

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 ETEC, 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 for this project include proximity to habitable structures (i.e., residences, businesses, schools, churches, hospitals, nursing homes, etc.), length parallel to existing ROW, length parallel to property lines, and overall route length.

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 seven primary alternative routes being evaluated, Route 1 has the greatest number of habitable structures located within 300 ft of its ROW centerline (14), followed by Route 2 with 13, and Route 4 with 12. Routes 3 and 5 have the fewest habitable structures (3) located within 300 ft of their respective ROW centerlines, while routes 6 and 7 have 4 each (see Table 7-1).

Paralleling existing transmission line ROW and other existing compatible ROW are important routing criteria identified by the PUC's substantive rules for transmission line certification. The least impact to land use generally results from locating new lines either within, or parallel to, existing ROW. All routes except Route 2 parallel some existing ROW. Route 4 parallels the most existing ROW (approximately 7,415 ft or 48% of its length), followed by Route 1 (approximately 4,515 ft [26%]), and routes 5, 6, and 7 (approximately 3,895 ft each or 24%, 24%, and 23% of their lengths, respectively). Route 3 parallels approximately 2,615 ft (18%) of existing ROW, while Route 2 parallels no existing ROW.

Paralleling property lines, where existing compatible ROW is not available, is another positive routing criterion and was part of the PUC's 2001 amendment to its substantive rules regarding transmission line certification. Property lines that occur along existing ROW (e.g., roads, transmission lines) were not included in this category, as the intent was to parallel the ROW and not the property line. In this regard,

Route 2 parallels the greatest length of property lines (approximately 11,560 ft or 62% of its length), although it parallels no existing ROW. Route 2 is followed by routes 1 and 5 (approximately 8,175 ft [47%] and 5,040 ft [31%], respectively). By comparison, Route 6 parallels no property lines and Route 7 only approximately 880 ft (5%).

Finally, the overall length of a particular alternative route can be an indicator of the relative level of land use impact. That is, generally (all other things being approximately equal), the shorter the route, the less land is crossed and the fewer potential impacts will result. In this regard, Route 3 is the shortest route at approximately 14,805 ft (2.8 miles), followed by Route 4 (approximately 15,310 ft or 2.9 miles), and Route 5 (approximately 16,220 or 3.1 miles). By comparison, Route 2 is the longest alternative at approximately 18,745 ft (3.6 miles).

The proposed transmission line would have a minimal effect on electronic communication operations in the area. No AM radio transmitters occur within the study area. All of the alternatives, however, are within 2,000 ft of two electronic communications towers. One is located near the proposed powerhouse/substation near the dam, while the other is located just southwest of the Rich Substation.

4.2.4 Impact on Recreation

Potential impacts to recreational land uses include the disruption or preemption of recreational activities. Southland Park, which is owned and operated by Polk County is located in the northwest portion of the study area, on Recreational Road 5 off of FM 1988. However, this park has been closed to the public and no longer serves as a park. Regardless, while no alternative routes cross the park, because of the proximity of the proposed new substation, all routes cross within 1,000 ft of the prior park.

4.2.5 Impact on Agriculture

Potential impacts to agricultural land uses include the disruption or preemption of farming activities. Disruption may include the time lost going around, or backing up to, structures in order to cultivate as much area as possible, and the general loss of efficiency compared to plowing or planting unimpeded in straight rows. Preemption of agricultural activities refers to the actual amount of land lost to production directly under the structures. 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. Construction-related activities could slightly impact agricultural production, depending upon the timing of construction related to the local planting and harvesting schedule.

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 (pastureland), followed by cultivated

cropland. Typically, the alternative land uses to grazing in this area are forestland, surface water, or residential. Potential impacts to agriculture lands by transmission lines are generally considered having the least degree of potential impact of all land uses, with forested lands having the highest degree of potential impact. Because the study area is dominated by pastureland, and because forests and residential areas were avoided as much as feasible, all routes cross a significant amount of pastureland/grazingland. Route 2 crosses the least amount of pastureland/grazingland (approximately 10,510 ft), while Route 5 crosses the most (approximately 15,965 ft). Because the ROW for this project will not be fenced or otherwise separated from adjacent lands, no significant long-term displacement of farming or grazing activities will result. Most existing agricultural land uses may be resumed following construction. No cropland or pastureland irrigated by circle-pivot or other aboveground means in the study area was identified either on aerial photography or during PBS&J's field surveys.

4.2.6 Impact on Transportation/Aviation

Potential impacts to transportation include temporary disruption of traffic and conflicts with proposed roadway and/or utility improvements, and increased traffic during construction of the proposed project. Such impacts, however, are usually temporary and short-term. All seven primary routes cross FM 1988 once. In addition, routes 1 and 2 also cross FM 3278 once. ETEC would need to acquire road-crossing permits from TxDOT for all state-maintained roads/highways crossed by the proposed transmission line.

According to FAA Regulations, Part 77 (FAA, 1975), notification of the construction of the proposed transmission line would be required if structure heights exceed the height of an imaginary surface extending outward and upward at a slope of 100 to 1 for a horizontal distance of 20,000 ft from the nearest point of the nearest runway of a public or military airport having at least one runway longer than 3,200 ft. If a runway is less than 3,200 ft, notification would be required if structure heights exceed the height of an imaginary surface extending at a slope of 50 to 1 for a distance of 10,000 ft. Notification is also required for structure heights exceeding the height of an imaginary surface extending outward and upward at a slope of 25 to 1 for a horizontal distance of 5,000 ft from the nearest point of the nearest landing and takeoff for heliports.

Construction of the proposed transmission line along any of the proposed alternative routes would not require FAA notification with respect to the above criteria, as no public, private, or military airports or heliports are located within 20,000 ft of the proposed alternative routes.

4.2.7 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, PBS&J conducted field surveys to determine the 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, particular scenic vistas that were encountered during the field surveys, and FM roads that cross the study area. Measurements were made to estimate the length of each primary alternative route that would fall within recreational or major highway foreground visual zone (0.5 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, in conjunction with the field visit.

Construction of the proposed 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, the brush and wood debris could have a temporary negative effect on the local visual environment. Permanent impacts from the project would involve the views of the structures and lines as well as views of cleared ROW.

No U.S. or state highways are located within the study area. However, two FM roads, FM 988 and FM 3278, occur within the study area. A portion of each alternative route would be visible from either or both of these two roads. Route 7 would have the least amount within the foreground visual zone of FM roads (approximately 1,190 ft), followed by routes 6 and 5 with approximately 4,040 ft and 4,425 ft, respectively. Route 4 would have the greatest amount within the foreground visual zone with approximately 10,515 ft (2 miles), followed by Route 1, with approximately 9,610 ft (1.8 miles), and Route 2 (approximately 9,150 ft or 1.7 miles).

As noted above, Southland Park has been closed to the public and no longer serves as a park. Two RV parks are located in the study area, one on either side of the Trinity River. The proposed line would not be visible from either of these two parks. Thus, no recreational areas will be visually impacted by the proposed transmission line.

Two cemeteries are located within the study area. Victory Place Cemetery is located off of FM 1988, while the second cemetery is located near the Trinity River just off FM 3278. Portions of all routes except for Route 7 would be visible from either or both of these cemeteries. Routes 1 and 2 would have the greatest amount within the foreground visual zone with approximately 4,065 ft each, followed by Route 5 with approximately 2,790 ft. No schools or churches are within the foreground visual zone of any of the alternative routes.

4.2.8 Summary of Impact on Human Resources

The four primary criteria that the land use evaluation concentrated on were the number of habitable structures located within 300 ft of the centerline of each route, the amount of existing compatible ROW paralleled, the amount of property lines paralleled, and the overall length. Routes 3 and 5 have the fewest habitable structures located within 300 ft of the transmission line centerline (3). Route 3 is also the shortest route. Therefore, Route 3 is the preferred choice from a land use perspective, followed by Route

5, which is the third-shortest route. Routes 6 and 7 each have four habitable structures within 300 ft of the centerline. Route 7 is slightly preferable to Route 6 because although it is slightly longer (by approximately 470 ft), Route 7 parallels more existing compatible ROW and property lines than Route 6 (approximately 28% of its length versus 24%), and is less visible from FM roads and cemeteries. Routes 1, 2, and 4 are the worst routes from a land use perspective having 14, 13, and 12 habitable structures within 300 ft of the transmission line centerline, respectively. Route 4 is ranked fifth because it has fewer habitable structures within 300 ft of the centerline than the other two routes and is also the second-shortest overall route. Route 1 (sixth) is slightly favored over Route 2 (seventh) despite having one more habitable structure within 300 ft of the centerline because it is shorter (by approximately 1,385 ft) and because it has more of its length paralleling existing compatible ROW and property lines (approximately 73% versus 62%).

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, archeological, 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. Impacts may be direct or indirect. As discussed in 36 CFR 800, adverse impacts on NRHP-listed or determined-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.

4.3.1 Direct Impacts

Direct impacts to known or unknown cultural resources sites may occur during the construction phase of the proposed transmission line. Direct impacts are caused by the actual construction of the line 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. ETEC, however, does not allow public access to its easements, most of which are on private property, further limiting access. Additionally, the integrity of the character of any unrecorded, significant historic structures could also be visually impacted by the construction of the proposed transmission line.

4.3.2 Indirect Impacts

Indirect impacts include those caused by a project that occur later in time or are farther 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, archeological,

or cultural significance. Historical sites and landscapes could potentially be adversely impacted by the visibility of the transmission line.

4.3.3 Mitigation

The preferred form of mitigation for cultural resources is avoidance. An alternative form of mitigation of direct impacts can be developed for archeological 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 and landscaping considerations.

4.3.4 Summary of Impact on Cultural Resources

One of the methods utilized to assess an area's potential for cultural resources is to identify archeological high probability area (HPA). When identifying HPA, the topographic setting, environment, and availability of raw material, water, and subsistence resources are all taken into consideration. Generally, when defining HPA a distance relationship to a water resource is set that encompasses landforms within approximately 1,000 ft of any perennial and/or intermittent drainage. HPAs are located in an environmental setting that would have provided adequate food, lithic resources, or both. The geological processes are important because they have the potential for protecting the integrity of an archeological site by burying it within deep sediments or destroying it by erosional processes.

Seven primary routes consisting of various combinations of 19 segments were evaluated for the proposed project. Only two of the segments are located within 1,000 ft of a recorded archeological site: segments D and J are within 1,000 ft of site 41PK190. This site is a late-nineteenth-century family cemetery with three graves. A low iron fence surrounds the three tombstones. The current tombstones are replacement tombstones erected by descendants of the Bailey family and are not the original tombstones. The remaining 17 segments are not located within 1,000 ft of a recorded archeological site. None of the segments and therefore none of the primary alternative routes is within 1,000 ft of an NRHP-listed or determined-eligible for listing as a SAL-designated site or a THM.

Each of the 19 segments was individually assessed for HPA prior to the evaluation of the route in its entirety. Six of the segments, B, C2, O, P, S, and T, do not contain any HPA along their length. Segment E has the least amount of HPA with approximately 150 ft, while Segment L has the most HPA, with approximately 3,300 ft.

Although site 41PK190 is about 1,000 ft from segments D and J (routes 1 and 2), it is not anticipated that the proposed construction of the transmission line will have any impact on the cemetery. The site is not considered a constraint for selection of the preferred route, which was selected solely on the basis of the amount of HPA identified along its length. The route with the least amount of HPA, Route 3, has been ranked as the preferred route from a cultural resources perspective. It has approximately 1,850 ft of HPA. Route 4, with approximately 4,850 ft of HPA, is ranked second, closely followed by Route 7

(approximately 4,900 ft) and Route 6 (approximately 4,950 ft). All of these routes have less than 1 mile of HPA. The remaining three routes have more than 1 mile of HPA. Route 2, with approximately 5,350 ft of HPA, is ranked fifth, while Route 1 (approximately 5,900 ft) is ranked sixth. Route 5, with approximately 6,050 ft of HPA, is the least-preferred route and ranked seventh.

Section 5.0

Comments from Agencies and Officials

5.0 COMMENTS FROM AGENCIES AND OFFICIALS

The following local, state, and federal agencies and officials were contacted by letter dated December 20, 2007 by PBS&J to solicit comments, concerns, and information pertaining to potential environmental impacts, permits, or approvals for the construction of a 138-kV transmission line that would connect ETEC's proposed substation to be located immediately south of Lake Livingston Dam and adjacent to the proposed Lake Livingston Hydroelectric Generation Plant, to ETEC's existing Rich Substation located approximately 1.5 miles northwest of Goodrich in Polk County. A sample copy of PBS&J's letter and responses received as of the date of this report are included in Appendix A.

Local

- Polk County Judge
- Polk County Commissioner, Precinct 1
- Polk County Floodplain Administrator
- Superintendent, Goodrich Independent School District
- Superintendent, Livingston Independent School District
- San Jacinto County Judge
- San Jacinto County Commissioner, Precinct 1
- San Jacinto County Floodplain Administrator
- Superintendent, Coldspring-Oakhurst Independent School District
- Deep East Texas Council of Governments

State

- Texas Department of Transportation (TxDOT)
  - Department of Aviation
  - Environmental Affairs Division
- Texas Historical Commission (THC)
- Texas Water Development Board (TWDB)
- Texas Parks and Wildlife Department (TPWD)
- Texas Commission on Environmental Quality (TCEQ)

Federal

- National Park Service (NPS)
- Natural Resources Conservation Service (NRCS)

- Federal Emergency Management Agency (FEMA), Region VI
- U.S. Department of the Interior (DOI), Regional Environmental Officer
- U.S. Army Corps of Engineers (USACE), Galveston District
- U.S. Fish and Wildlife Service (FWS)
- Bureau of Indian Affairs (BIA), Southern Plains Region
- Federal Aviation Administration (FAA)
- U.S. Environmental Protection Agency (EPA), Region 6

As of the date of this report, written responses to the December 2007 letter have been received from the Polk County Judge and the Polk County Fire Marshal (local); TxDOT Division of Aviation, THC, and TWDB (state); and the NPS, NRCS, FEMA, DOI, USACE, FWS, and BIA (federal). In addition, verbal comments were received from the Polk County Judge. The following is a summary of the written comments made by these agencies/officials that have responded. Copies of the responses are located in Appendix A.

5.1 RESPONSES FROM LOCAL AGENCIES/OFFICIALS

The Honorable Judge John P. Thompson, Polk County Judge, indicated that he forwarded information to and requested comments from other local agencies and officials. Judge Thompson expressed his concern that consideration be given to landowners that every effort be made to ensure they maintain riverfront property.

In addition to his written response, Judge Thompson also talked with Rob Reid of PBS&J. The judge wanted to make sure we were aware that the Polk County Park below the dam was closing and that they would be willing to work with ETEC for the use of that land for the hydro facility or the substation, if needed. The judge also said that PBS&J's USGS map was out of date since it did not show the "old road below the dam." Mr. Reid informed him that ETEC was getting new aerial photography that should show everything. Judge Thompson also stated that ETEC should be aware of cemeteries in the transmission line routing and that he will "run his traps" and get back with PBS&J.

The Polk County Fire Marshall replied with a Polk County Commercial Construction Packet and instructions on how to obtain a Certificate of Occupancy. It was requested that the packet be completed and returned along with two sets of plans for plan review to National Fire Protection Association (NFPA) 101 standards. Upon completion of construction, the Fire Marshal indicated that a Final Inspection would be required prior to the issuance of a Certificate of Occupancy.

5.2 RESPONSES FROM STATE AGENCIES/OFFICIALS

The Aviation Division of TxDOT stated that no public-use airports or heliports occur within the study area. The agency further stated that if the criteria of Federal Aviation Regulations (FAR), Part 77 are met,

the FAA must be notified and that the appropriate forms and supporting documents are available on the internet.

The THC said that the study area has a high probability for containing significant resources and that several prehistoric sites had been recorded there. The agency recommended that a professional archeologist survey the project area; the investigation would include a pedestrian survey along with shovel testing and/or backhoe trenching depending upon the specific project impacts.

The TWDB simply stated that the scope of the request for comments goes beyond the agency's current program responsibilities.

TPWD responded that due to a lack of information regarding potential fish and wildlife impacts of the proposed project, it was not possible to adequately assess the potential impacts of the project upon fish and wildlife resources. The agency made several recommendations, including inventorying existing natural resources of the study area and avoiding impacts to vegetation, rare resources, water resources, and migratory birds, as well as providing recommendations concerning revegetation. TPWD also provided information regarding state and federally listed endangered, threatened, and rare species of potential occurrence in Polk and San Jacinto counties. Based on records at TXNDD, the bald eagle (*Haliaeetus leucocephalus*) and southeastern myotis (*Myotis austroriparius*) have been documented in or near the study area. Finally, the TPWD requested a copy of the Environmental Assessment for review and comment prior to application to the PUC for a CCN.

The TCEQ noted that because Polk County is currently unclassified or in attainment of the National Ambient Air Quality Standards (NAAQS) for all six criteria air pollutants, that general conformity in accordance with 40 CFR Part 93 and Title 30, Texas Administrative Code Section 101.30, does not apply. The TCEQ further noted that while any demolition, construction, rehabilitation, or repair project will produce dust and particulate emissions, these actions should pose no significant impact upon air quality standards, since standard dust mitigation techniques should easily control dust and particulate emissions. The agency recommended that the Environmental Assessment address actions that will be taken to prevent surface and groundwater contamination.

5.3 RESPONSES FROM FEDERAL AGENCIES/OFFICIALS

The NPS indicated that the agency had reviewed the project and determined that no parks would be affected and, therefore, that they had no comments.

The NRCS replied that it had evaluated the proposed area as required by the Farmland Protection Policy Act (FPPA). The agency noted that the powerline [ROW] may contain soils classified as Important Farmland, although the agency does not normally consider powerlines a conversion of Farmland because the soil can still be used after construction. The NRCS further noted that the Hydro Generation Plant will be located on soil that is not classified as Prime Farmland and attached a completed AD-1006 (Farmland

Conversion Impact Rating) form indicating the exemption and approval status of the proposed project. The agency also urged the use of accepted erosion control methods during construction.

The FEMA Region VI Federal Insurance and Mitigation Administration recommended contacting the Polk County Floodplain Administrator to determine whether a Floodplain Development Permit would be needed.

The DOI replied that it does not normally provide at the Departmental level a coordinated review or comments during preliminary planning or environmental analysis of proposed projects or for environmental assessments. However, the DOI noted that if the project involved an Environmental Impact Statement, the agency would review it. Since the project does not require an Environmental Impact Statement, the DOI recommended consulting directly with several other DOI bureaus.

The USACE responded with an acknowledgment of receipt for the request of a jurisdictional determination, assigned a regulatory project manager, and assigned an application file number. The agency noted that due to recent changes in federal regulations, decreased manpower, and an increase in development along the Texas coast, the current response time is a minimum of 60–90 days. The USACE also provided contact information.

The FWS responded with information to assist in meeting obligations under the ESA to determine whether suitable habitat for listed species is present at the project site. Completion of a habitat evaluation and/or any necessary surveys would result in one of the following determinations as defined by FWS: no effect, is not likely to adversely effect, or is likely to adversely effect. Depending upon the results of the determination, the FWS would either no longer require coordination or contact, would provide concurrence, or would require formal Section 7 Consultation. Regardless of the determination, the FWS recommended that a complete record be kept of the evaluation and steps leading to a determination of effect, the qualified personnel conducting the evaluation, habitat conditions, site photographs, and other related articles.

The BIA indicated that since no tribal or Individual Indian trust lands are located within the study area, it has no jurisdiction with the study area. The BIA further indicated that it had no concerns that the proposed project will impact Indian trust lands within the Southern Plains Region jurisdiction. The agency recommended contacting the Alabama-Coushatta Nation of Texas and the Caddo Nation of Oklahoma as they have historic ties to the area and should be consulted to determine if they have some concern that the project would have the potential to impact important sites in their respective histories or cultural traditions.

Section 6.0

Public Open-House Meetings

6.0 PUBLIC OPEN-HOUSE MEETINGS

ETEC held a public open-house meeting for its Lake Livingston-Rich 138-kV transmission line project. The meeting was held at the Livingston-Polk County Chamber of Commerce on March 27, 2008. Landowners along or within 500 ft of the alternative routes were invited, as well as local elected officials and area residents. Apart from the invitation letters, ETEC also publicized the meeting through local newspaper advertisements. The open-house meetings were 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-making process; and
- 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 ETEC and to the selection of a preferred route for the project. Information on public involvement is located in Appendix B.

At the open-house meeting, rather than a formal presentation in a speaker-audience format, ETEC representatives 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 ETEC representatives 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 ETEC representatives/PBS&J staff encourage more interaction from those citizens who might be hesitant to participate in a speaker-audience format.

ETEC representatives at the first station welcomed and signed visitors in, and handed out a questionnaire. The questionnaire solicited comments on citizen concerns as well as an evaluation of the information presented at the open-house meeting. A blank questionnaire is included in Appendix B. Completed questionnaires were received by ETEC either at the meeting or later, by fax or mail. Following is a summary of questionnaire responses received by ETEC at or before the announced ETEC deadline for returning completed questionnaires.

A total of 12 citizens/landowners signed in at the public open-house meeting held at the Livingston-Polk County Chamber of Commerce on March 27, 2008. Four of these 12 attendees submitted completed questionnaires.

All four respondents indicated that the need for the project had been adequately explained and that the exhibits and explanations of the need for the project were helpful. Asked to rank the areas that should be considered of greatest concern in routing a transmission line, agricultural land was ranked first, followed by residential areas or subdivisions, wildlife, historic sites, floodplains/wetlands, recreation/park areas, and existing ROW, respectively. Other factors considered important were safety, economic impact on landowners, aesthetics, and new ROW. Concerns included homes under or near the line, and disturbance to homesteads.

The questionnaire noted that power companies who serve urban areas typically utilize multiple transmission lines into substations to increase reliability. When asked whether this action was less important, as important, or more important for rural areas and consumers, one respondent thought the action less important, one as important, and the third as more important.

When asked the percentage weight among economics, environmental, and landowner concerns that should be applied in the routing analysis, landowner concerns came in at 82%, economics at 10%, and the environment at 8%. All four respondents requested a follow-up contact by ETEC to discuss the project in more detail.

Section 7.0

Preferred Route Selection

7.0 PREFERRED ROUTE SELECTION

PBS&J, with review and assistance from ETEC, evaluated numerous preliminary alternative routes for the proposed Lake Livingston-Rich 138-kV project, based on environmental/land use criteria and public/agency input. ETEC also took into consideration engineering, cost, operation, and maintenance factors, as well as future needs. The resulting routes were presented to the general public at an open-house meeting held in March 2008. As noted in Section 2.0, as a result of the ongoing evaluations and public meeting, these routes were narrowed down to seven primary alternative routes. These seven primary alternative routes were then subjected to a detailed environmental analysis by PBS&J, and an engineering, cost, and future needs analysis by ETEC. A preferred route was selected from these seven primary alternative routes.

7.1 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/ aquatic ecology, land use/planning, and cultural resources) evaluated the seven primary alternative routes. This evaluation was based on data collected for 36 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 7-1. 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/planning evaluation included the proximity to habitable structures (i.e., residences, businesses, schools, churches, hospitals, nursing homes, etc.), length paralleling existing ROW and property lines, and overall length. The main factors considered important in the ecological evaluation were the length across woodland, the length paralleling existing ROW, total length of the route, the length parallel to and within 100 ft of streams, and the potential impact to endangered species. The cultural resources evaluation focused 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 seven primary alternative routes in order of their potential environmental impact. These rankings are shown in Table 7-2. Although all seven alternative routes evaluated in this report are environmentally acceptable routes, it was the consensus of PBS&J evaluators that Route 3 was the most favorable alternative after evaluating the objective criteria.

TABLE 7-1

ENVIRONMENTAL DATA FOR ALTERNATIVE ROUTE EVALUATION
LAKE LIVINGSTON-RICH 138-KV TRANSMISSION LINE PROJECT

CRITERIA	ALTERNATIVE ROUTES 1	2	3	4	5	6	7
LAND USE							
1. Length of alternative route	17,360	18,745	14,805	15,310	16,220	16,435	16,905
2. Number of habitable structures[1] within 300 ft of ROW centerline	14	13	3	12	3	4	4
3. Length of ROW parallel to existing ROW (transmission lines, highways, roads, pipelines,	4,515	0	2,615	7,415	3,895	3,895	3,895
4. Length of ROW parallel to property lines not following existing ROW	8,175	11,560	2,740	2,030	5,040	0	880
5. Number of parks/recreational areas[2] crossed by ROW	0	0	0	0	0	0	0
6. Length of ROW across parks/recreational areas[2]	0	0	0	0	0	0	0
7. Number of parks/recreational areas[2] within 1,000 ft of ROW centerline	0	0	0	0	0	0	0
8. Length of ROW across cropland	0	0	0	0	0	0	0
9. Length of ROW across pastureland/grazingland	15,740	10,510	14,540	14,045	15,965	15,475	15,555
10. Length of ROW across cropland or pastureland with mobile irrigation systems	0	0	0	0	0	0	0
11. Number of pipeline crossings	0	1	0	0	0	0	0
12. Number of transmission line crossings	0	0	0	0	0	0	0
13. Number of U.S. and State highway crossings	0	0	0	0	0	0	0
14. Number of Farm-to-Market road crossings	2	2	1	1	1	1	1
15. Number of FAA-registered airports within 20,000 ft of ROW centerline	0	0	0	0	0	0	0
16. Number of private airstrips within 10,000 ft of ROW centerline	0	0	0	0	0	0	0
17. Number of heliports within 5,000 ft of ROW centerline	0	0	0	0	0	0	0
18. Number of commercial AM radio transmitters within 10,000 ft of ROW centerline	0	0	0	0	0	0	0
19. Number of FM radio transmitters, microwave and other electronic installations within 2,000 ft of ROW centerline	2	2	2	2	2	2	2
AESTHETICS							
20. Estimated length of ROW within foreground visual zone[3] of U.S. and State highways	0	0	0	0	0	0	0
21. Estimated length of ROW within foreground visual zone[3] of Farm-to-Market roads	9,610	9,150	6,550	10,515	4,425	4,040	1,190
22. Estimated length of ROW within foreground visual zone[3] of parks/recreational areas[2]	0	0	0	0	0	0	0
23. Estimated length of ROW within foreground visual zone[3] of churches, schools, and	4,065	4,065	2,390	1,940	2,790	250	0
ECOLOGY							
24. Length of ROW across upland woodland	175	7,120	290	415	65	535	935
25. Length of ROW across bottomland/riparian woodland	340	640	0	0	0	0	0
26. Length of ROW across potential wetlands according to National Wetlands Inventory (NWI)	100	100	0	0	0	0	0
27. Length of ROW across known habitat of endangered or threatened species	0	0	0	0	0	0	0
28. Number of stream crossings	1	2	0	0	1	1	1
29. Length of ROW parallel to and within 100 ft of streams	0	0	0	0	515	515	0
30. Length of ROW across open water (lakes, ponds)	165	165	140	0	100	0	0
31. Length of ROW across 100-year floodplains	2,125	2,750	0	0	0	0	0
CULTURAL RESOURCES							
32. Number of recorded historic or prehistoric sites crossed by ROW	0	0	0	0	0	0	0
33. Number of recorded historic or prehistoric sites within 1,000 ft of ROW centerline	1	1	0	0	0	0	0
34. Number of National Register-listed or determined-eligible sites crossed by ROW	0	0	0	0	0	0	0
35. Number of National Register-listed or determined-eligible sites within 1,000 ft of ROW centerline	0	0	0	0	0	0	0
36. Length of ROW across areas of high archaeological/historic site potential	5,900	5,350	1,850	4,850	6,050	4,950	4,900

[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 are in feet.

Routes	Segments
1	B-D-J-L-S-T
2	B-D-J-M-O-P
3	B-E-F-H-T
4	B-E-F-I-S-T
5	B-E-G-R1-R2-T
6	C1-C2-R1-R2-T
7	C1-U-R2-T

TABLE 7-2

ENVIRONMENTAL RANKING OF PRIMARY ALTERNATIVE ROUTES
LAKE LIVINGSTON-RICH 138-KV TRANSMISSION LINE PROJECT

	Route				
Ranking	Land Use	Ecology	Cultural Resources	Project Manager	Consensus
1st	3	5	3	3	3
2nd	5	3	4	5	5
3rd	7	4	7	7	7
4th	6	6	6	6	6
5th	4	7	2	4	4
6th	1	1	1	1	1
7th	2	2	5	2	2

The four primary criteria that the land use evaluation concentrated on were the number of habitable structures located within 300 ft of the centerline of each route, the amount of existing compatible ROW paralleled, the amount of property lines paralleled, and the overall length. Routes 3 and 5 have the fewest habitable structures located within 300 ft of the transmission line centerline (3). Route 3 is also the shortest route. Therefore, Route 3 is the preferred choice from a land use perspective, followed by Route 5, which is the third-shortest route. Routes 6 and 7 each have four habitable structures within 300 ft of the centerline. Route 7 is slightly preferable to Route 6 because although it is slightly longer (by approximately 470 ft), Route 7 parallels more existing compatible ROW and property lines than Route 6 (approximately 28% of its length versus 24%), and is less visible from FM roads and cemeteries. Routes 1, 2, and 4 are the worst routes from a land use perspective having 14, 13, and 12 habitable structures within 300 ft of the transmission line centerline, respectively. Route 4 is ranked fifth because it has fewer habitable structures within 300 ft of the centerline than the other two routes and is also the second-shortest overall route. Route 1 (sixth) is slightly favored over Route 2 (seventh) despite having one more habitable structure within 300 ft of the centerline because it is shorter (by approximately 1,385 ft) and because it has more of its length paralleling existing compatible ROW and property lines (approximately 73% versus 62%).

Route 5 is the preferred route from an ecological perspective because it crosses the least amount of woodland and crosses no bottomland/riparian woodland or potential wetlands. Route 3 is ranked second from an ecological standpoint, followed by Route 4. Route 3 crosses the second-least amount of woodland, crosses no bottomland/riparian woodland or potential wetlands, and is the shortest of the alternative routes. Route 4 crosses the third-least amount of woodland, crosses no bottomland/riparian woodland or potential wetlands, and is the second-shortest alternative route. None of these three routes crosses any 100-year floodplain. Route 2 is the least desirable (seventh) from an ecological standpoint. It crosses the most woodland (both upland and bottomland/riparian), the most potential wetlands, the most open water, the most streams, and the most 100-year floodplain. Furthermore, it is the longest alternative route. Route 1 is the second-worst route from an ecological perspective because it crosses the second-

most amount of bottomland/riparian woodland, the second-most amount of floodplain, and is the second-longest route. Route 6 crosses less woodland than Route 7 and, thus, is ranked fourth, while Route 7 is ranked fifth from an ecological perspective.

The cultural resources evaluator selected Route 3 as the preferred alternative route, followed by routes 4 and 7, respectively. Because no recorded historic/prehistoric sites or NRHP-listed or NRHP-eligible sites are crossed or located within 1,000 ft (except routes 1 and 2, which are approximately 1,000 ft away) of any of the seven alternative routes, the cultural resources selection is based on the amount of HPA crossed. Route 3 crosses the least amount of HPA, followed by routes 4, 7, 6, 2, and 1, respectively. Route 5 is the least desirable from a cultural resources standpoint because it crosses the most HPA.

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 3 is the first choice, closely followed by Route 5. Route 3 was ranked first by three of the evaluators and second by the fourth evaluator. Route 5, the second choice, was ranked first by one evaluator and second by two evaluators. Route 7 is the consensus third choice.

7.2 ETEC'S EVALUATION

Following a review of PBS&J's alternative route analysis, and taking into consideration public and agency input, and engineering, ROW and cost factors, ETEC concurred with PBS&J's recommendation of the preferred route and the ranking of the remaining six alternative routes. They are as follows: Route 3 (preferred route) and routes 5, 7, 6, 4, 1, and 2 (alternate routes). The paths of these routes, along with the location of habitable structures and other land-use features in the vicinity of the preferred/alternate routes are shown on Figure 7-1 (map pocket), as well as being presented in tables 7-3 through 7-9.

TABLE 7-3
HABITABLE STRUCTURES AND OTHER LAND USE FEATURES
IN THE VICINITY OF ETEC'S PREFERRED ROUTE (ROUTE 3)
LAKE LIVINGSTON-RICH 138-KV PROJECT

No.	Structure/Feature	Distance from Centerline (ft)	Direction
2	Communications Tower	900	N
5	Commercial (Trinity Crossing convenience store)	150	NE
6	Commercial (Southland Park convenience store)	230	NE
22	Single-family Residence	200	E
36	Communications Tower	1,250 ft	SSW

TABLE 7-4

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES
IN THE VICINITY OF ETEC'S ALTERNATE ROUTE (ROUTE 5)
LAKE LIVINGSTON-RICH 138-KV PROJECT

No.	Structure/Feature	Distance from Centerline (ft)	Direction
2	Communications Tower	900	N
5	Commercial (Trinity Crossing convenience store)	50	SW
6	Commercial (Southland Park convenience store)	75	SW
22	Single-family Residence	200	E
36	Communications Tower	1,250 ft	SSW

TABLE 7-5

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES
IN THE VICINITY OF ETEC'S ALTERNATE ROUTE (ROUTE 7)
LAKE LIVINGSTON-RICH 138-KV PROJECT

No.	Structure/Feature	Distance from Centerline	Direction
1	Trinity River Authority Laboratory	250 ft	NW
2	Communications Tower	270 ft	NW
3	Single-family Residence	240 ft	N
4	Single-family Residence	150 ft	SE
22	Single-family Residence	200 ft	E
36	Communications Tower	1,250 ft	SSW

TABLE 7-6

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES
IN THE VICINITY OF ETEC'S ALTERNATE ROUTE (ROUTE 6)
LAKE LIVINGSTON-RICH 138-KV PROJECT

No.	Structure/Feature	Distance from Centerline	Direction
1	Trinity River Authority Laboratory	250 ft	NW
2	Communications Tower	270 ft	NW
3	Single-family Residence	240 ft	N
4	Single-family Residence	150 ft	SE
22	Single-family Residence	200 ft	E
36	Communications Tower	1,250 ft	SSW

TABLE 7-7

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES
IN THE VICINITY OF ETEC'S ALTERNATE ROUTE (ROUTE 4)
LAKE LIVINGSTON-RICH 138-KV PROJECT

No.	Structure/Feature	Distance from Centerline (ft)	Direction
2	Communications Tower	900	N
5	Commercial (Trinity Crossing convenience store)	150	NE
6	Commercial (Southland Park convenience store)	230	NE
7	Single-family Residence	250	NE
8	Single-family Residence	200	NE
15	Single-family Residence	300	SE
16	Single-family Residence	250	SE
17	Single-family Residence	180	SE
18	Single-family Residence	230	SE
19	Single-family Residence	270	SE
20	Mobile home	260	SE
21	Single-family Residence	150	S
22	Single-family Residence	200	E
36	Communications Tower	1,250 ft	SSW

TABLE 7-8

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES
IN THE VICINITY OF ETEC'S ALTERNATE ROUTE (ROUTE 1)
LAKE LIVINGSTON-RICH 138-KV PROJECT

No.	Structure/Feature	Distance from Centerline (ft)	Direction
2	Communications Tower	900	N
9	Commercial (Shiloh Bait and Tackle)	270	SE
10	Mobile home	190	SE
11	Single-family Residence	240	SE
12	Single-family Residence	150	SE
13	Single-family Residence	150	SE
14	Single-family Residence	150	SE
15	Single-family Residence	130	SE
16	Single-family Residence	130	SE
17	Single-family Residence	180	SE
18	Single-family Residence	230	SE
19	Single-family Residence	270	SE
20	Mobile home	260	SE
21	Single-family Residence	150	S
22	Single-family Residence	200	E
36	Communications Tower	1,250 ft	SSW

TABLE 7-9

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES
IN THE VICINITY OF ETEC'S ALTERNATE ROUTE (ROUTE 2)
LAKE LIVINGSTON-RICH 138-KV PROJECT

No.	Structure/Feature	Distance from Centerline (ft)	Direction
2	Communications Tower	900	N
23	Mobile home	300	N
24	Single-family Residence	200	N
25	Single-family Residence	140	N
26	Mobile home	130	N
27	Single-family Residence	200	N
28	Single-family Residence	200	W
29	Single-family Residence	200	W
30	Single-family Residence	200	W
31	Single-family Residence	90	W
32	Single-family Residence	90	W
33	Single-family Residence	200	W
34	Single-family Residence	90	W
35	Single-family Residence	250	W
36	Communications Tower	500 ft	E

Section 8.0

List of Preparers

8.0 LIST OF PREPARERS

This EA was prepared for ETEC by PBS&J. ETEC provided most of the information in Section 1.0, Description of the Proposed Project, and portions of Section 7.2, Preferred Route Selection. PBS&J employees with primary responsibilities for preparation of this document include the following:

Responsibility	Name	Title
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Section 9.0

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POWERHOUSE/ SUBSTATION

Swartout

Victory Place Cem

Southland Park

Baker Lake

Laurent Lake

Laurent Lake

Stock Pen Lake

Rich Substaton

FM 1988

FM 3278

PIPELINE

SAN JACINTO CO

POLK CO

Artesian Well

Guiding Star Ch

north

500 0 500 1000

scale in feet

PBS&J • Engineering • Environmental Consulting • Surveying

Base Map: USGS 7.5' Quadrangles: Blanchard, Camilla, Goodrich and Livingston, Texas

File: I:\projects\hc1\etec/441988/cadd/tx83c_ft\fig2_1.dgn

Vicinity Map

- Study Area Boundary
- Existing Transmission Line
- Alternative Route
- Alternative Route Segment
- 100-Year Floodplain
- Cemetery
- Park/Recreation Area
- Residential
- Electronic Communication Tower
- Cultural Resource Site
- Shipwreck

ROUTE	SEGMENT
1	B-D-J-L-S-T
2	B-D-J-M-O-P
3	B-E-F-H-T
4	B-E-F-I-S-T
5	B-E-G-R1-R2-T
6	C1-C2-R1-R2-T
7	C1-U-R2-T

Figure 2-1

ENVIRONMENTAL AND LAND USE CONSTRAINTS WITHIN THE STUDY AREA

LAKE LIVINGSTON TRANSMISSION LINE PROJECT

Revised: 07/09/08

N
north
500 0 500 1000
scale in feet

PBS&J
• Engineering
• Environmental Consulting
• Surveying

Alternative Route
Existing Transmission Line
(B) Alternative Route Segment

ROUTE	SEGMENT
1	B-D-J-L-S-T
2	B-D-J-M-O-P
3	B-E-F-H-T
4	B-E-F-I-S-T
5	B-E-G-R1-R2-T
6	C1-C2-R1-R2-T
7	C1-U-R2-T

Figure 2-4

PRIMARY ALTERNATIVE ROUTES

LAKE LIVINGSTON TRANSMISSION LINE PROJECT

Date of Photography: December 20, 2007

Revised: 07/09/08

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north

500 0 500 1000

scale in feet

PBS&J • Engineering • Environmental Consulting • Surveying

Vicinity Map

Preferred Route

Alternate Route

Existing Transmission Line

B Route Segment

1 Habitable Structure/Land Use Feature (See Tables 7-3 through 7-9)

ROUTE	SEGMENT
Preferred Route	
3	B-E-F-H-T
Alternate Route	
1	B-D-J-L-S-T
2	B-D-J-M-O-P
4	B-E-F-I-S-T
5	B-E-G-R1-R2-T
6	C1-C2-R1-R2-T
7	C1-U-R2-T

Figure 7-1

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES IN THE VICINITY OF THE PREFERRED AND ALTERNATE ROUTES

LAKE LIVINGSTON TRANSMISSION LINE PROJECT

Date of Photography: December 20, 2007

Revised: 07/09/08

File: I:\projects\lhc1\etec/441988/cadd/tx83c_ft/fig7_1.dgn

Appendix A

Agency Correspondence

PBS&J

An employee-owned company

December 20, 2007

Dear:

PBS&J Job No. 441988.00

East Texas Electric Cooperative, Inc. (ETEC) is proposing to construct a new 138-kilovolt (kV) transmission line in Polk County, Texas. The proposed line will connect ETEC's proposed substation, to be located immediately south of Lake Livingston Dam and adjacent to the proposed Lake Livingston Hydroelectric Generation Plant on the southeast shore of Lake Livingston, to ETEC's existing Rich Substation, located approximately 1.5 miles northwest of Goodrich in Polk County. The transmission line will be approximately 3-4 miles long, and constructed primarily on single poles within a 100-foot (ft) wide right-of-way (ROW). The study area is shown in the attached figure.

PBS&J is preparing an Environmental Assessment and Alternate Route Analysis for the proposed project that will support ETEC's application for a Certificate of Convenience and Necessity (CCN) from the Public Utility Commission of Texas (PUC). The environmental study will also be used to support ETEC's application to the Federal Energy Regulatory Commission for a license to construct and operate a hydroelectric generating plant at Lake Livingston dam. PBS&J is currently in the process of collecting and evaluating environmental data for the study area. As part of this effort, we are requesting that your agency/office relate any environmental or land use concerns that you may have regarding the potential environmental effects from the construction of these facilities within the designated study area. PBS&J would appreciate receiving your comments regarding the natural, cultural, or human resources within the vicinity of this project that are of concern to your agency/office.

Your comments will be an important consideration in both the selection and evaluation of alternative routes, as well as in the assessment of impacts. In addition, should you identify any area requiring permits, easements, or other approvals by your agency/office, or if you are aware of any major proposed development or construction in the study area, we would also appreciate receiving this information. If you have any questions concerning this project or our request for information, please call Mr. Derek Green or me at (512) 327-6840. Your earliest reply will be appreciated.

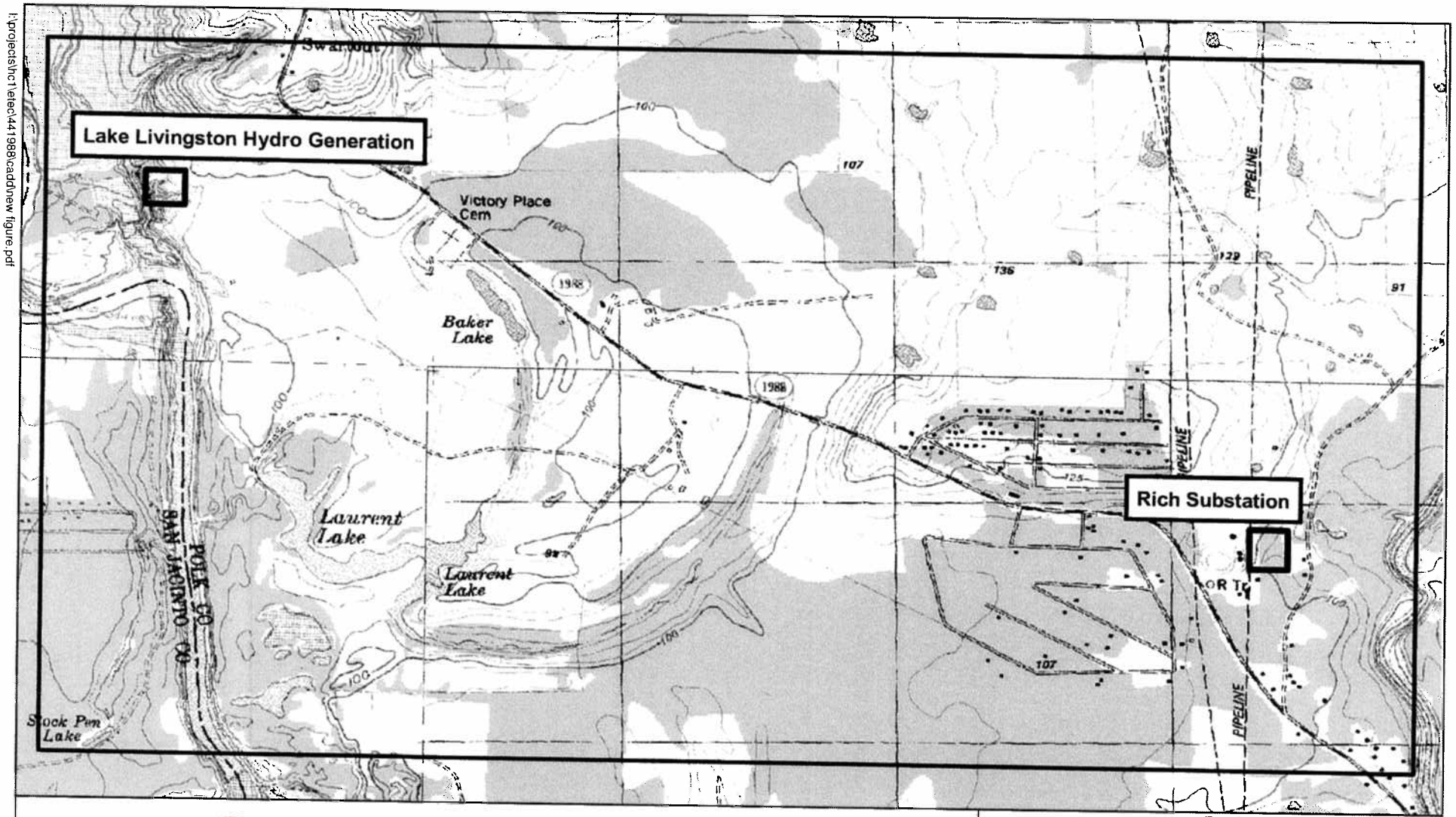
Sincerely,

Rob R. Reid
Vice President/Principal Project Director

cc: Edd Hargett, ETEC
George Kithas, Cornelius-Pierce Consulting Engineers, Inc.
Dan Wittliff, GDS
Derek Green, PBS&J

6504 Bridge Point Parkway • Suite 200 • Austin, Texas 78730 • Telephone: 512.327.6840 • Fax: 512.327.2453 • www.pbsj.com

I:\projects\hct\etec\441968\cadd\new figure.pdf



north

0 2000 4000 feet

Base Map: USGS 7.5' Quadrangles; Blanchard, Livingston, Camilla, and Goodrich Tx.

PBSJ

- Engineering
- Environmental Consulting
- Surveying

STUDY AREA
LAKE LIVINGSTON-RICH
138-KV TRANSMISSION LINE PROJECT

LOCAL AGENCIES/OFFICIALS CONTACTED
ETEC LAKE LIVINGSTON-RICH 138-KV TRANSMISSION LINE PROJECT

The Honorable John Thompson
Polk County Judge
101 West Church Street, Suite 300
Livingston, TX 77351-3246

Commissioner Robert C. Willis
Polk County, Precinct 1
P.O. Box 740
Goodrich, TX 77335-0740

Ms. Lisa Andreas
Polk County Floodplain Administrator
602 E Church St., Ste. 165
Livingston, TX 77351-4582

The Honorable Fritz Faulkner
San Jacinto County Judge
1 State Hwy 150, Room 5
Coldspring, TX 77331-7755

Commissioner Michael Griffith
San Jacinto County, Precinct 1
P.O. Box 997
Coldspring, TX 77331-0997

Ms. Nadine Hughes
San Jacinto County Floodplain Administrator
111 State Highway 150, Room C1
Coldspring, TX 77331-7757

Mr. Melvin Cummins
Superintendent, Coldspring-Oakhurst CISD
P.O. Box 39
Coldspring, TX 77331-0039

Dr. Guylene Robertson
Superintendent, Goodrich ISD
P.O. Box 789
Goodrich, TX 77335-0789

Mr. Darrell Myers
Superintendent, Livingston ISD
P.O. Box 1297
Livingston, TX 77351-1297

STATE/FEDERAL AGENCIES/OFFICIALS CONTACTED
ETEC LAKE LIVINGSTON-RICH 138-KV TRANSMISSION LINE PROJECT

Ms. Kathy Boydston
Wildlife Habitat Assessment Program
Texas Parks and Wildlife Department
4200 Smith School Road
Austin, TX 78744

Mr. William Mullican
Deputy Executive Administrator for Planning
Texas Water Development Board
1700 N. Congress Avenue.
Austin, TX 78701

Mr. Glenn Shankle
Executive Director
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, TX 78711-3087

Ms. Linda Howard
Manager, Planning & Programming
Texas Department of Transportation
Department of Aviation
125 E. 11th Street
Austin, TX 78701-2483

Ms. Dianna Noble
Director, Environmental Affairs Division
Texas Department of Transportation
125 E. 11th Street
Austin, TX 78701-2483

Mr. F. Lawerence Oaks
Executive Director
Texas Historical Commission
P.O. Box 12276
Austin, TX 78711-2276

Mr. Donald W. Gohmert
State Conservationist
Natural Resources Conservation Service
101 S. Main
Temple, TX 76501-7682

Mr. Walter G. Diggles, Executive Director
Deep East Texas Council of Governments
210 Premier Drive
Jasper, Texas 75951-7495

Col. David C. Weston
District Engineer and Commanding Officer
U.S. Army Corps of Engineers
P.O. Box 1229
Galveston, TX 77553-1229

Mr. Steve Parris, Field Supervisor
U.S. Fish and Wildlife Service, Clear Lake Field Office
17629 El Camino Real #211
Houston TX 77058-3051

Ms. Kyle M. Mills, P.E.
Regional Environmental Officer
Federal Emergency Management Agency
Region VI
Federal Center, 800 N. Loop 288
Denton, TX 76209-3698

Mr. Mike Nicely
Branch Manager
Texas Airport Development Office
Federal Aviation Administration
2601 Mecham Boulevard
Fort Worth, TX 73137-4298

Mr. Richard Greene
Regional Administrator
U.S. Environmental Protection Agency
Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas75202-2733

Ms. Chris Turk
Planning and Environmental Quality
Intermountain Support Office
Nation Park Service
12795 West Alameda Parkway
P.O. Box 25287
Denver, Colorado 80225-0287

Bureau of Indian Affairs
Southern Plains Region
W.C.D. Office Complex
PO Box 368
Anadarko, OK 73005-0368

Mr. Stephen R. Spencer
Regional Environmental Officer
U.S. Department of the Interior
Office of Environmental Policy and
Compliance
P.O. Box 26567 (MC-9)
Albuquerque, NM 87125-6567

JOHN P. THOMPSON
COUNTY JUDGE

Tuesday, January 15, 2008

Mr. Rob R. Reid
PBS&J
6504 Bridge Point Parkway
Austin, Texas 78730

Re: PBS&J Job No. 441988.00
East Texas Electric Cooperative, Inc. – Transmission Line

Dear Mr. Reid,

I am in receipt of your letter regarding the referenced project and your request for comments. I have taken the liberty of forwarding your letter to local officials representing the City of Goodrich, Goodrich Independent School District, Polk County Office of Emergency Management and the Trinity River Authority and asked that each provide my office with any information/comments that they wish to present. To date, I not received any such comments.

My one area of concern at the present time is that due consideration be given to private landowners and that every effort be made to ensure they maintain riverfront property.

Sincerely,

John P. Thompson
County Judge
Polk County, Texas

POLK COUNTY COURTHOUSE LIVINGSTON, TEXAS 77351 (936) 327-6813 FAX: (936) 327-6891

POLK COUNTY PERMITS

Friday, January 25, 2008

Rob R. Reid
PBS&J
6504 Bridge Point Parkway, Suite 200
Austin, TX 78730

Re: PBS&J Job No. 441988.00

Dear Mr. Reid:

We have enclosed a Polk County Commercial Construction Packet with the pages marked that need to be completed and returned.

Please submit two sets of plans for plan review to NFPA101 standards. When the construction is completed, there will be a Final Inspection. Following the Final Inspection, we will then issue a Certificate of Occupancy.

If you have any questions, please call 936-327-6826.

Sincerely,

Jay Barbee
Fire Marshal
Polk County

602 E. Church St. Suite 165 Livingston, Texas 77351 (936) 327-6826 FAX:(936) 327-6890

COMMERCIAL BUILDING PERMIT QUESTIONS

IF COST IS OVER $50,000.00
WE MUST HAVE AN EAB#

DATE: _____ TIME: _____

1. What are you building/renovating?

   _____

   _____

2. How big is it going to be?

   _____

3. Is there a 24-foot span?

   _____

4. How much is it going to cost to build/renovate?

   _____

5. Did an engineer draw up your plans? (NOTE: Under $50,000, the customer must still submit plans but they do not have to be drawn up by an engineer.)

   _____

6. Are your plans in compliance with ADA? (ADA - Americans with Disabilities Act)

   _____

7. Where is this going to be located? (address and directions)

   _____

   _____

8. Who is going to be your water company?_____
9. What is your company going to be named?

   _____

   _____

- - - - - - - - - - - - - - - - - - -

_____

Contact Name, Mailing Address including City, State, Zip, Telephone #, and Fax #.

POLK COUNTY FIRE MARSHALL

602 East Church Street, #136
Livingston, TX 77351

Telephone: 936-327-6820 **Facsimile: 936-327-6890**

Polk County Commissioner's Court has adopted the 2003 version of NFPA 101 Life Safety Code. Effective January 1, 2004, construction of commercial and public buildings as well as multi-family dwellings within the unincorporated area of Polk County, Texas, must, at a minimum, meet the requirements established by the above referenced code and the Texas Elimination of Architectural Barriers Act.

A change of occupancy in pre-existing buildings to commercial, public or multi-family use within the unincorporated area of Polk County, Texas will require a permit and must, at a minimum, meet the requirements established by the above referenced code and the Texas Elimination of Architectural Barriers Act.

Two sets of plans must be submitted upon application of a permit. As per the Texas State Engineering Practice Act, all buildings that are 5,000 sq.ft. or larger, or contains a clear span greater than 24 feet, must have a Texas licensed registered professional engineer's seal affixed to the complete set of plans.

The County will review the plans to ensure compliance with the NFPA 101 Life Safety Code prior to issuance of a permit.

The following fee schedule has been adopted and is based on the total value of the construction/renovation:

Under $1,000	No fee. If an inspection is required, a $50.00 fee for each inspection shall be assessed.
$1,000 to $50,000	$30.00 for the first $1,000 plus $5.00 for each additional $1,000 or fraction thereof.
$50,001 to $100,000	$260.00 for the first $50,000 plus $4.00 for each additional $1,000 or fraction thereof.
$100,001 to $500,000	$460.00 for the first $100,000 plus $3.00 for each additional $1,000 or fraction thereof.
$500,001 and up	$1,660.00 for the first $500,000 plus $2.00 for each additional $1,000 or fraction thereof

Fees for Building Fire Safety Inspection and Occupancy Certificate are included in the above fee schedule.

POLK COUNTY

_____

Jay Barbee
Fire Marshall

POLK COUNTY PERMITS

All new commercial construction or commercial remodels whose construction cost is $50,000.00 or more must be submitted for handicap accessibility review either by the State or a Registered Accessibility Specialist as per the Elimination of Architectural Barriers law. The law also states that a permitting office shall not issue a building permit without proof of submittal. The "EAB number" is the proof of submittal. Please see attachment for an example of a project registration form.

TEXAS DEPARTMENT OF LICENSING AND REGULATION

P.O. Box 12157, Austin, Texas 78711
(512) 463-6599 • (800) 803-9202 • FAX (512) 475-2871
customer.service@license.state.tx.us • www.license.state.tx.us

For Department Use Only

EABPRJ

IMPORTANT INSTRUCTIONS - PLEASE READ BEFORE BEGINNING

A project registration is not complete unless a complete set of construction documents and applicable fees are also submitted with this form to the Department, a Registered Accessibility Specialist, or a Contract Provider. Failure to submit any of these items will delay processing. Please print or type.

ARCHITECTURAL BARRIERS PROJECT REGISTRATION FORM

1. **Project Name**			
2. Project Address	City	Zip	County
3. **TENANT Name** (if other than owner)		Phone ( )	
4. Tenant Address	City	Zip	County
5. Contact Name		Phone ( )	
6. Contact Address	City	Zip	County
7. **BUILDING/FACILITY Name**			
8. Building /Facility Owner (Person or entity that holds title to property)		Phone ( )	
9. Owner Address	City	State	Zip
10. Contact Name (if other than owner)		Phone ( )	
11. Contact Address	City	State	Zip
12. **DESIGN FIRM**		Phone ( )	
13. Firm Address	City	State	Zip
14. Designer Name		**Email	
15. Type of License: (Check One) ☐ Architect ☐ Engineer ☐ Interior Designer ☐ Landscape Architect ☐ Other		License Number: (if applicable)	

PROJECT DESCRIPTION

16. Start Date (MM/YY):	17. Completion Date (MM/YY):	18. Estimated Cost: $

19. Type of Work: (Check One) ☐New Construction ☐Additions to Existing Bldg. ☐Alterations ☐Historic Preservation ☐Public Right-of-Way

20. Does this building(s) have more than one level? (Check One) ☐ Yes ☐ No

21. Are there any elevators, escalators, or platform lifts in this building? (Check One) ☐ Yes ☐ No

22. Type of Funds: (Check One) ☐ Public Funds or is a State Lease ☐ Privately Funded, on Private Land, for Private Use

23. State Lease No. (if applicable)

24. Scope of Work: (Detailed description of construction activities)

25. Intent to Comply: I hereby notify the Texas Department of Licensing and Regulation of my intent to comply with the provisions of Texas Government Code, Chapter 469.

Printed Name

Signature of Building Owner or Designated Agent | Date | ** Email

TDLR FORM AB05 03-07

NOTE: An individual who completes and files this form with the Texas Department of Licensing and Regulation (the Dept.) is entitled to the following:
1) to be informed about the information that the Dept. collects about the individual, upon their request and subject to a few exceptions;
2) to receive and review the information, under Sections 552.021 and 552.023 of the Texas Govt. Code; and
3) to have the Dept. correct information about the individual that is incorrect, under Section 559.004 of the Texas Govt. Code.

**The Department will add your address to the Architectural Barriers email notification list, which automatically provides Department information on matters affecting Architectural Barriers. Your email address is confidential pursuant to the Texas Public Information Act; the Department will not share it with the public. For additional information link to: http://www.license.state.tx.us/newsletters/TDLRnotificationLists.asp

COMMERCIAL BUILDING PERMIT APPLICATION
POLK COUNTY

Tracking Number: _____

Owner Name: _____ Telephone: _____
Address: _____ City: _____ State: _____ Zip: _____

Contractor Name: _____ Telephone: _____
Address: _____ City: _____ State: _____ Zip: _____
E-mail Address: _____

Type of Commercial Enterprise: _____

PROJECT ADDRESS: _____

Describe Project: _____

_____

_____

Project Cost: _____ Square Footage of Structure: _____

Start Date: _____ Estimated Completion Date: _____

T.D.L.R. Review Submitted: ☐ Yes ☐ No EAB Project Number: _____

Permit Fee Amount: $_____ Date Paid: _____

I affirm that the information provided above is true and correct to the best of my knowledge and that I understand this permit may be revoked if I have intentionally/knowingly provided incorrect or false information.

_____ _____
Owner/Owner's Agent Signature Date

_____
Print Name

FOR OFFICE USE ONLY:

Permit Issue Date: _____ Permit Fee Paid By: _____

Permit Issued By: _____ Payment Type: ☐ Cash ☐ Check #: _____
☐ Master Card ☐ Visa ☐ Discover

POLK COUNTY PERMITS

602 E. Church • Suite 165
Livingston, Texas 77351
(936) 327-6826 • (936) 327-6890 Fax

TYPE OF PERMIT _____ *FEE PAID* _____

APPLICATION FOR DEVELOPMENT AND ON-SITE SEWERAGE FACILITY PERMIT

NAME OF APPLICANT: _____
(Last) (First) (Middle)

MAILING ADDRESS: _____
(Street) (City) (State) (Zip)

911 ADDRESS (office use): _____

HOME TELEPHONE: _____ *CELL/BUS.#:* _____

ARE YOU A NEW POLK CO. RESIDENT: YES _____ *NO* _____

LOCATION OF PROPOSED CONSTRUCTION:

SUBDIVISION: _____ *SECTION* _____ *BLOCK* _____ *LOT* _____

DIRECTIONS TO PROPERTY: _____

_____

LOT DIMENSIONS: _____ *ACRES* _____

TYPE OF SOIL: _____

SEPTIC SYSTEM: PROPOSED _____ *EXISTING* _____ *HOLDING TANK* _____

WILL A LICENSED INSTALLER INSTALL YOUR SYSTEM? _____ *WHEN?* _____

IS THERE A PRIVATE/PUBLIC WELL WITHIN 100' / 150' OF PROPERTY? YES _____ *NO* _____

TYPE OF CONSTRUCTION _____ *COMMERCIAL* _____ *RESIDENTIAL* _____

NUMBER OF OCCUPANTS _____ *NUMBER OF BEDROOMS* _____ *NUMBER OF BATHROOMS* _____

GARBAGE DISPOSAL _____ *WASHING MACHINE* _____ *DISHWASHER* _____

EXISTING	**SQUARE FEET**	_____
NEW BUILDING	**SQUARE FEET**	_____
ADDITION TO BUILDING	**SQUARE FEET**	_____
MOBILE HOME – SW – DW	**SQUARE FEET**	_____ **YEAR** _____
COMMERCIAL	**SQUARE FEET**	_____

IS BUILDING IN THE FLOOD PLAIN? YES _____ **NO** _____

Authorization is hereby given to Polk County, Texas, Texas Department of Health, and the Texas Natural Resource Conservation Commission or their agents or designees, singularly or jointly, to enter upon the described property for the purpose of making soil evaluation test, inspecting septic systems, evaluating flood hazards or for any reason consistent with the water quality programs of the Texas Department of Health, and the Texas Natural Resource Conservation Commission.

_____ _____
Signature of Applicant **Date**

POLK COUNTY FIRE MARSHALL

602 East Church Street, #136
Livingston, TX 77351

Telephone: 936-327-6820 Facsimile: 936-327-6890

The companies/individuals listed below are approved by the Polk County Fire Marshall's Office to certify compliance with NFPA 101 and/or American's With Disabilities Act.

Beauford Chapman
Construction Code Consultants
1296 East FM 942
Livingston, Texas 77351

Telephone: 936-635-1022
936-398-2739

Don Maxwell
Handicapped Accessibility Inspections/Consultants
413 Shady Lane
Livingston, Texas 77351

Telephone: 936-967-0945 (ADA)
936-328-0521

Joe Versteeg
Versteeg Associates
86 University Drive
Torrington, Connecticut 06790

Telephone: 860-496-7089

Steve Unger
Hughes Associates
Dallas, Texas

Telephone: 972-529-9830

Warren Bonisch
Schirmer Engineering Corp
1701 North Collins Boulevard, Suite 235
Richardson, Texas 75080-3553

Telephone: 972-234-1617

FOR POLK COUNTY

YOU MUST CALL FOR A

FINAL INSPECTION

BEFORE

YOU OCCUPY

THE BUILDING

Texas Department of Transportation

AVIATION DIVISION
125 E. 11TH STREET • AUSTIN, TEXAS 78701-2483 • 512/416-4500 • FAX 512/416-4510

Mr. Robert R. Reid / PBS&J
6504 Bridge Point Parkway
Suite 200
Austin, Texas 78730

January 2, 2008

Dear Mr. Reid,

I received your letter dated December 20, 2007 concerning the proposed new electrical transmission line from Lake Livingston to the Rich substation, PBS&J job # 441988.

Title 14, US Code, Part 77 of the Federal Aviation Administration's (FAA) Federal Aviation Regulations (FAR) requires notice to the FAA if the facility to be constructed fits either of the below listed conditions:

77.13(1) Any construction or alteration of more than 200' above the surface of the ground at its location.

77.13 A 2 (i) Any vertical obstruction, temporary or permanent, that penetrates a 100 to 1 slope for a horizontal distance of 20,000 feet 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 feet in actual length, excluding heliports. (ii) 50 to 1 for a horizontal distance of 10,000 feet from the nearest point of the nearest runway of each airport specified in paragraph (a)(5) of this section with its longest runway no more than 3,200 feet in actual length, excluding heliports. (iii) 25 to 1 for a horizontal distance of 5,000 feet from the nearest point of the nearest landing and takeoff area of each heliport specified in paragraph (a)(5) of this section.

There are no public use airports or heliports in the study area.

If the criteria of FAR 77.13(1) is met, the FAA must be notified in four copies using FAA Form 7460-1, "Notice of Proposed Construction or Alteration". This form and supporting documents are available at <www.faa.gov/arp> - forms - construction. If you have any questions, please feel free to contact me at (512) 416-4507 or <wgunn@dot.state.tx.us>

Sincerely,

William B. Gunn

TEXAS HISTORICAL COMMISSION

The State Agency for Historic Preservation

RICK PERRY, GOVERNOR

JOHN L. NAU, III, CHAIRMAN

F. LAWERENCE OAKS, EXECUTIVE DIRECTOR

January 07, 2008

Rob Reid
Vice President/Principal Project Director
PBS&J
6504 Bridge Point Parkway, Suite 200
Austin, Texas 78730

Re: Project review under the Antiquities Code of Texas; East Texas Electric Cooperative, Inc.'s new 139kV line between newly proposed substation to existing Rich Substation, Polk County, Texas (PUC)

Dear Mr. Reid

Thank you for your correspondence describing the above referenced project. This letter presents the comments of the Executive Director of the Texas Historical Commission, the state agency responsible for administering the Antiquities Code of Texas.

The review staff, led by Debra L. Beene, has completed its review. The project area has a high probability for containing significant resources; several prehistoric sites have been recorded in the surveyed areas in the project area. We recommend that a professional archeologist survey the project area; the investigation should include pedestrian survey along with shovel testing and/or backhoe trenching depending upon the specific project impacts.

You can obtain lists of most professional archeologists in Texas on-line at www.rpanet.org or http://www.counciloftexasarcheologists.org. Please note that other professional archeologists meeting the qualifying standards may be used; see these standards athttp://www.cr.nps.gov/local-law/arch_stnds_9.htm. Please check the THC's web page for survey procedures at www.thc.state.tx.us/rulesregs/rrstate.html and follow the CTA's report guidelines http://www.thc.state.tx.us/rulesregs/RulesRegsPDF/CTA guidelines.pdf

Thank you for your assistance in this state review process, and for your efforts to preserve the irreplaceable heritage of Texas. **If you have any questions concerning our review or if we can be of further assistance, please contact Debra L. Beene at 512/463-5865.**

Sincerely,

for
F. Lawerence Oaks, State Historic Preservation Officer

FLO/dlb

TEXAS WATER DEVELOPMENT BOARD

E. G. Rod Pittman, *Chairman*
William W. Meadows, *Member*
Dario Vidal Guerra, Jr., *Member*

J. Kevin Ward
Executive Administrator

Jack Hunt, *Vice Chairman*
Thomas Weir Labatt III, *Member*
James E. Herring, *Member*

January 7, 2008

Rob R. Reid
Vice President/Principal Project Director
PBS&J
6504 Bridge Point Parkway, Suite 200
Austin, TX 78730

Re: PBS&J Job No. 441988.00

Dear Mr. Reid:

Please note that the scope of this request goes beyond our current program responsibilities. Please feel free to call me at (512) 936-0813 if you have any questions.

Sincerely,

William F. Mullican, III
Deputy Executive Administrator
Planning

TEXAS
PARKS &
WILDLIFE

COMMISSIONERS

JOSEPH B.C. FITZSIMONS
CHAIRMAN
SAN ANTONIO

DONATO D. RAMOS
VICE-CHAIRMAN
LAREDO

MARK E. BIVINS
AMARILLO

J. ROBERT BROWN
EL PASO

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HOUSTON

NED S. HOLMES
HOUSTON

PETER M. HOLT
SAN ANTONIO

PHILIP MONTGOMERY
DALLAS

JOHN D. PARKER
LUFKIN

LEE M. BASS
CHAIRMAN-EMERITUS
FORT WORTH

ROBERT L. COOK
EXECUTIVE DIRECTOR

February 25, 2008

Mr. Rob Reid
PBS&J
6504 Bridge Point Parkway, Suite 200
Austin, Texas 78730

RE: Proposed construction of a 138-kilovolt transmission line, Polk County.

Dear Mr. Reid:

Texas Parks and Wildlife Department (TPWD) received your request regarding an environmental review of the proposed project. Department staff reviewed the information provided for possible impacts to fish and wildlife resources of the state.

PBS&J and the East Texas Electric Cooperative, Inc. (ETEC) are proposing to construct approximately 3-4 miles of new 138-kilovolt (kV) transmission line, Polk County. The proposed project would be connect ETEC's proposed substation, to be located immediately south of the Lake Livingston Dam and adjacent to the proposed Lake Livingston Hydroelectric Generation Plant on the southeast shore of Lake Livingston, to ETEC's existing Rich Substation, located approximately 1.5 mile northwest of Goodrich in Polk County. The transmission line will be constructed on single-poles within an approximately 100-foot wide right-of-way.

Project Information

Due to the lack of information regarding the fish and wildlife impacts of the proposed project, it is not possible to adequately assess the potential impacts of this project upon fish and wildlife resources.

Recommendations: In general, an inventory of existing natural resources should be made of the project area. Specific evaluations should be designed to predict project impacts upon these natural resources. Sufficient documentation should be supplied to accurately interpret the value of the natural resources involved and the extent to which the project will impact these resources.

ENJOY THE TEXAS OUTDOORS!

Take a kid hunting or fishing

• ● •

Visit a state park or historic site

4200 SMITH SCHOOL ROAD
AUSTIN, TEXAS 78744-3291
512.389.4800

www.tpwd.state.tx.us

- This can often be accomplished best with aerial and ground photography, terrain maps, charts and tables, and narrative descriptions of these data.

More detailed information outlining the requirements and expectations of this Department concerning environmental assessments are attached in a document entitled, "***Texas Parks and Wildlife Suggested Guidelines for Preparation of Environmental Assessment Documents.***"

Vegetation Impacts

The project description does not include a summary of potentially impacted vegetation.

> **Recommendations:** TPWD recommends that clearing of mature, native trees along the route be avoided. Loss of vegetation should be minimized by using site planning and construction techniques designed to avoid and preserve existing trees, shrubs, grasses, and forbs. *For impacts that are unavoidable, TPWD recommends transplanting the existing trees or replacing them at a ratio of 3 saplings for every tree lost.* Whether transplanted or replaced, a survival of 85% should be achieved. TPWD recommends that native plant and forage species that are beneficial to wildlife endemic to the area be used in mitigation and landscaped areas.

Rare Resources

According to records in the Texas Natural Diversity Database (TXNDD), occurrences of the following species have been documented possibly within the proposed project area:

State Listed Threatened
Bald Eagle (*Haliaeetus leucocephalus*)

Species of Concern
Southeastern Myotis Bat (*Myotis austroriparius*)

Natural Communities and Special Features
Loblolly Pine-White Oak-Southern Red Oak Series (*Pinus taeda- Quercus alba-Quercus falcate Series*)
Rookery

The TXNDD is intended to assist users in avoiding harm to rare species or significant ecological features. Absence of information in an area does not imply that a species is absent from that area. Given the small proportion of public versus private land in Texas, the TXNDD does not include a representative inventory of rare resources in the state. Although it is based on the best data available to TPWD regarding rare species, ***the data from the TXNDD do not provide a definitive statement as to the presences, absence or condition of special species, natural communities, or other significant features within your project area.*** These data are not inclusive and **cannot be used as presence/absence data**. They represent species that could potentially be in your project area. This information cannot be substituted for on-the-ground surveys.

The TXNDD is updated continuously. As your project progresses and for future projects, please contact Dorinda Scott at (512) 912-7023 or Dorinda.Scott@tpwd.state.tx.us for the most current and accurate information.

> **Recommendations:** The U.S. Fish and Wildlife Service (FWS) should be contacted for additional species occurrence data, guidance, permitting, survey protocols, and mitigation for federally listed species. Please review the most current TPWD county list, as rare species could be present depending upon habitat availability. These lists are now available on-line at http://www.tpwd.state.tx.us/landwater/land/maps/gis/ris/endangered_species.phtml. If during construction, the project area is found to contain rare species, natural plant communities, or special features, TPWD recommends that precautions be taken to avoid impacts to them.

Water Resources

The Clean Water Act (CWA) sets the basic regulatory framework for regulating discharges of pollutants to U.S. waters. Section 404 of the CWA establishes a federal program to regulate the discharge of dredge and fill material into waters of the U.S., including wetlands. The U.S. Army Corps of Engineers (COE) and the Environmental Protection Agency (EPA) are primarily responsible for making jurisdictional determinations and regulating wetlands under Section 404 of the CWA. The COE also makes jurisdictional determinations under Section 10 of the Rivers and Harbors Act of 1899.

Recommendations: If the proposed construction would impact aquatic resources then the project sponsor should contact the U.S. Army Corp of Engineers for determination of jurisdictional wetlands and for permitting requirements. Compensation may be required for any encroachment into these areas.

Migratory Birds

America's bird population has declined by over half since the 1960's. Many of these migratory species rely on riparian corridors as feeding, breeding and nesting areas. The Migratory Bird Treaty Act (MBTA) provides for a year round closed season for non-game birds and prohibits the taking of migratory bird nests and eggs, except as permitted by the FWS.

Recommendations: In order to protect migratory birds construction activities should occur outside the March – August migratory bird nesting season of each year the project is authorized and lasting for the life of the project. Construction activities include (but are not limited to) removal of nests or nest structures, tree felling as well as vegetation clearing, trampling, or maintenance.

Please contact the FWS Southwest Regional Office (Region 2) at (505) 248-6879 for further information.

Revegetation

Recommendations: TPWD recommends that East Texas Electric Cooperative, Inc. reseed disturbed soils with a mixture of grasses and forbs native to Polk County. To enhance native grasses available to wildlife in the project area, TPWD recommends that Bermuda grass be avoided to the extent possible in reseeding efforts, though TPWD understands that slopes may require certain grasses to control erosion.

For assistance in determining the best native seed mix for the project area, please contact our staff. Runoff control measures should be maintained until native plants have been reestablished on disturbed areas.

I appreciate the opportunity to provide preliminary input on potential impacts related to this project. Because the proposed route alternatives have not yet been identified, TPWD cannot provide specific comments on potential impacts to

threatened and endangered species or general fish and wildlife resources. Please provide a copy of the Environmental Assessment (EA) to TPWD for review and comment prior to application to the Public Utilities Commission for a Certificate of Convenience and Necessity.

TPWD strives to respond to requests for project review within the 45 day comment period. Responses may be delayed due to workload and lack of staff. Failure to meet the 45 day review timeframe does not constitute a concurrence from TPWD that the proposed project will not adversely impact fish and wildlife resources.

TPWD advises review and implementation of these recommendations. If you have any questions, please contact me at (361) 576-0022.

Sincerely,

Amy Hanna

Amy Hanna
Wildlife Habitat Assessment Program
Wildlife Division

/ajh:12896

Attachment

cc: T.Brian Almon,
Public Utility Commission of Texas
1701 N. Congress
P.O. Box 13326
Austin, TX 78711-3326

Buddy Garcia, *Chairman*
Larry R. Soward, *Commissioner*
Bryan W. Shaw, Ph.D., *Commissioner*
Glenn Shankle, *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

April 2, 2008

Mr. Rob R. Reid
Vice President/ Principal Director
PBS&J
6504 Bridge Point Parkway, Suite 200
Austin, TX 78730

Re: TCEQ Grant and Texas Review and Comment System (TRACS) #8820, East Texas Electric Cooperative, Inc., Polk County, PBS&J Job No. 441988.00

Dear Mr. Reid:

The Texas Commission on Environmental Quality (TCEQ) has reviewed the above-referenced project and offers following comments:

A review of the project for General Conformity impact in accordance with 40 CFR Part 93 and Title 30, Texas Administrative Code § 101.30 indicates that the proposed action is located in Polk County, which is currently unclassified or in attainment of the National Ambient Air Quality Standards for all six criteria air pollutants. Therefore, general conformity does not apply.

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. Any minimal dust and particulate emissions should be easily controlled by the construction contractors using standard dust mitigation techniques.

We recommend the environmental assessment address actions that will be taken to prevent surface and groundwater contamination.

Thank you for the opportunity to review this project. If you have any questions, please call Ms. Betty Thompson at (512) 239-1627.

Sincerely,

Thomas W. Weber

Thomas W. Weber, Manager
Water Programs, Chief Engineer's Office

printed on recycled paper using vegetable-based ink

1/16/08

PBS&J

An employee-owned company

December 20, 2007

Ms. Chris Turk
Planning and Environmental Quality
Nation Park Service; Intermountain Support Office
P.O. Box 25287
Denver, CO 80225-0287

Dear Ms. Turk: PBS&J Job No. 441988.00

East Texas Electric Cooperative, Inc. (ETEC) is proposing to construct a new 138-kilovolt (kV) transmission line in Polk County, Texas. The proposed line will connect ETEC's proposed substation, to be located immediately south of Lake Livingston Dam and adjacent to the proposed Lake Livingston Hydroelectric Generation Plant on the southeast shore of Lake Livingston, to ETEC's existing Rich Substation, located approximately 1.5 miles northwest of Goodrich in Polk County. The transmission line will be approximately 3-4 miles long, and constructed primarily on single poles within a 100-foot (ft) wide right-of-way (ROW). The study area is shown in the attached figure.

PBS&J is preparing an Environmental Assessment and Alternate Route Analysis for the proposed project that will support ETEC's application for a Certificate of Convenience and Necessity (CCN) from the Public Utility Commission of Texas (PUC). The environmental study will also be used to support ETEC's application to the Federal Energy Regulatory Commission for a license to construct and operate a hydroelectric generating plant at Lake Livingston dam. PBS&J is currently in the process of collecting and evaluating environmental data for the study area. As part of this effort, we are requesting that your agency/office relate any environmental or land use concerns that you may have regarding the potential environmental effects from the construction of these facilities within the designated study area. PBS&J would appreciate receiving your comments regarding the natural, cultural, or human resources within the vicinity of this project that are of concern to your agency/office.

Your comments will be an important consideration in both the selection and evaluation of alternative routes, as well as in the assessment of impacts. In addition, should you identify any area requiring permits, easements, or other approvals by your agency/office, or if you are aware of any major proposed development or construction in the study area, we would also appreciate receiving this information. If you have any questions concerning this project or our request for information, please call Mr. Derek Green or me at (512) 327-6840. Your earliest reply will be appreciated.

Sincerely,

Rob R. Reid

Rob R. Reid
Vice President/Principal Project Director

The National Park Service reviewed this project, and determined that no parks will be affected; therefore, we have no comments.

Signed: Date: 1/2/08

cc: Edd Hargett, ETEC
George Kithas, Cornelius-Pierce Consulting Engineers, Inc.
Dan Wittliff, GDS
Derek Green, PBS&J

United States Department of Agriculture
NRCS
Natural Resources Conservation Service

101 S. Main Street
Temple, TX 76501-6624
Phone: 254-742-9960
FAX: 254-742-9859

January 7, 2008

PBS&J
6504 Bridge Point Parkway
Suite 200
Austin, Texas 78730

Attention: Rob Reid, Vice President/ Project Director

Subject: LNU-Farmland Protection-Hydro Generation and
East Texas Electric Cooperative 138-kV Transmission Lines
Polk County, Texas

We have reviewed the information provided concerning the proposed East Texas Electric Cooperative 138-kV Transmission lines and Hydro Generation Plant in Polk County, Texas as outlined in your letter of December 20, 2007. This is part of NEPA evaluation for Public Utilities Commission of Texas. We have evaluated the proposed area as required by the Farmland Protection Policy Act (FPPA).

The power line may contain soils classified as Important Farmland; however we do not normally consider power lines a conversion of "Farmland" because the soil can still be used after construction. The Hydro Generation Plant will be located below the Dam on soil that is not classified as Prime Farmland. We have completed an AD-1006 form indicating the exemption. We urge you to use accepted erosion control methods during construction.

I have attached an AD-1006 (Farmland Conversion Impact Rating) form for this transmission line and Hydro Plant indicating the approval status. Thanks for the resource materials you submitted to evaluate this project. If you have any questions please call James Greenwade at (254)-742-9960, Fax (254)-742-9859.

Thanks,

James M. Greenwade
Soil Scientist
Soil Survey Section
USDA-NRCS, Temple, Texas

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request 12-20-2007	
Name of Project East Texas Electric Cooperative 138 kV line	Federal Agency Involved PUC	
Proposed Land Use Electric power transmission	County and State Polk County, Texas	
PART II *(To be completed by NRCS)*	Date Request Received By NRCS 1-7-2008	Person Completing Form: James Greenwade

Does the site contain Prime, Unique, Statewide or Local Important Farmland? *(If no, the FPPA does not apply - do not complete additional parts of this form)*	YES ☐ NO x☐	Acres Irrigated	Average Farm Size
Major Crop(s)	Farmable Land in Govt. Jurisdiction Acres: %	Amount of Farmland As Defined in FPPA Acres: %	
Name of Land Evaluation System Used LESA	Name of State or Local Site Assessment System NONE	Date Land Evaluation Returned by NRCS	

PART III *(To be completed by Federal Agency)*	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly				
B. Total Acres To Be Converted Indirectly				
C. Total Acres In Site				
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland				
B. Total Acres Statewide Important or Local Important Farmland				
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value				
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)				

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)*	**Maximum Points**	Site A	Site B	Site C	Site D
1. Area In Non-urban Use	(15)				
2. Perimeter In Non-urban Use	(10)				
3. Percent Of Site Being Farmed	(20)				
4. Protection Provided By State and Local Government	(20)				
5. Distance From Urban Built-up Area	(15)				
6. Distance To Urban Support Services	(15)				
7. Size Of Present Farm Unit Compared To Average	(10)				
8. Creation Of Non-farmable Farmland	(10)				
9. Availability Of Farm Support Services	(5)				
10. On-Farm Investments	(20)				
11. Effects Of Conversion On Farm Support Services	(10)				
12. Compatibility With Existing Agricultural Use	(10)				
TOTAL SITE ASSESSMENT POINTS	160				
PART VII ***(To be completed by Federal Agency)***					
Relative Value Of Farmland *(From Part V)*	100				
Total Site Assessment *(From Part VI above or local site assessment)*	160				
TOTAL POINTS ***(Total of above 2 lines)***	260				

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? YES ☐ NO ☐

Reason For Selection:

Name of Federal agency representative completing this form:	Date:

U.S. Department of Homeland Security
FEMA Region 6
800 North Loop 288
Denton, TX 76209-3698

FEMA

Region VI
Federal Insurance and Mitigation Administration

Public Notice Review

Re: PBS&J Job No. 441988.00
Polk County, TX

- ☐ We offer the following comments:

Please contact the Polk County Floodplain Administrator (936-327-6826) for a determination as to whether a Floodplain Development Permit is needed.

Reviewer

1·8·08
Date

If further information is required, please write to the address above or call (940) 898-5463.

PBS&J

An employee-owned company

December 20, 2007

Ms. Kyle M. Mills
Region VI Environmental Officer
Federal Emergency Management Agency
Federal Center, 800 N. Loop 288
Denton, TX 76209-3698

Dear Ms. Mills: PBS&J Job No. 441988.00

East Texas Electric Cooperative, Inc. (ETEC) is proposing to construct a new 138-kilovolt (kV) transmission line in Polk County, Texas. The proposed line will connect ETEC's proposed substation, to be located immediately south of Lake Livingston Dam and adjacent to the proposed Lake Livingston Hydroelectric Generation Plant on the southeast shore of Lake Livingston, to ETEC's existing Rich Substation, located approximately 1.5 miles northwest of Goodrich in Polk County. The transmission line will be approximately 3-4 miles long, and constructed primarily on single poles within a 100-foot (ft) wide right-of-way (ROW). The study area is shown in the attached figure.

PBS&J is preparing an Environmental Assessment and Alternate Route Analysis for the proposed project that will support ETEC's application for a Certificate of Convenience and Necessity (CCN) from the Public Utility Commission of Texas (PUC). The environmental study will also be used to support ETEC's application to the Federal Energy Regulatory Commission for a license to construct and operate a hydroelectric generating plant at Lake Livingston dam. PBS&J is currently in the process of collecting and evaluating environmental data for the study area. As part of this effort, we are requesting that your agency/office relate any environmental or land use concerns that you may have regarding the potential environmental effects from the construction of these facilities within the designated study area. PBS&J would appreciate receiving your comments regarding the natural, cultural, or human resources within the vicinity of this project that are of concern to your agency/office.

Your comments will be an important consideration in both the selection and evaluation of alternative routes, as well as in the assessment of impacts. In addition, should you identify any area requiring permits, easements, or other approvals by your agency/office, or if you are aware of any major proposed development or construction in the study area, we would also appreciate receiving this information. If you have any questions concerning this project or our request for information, please call Mr. Derek Green or me at (512) 327-6840. Your earliest reply will be appreciated.

Sincerely,

Rob R. Reid

Rob R. Reid
Vice President/Principal Project Director

cc: Edd Hargett, ETEC
George Kithas, Cornelius-Pierce Consulting Engineers, Inc.
Dan Wittliff, GDS
Derek Green, PBS&J

6504 Bridge Point Parkway • Suite 200 • Austin, Texas 78730 • Telephone: 512.327.6840 • Fax: 512.327.2453 • www.pbsj.com

Rel 2007

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
P.O. Box 26567 (MC-9)
Albuquerque, New Mexico 87125-6567

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:

January 8, 2008

Via Facsimile

Rob R. Reid
PBS&J
6504 Bridge Point Parkway, Suite 200
Austin, TX 78730

Dear Mr. Reid:

This is in response to your letter of December 20, 2007, regarding the proposed construction of a new 138-kilovolt transmission line in Polk County, Texas. The U.S. Department of the Interior (DOI) does not, normally, provide at the Departmental level a coordinated review or comments during preliminary planning for environmental analysis of proposed projects or for environmental assessments. If issues proceed to a level requiring an Environmental Impact Statement to satisfy the requirements of the National Environmental Policy Act, the DOI routinely reviews and provides coordinated comments on those documents. In that regard, we would ask you to please forward the appropriate drafts to the DOI at the following address:

U.S. Department of the Interior
Office of the Secretary
Office of Environmental Policy & Compliance
1849 C Street, N.W. PEP (MS2342)
Washington, DC 20240

Since in this instance that is not the case, we recommend that you consult directly with the following DOI Bureaus regarding this proposal and during the development of the proposed project in order that they may provide you assistance from their areas of jurisdiction and/or special expertise.

Regional Director
Bureau of Indian Affairs
PO Box 368
Anadarko, OK 73005

Regional Director (ES)
U.S. Fish & Wildlife Service
P.O. Box 1306
Albuquerque, NM 87103

Regional Director
Intermountain Region
National Park Service
P.O. Box 25287
Denver, CO 80225

Field Office Supervisor (ES)
U.S. Fish & Wildlife Service
17629 El Camino Real, Suite 211
Houston, TX 77058

We trust the above information will be of assistance as you continue with your proposed project. If you have any other questions in this matter or need additional information, please feel free to contact us at the above address or phone (505) 563-3572.

Sincerely,

Stephen R. Spencer
Regional Environmental Officer

ACKNOWLEDGEMENT

This Is To Acknowledge Receipt of Your Request.

DATE: 11 February 2008

To: **PBS&J**
ATTN: DEREK GREEN
6504 BRIDGE POINT PARKWAY
SUITE 200
AUSTIN, TX 78730

Date Request Received:	**January 3, 2008**
Applicant (If Other Than Requestor)**:**	**East Texas Electric Cooperative, Inc.**
Request For:	**Jurisdictional Determination**
Site Location:	**Located south of Lake Livingston Dam and adjacent to the proposed Lake Livingston Hydroelectric Generation Plant**
Project Manager Assigned:	**Ms. Andria Davis**
Telephone Number:	**(409) 766-6389**
Application File Number:	**SWG-2008-0042**

Please reference the above file number in future matters dealing with your request. Due to recent changes in Federal Regulations, decreased manpower, and an increase in development along the Texas Coast, our current response time for completion of action is at a minimum of 60-90 days. You may contact your project manager at the telephone number listed above or by mail at:

Andria Davis
CESWG-PE-RC
U.S. Army Corps of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Division of Ecological Services
17629 El Camino Real #211
Houston, Texas 77058-3051

February 2007

This responds to your request for threatened and endangered species information in the Clear Lake Ecological Services Field Office's area of responsibility. According to Section 7(a)(2) of the Endangered Species Act and the implementing regulations, it is the responsibility of each federal agency to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any federally listed species. Therefore, we are providing information to assist you in meeting your obligations under the Endangered Species Act.

A county by county listing of federally listed threatened and endangered species that occur within this office's work area can be found at http://www.fws.gov/southwest/es/EndangeredSpecies/lists/ListSpecies.cfm. You should use the county by county listing and other current species information to determine whether suitable habitat for a listed species is present at your project site. If suitable habitat is present, a qualified individual should conduct surveys to determine whether a listed species is present.

After completing a habitat evaluation and/or any necessary surveys, you should evaluate the project for potential effects to listed species and make one of the following determinations:

No effect – the proposed action will not affect federally listed species or critical habitat (i.e., suitable habitat for the species occurring in the project county is not present in or adjacent to the action area). No coordination or contact with the Service is necessary. However, if the project changes or additional information on the distribution of listed or proposed species becomes available, the project should be reanalyzed for effects not previously considered.

Is not likely to adversely affect – the project may affect listed species and/or critical habitat; however, the effects are expected to be discountable, insignificant, or completely beneficial. Certain avoidance and minimization measures may need to be implemented in order to reach this level of effects. You should seek written concurrence from the Service that adverse effects have been eliminated. Be sure to include all of the information and documentation you used to reach your decision with your request for concurrence. The Service must have this documentation before issuing a concurrence.

Is likely to adversely affect – adverse effects to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial. If the overall effect of the proposed action is beneficial to the listed species but also is likely to cause some adverse effects to individuals of that species, then the proposed action "is likely to adversely affect" the listed species. An "is likely to adversely affect" determination requires formal Section 7 consultation with this office.

Regardless of your determination, the Service recommends that you maintain a complete record of the evaluation, including steps leading to the determination of affect, the qualified personnel conducting the evaluation, habitat conditions, site photographs, and any other related articles.

TAKE PRIDE IN AMERICA

PBS&J

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RECEIVED
JAN - 7 2008
CLEAR LAKE ES
HOUSTON, TEXAS

December 20, 2007

Mr. Steve Parris
Field Supervisor, Clear Lake Field Office
U.S. Fish and Wildlife Service
17629 El Camino Real #211
Houston TX 77058-3051

Dear Mr. Parris: PBS&J Job No. 441988.00

East Texas Electric Cooperative, Inc. (ETEC) is proposing to construct a new 138-kilovolt (kV) transmission line in Polk County, Texas. The proposed line will connect ETEC's proposed substation, to be located immediately south of Lake Livingston Dam and adjacent to the proposed Lake Livingston Hydroelectric Generation Plant on the southeast shore of Lake Livingston, to ETEC's existing Rich Substation, located approximately 1.5 miles northwest of Goodrich in Polk County. The transmission line will be approximately 3-4 miles long, and constructed primarily on single poles within a 100-foot (ft) wide right-of-way (ROW). The study area is shown in the attached figure.

PBS&J is preparing an Environmental Assessment and Alternate Route Analysis for the proposed project that will support ETEC's application for a Certificate of Convenience and Necessity (CCN) from the Public Utility Commission of Texas (PUC). The environmental study will also be used to support ETEC's application to the Federal Energy Regulatory Commission for a license to construct and operate a hydroelectric generating plant at Lake Livingston dam. PBS&J is currently in the process of collecting and evaluating environmental data for the study area. As part of this effort, we are requesting that your agency/office relate any environmental or land use concerns that you may have regarding the potential environmental effects from the construction of these facilities within the designated study area. PBS&J would appreciate receiving your comments regarding the natural, cultural, or human resources within the vicinity of this project that are of concern to your agency/office.

Your comments will be an important consideration in both the selection and evaluation of alternative routes, as well as in the assessment of impacts. In addition, should you identify any area requiring permits, easements, or other approvals by your agency/office, or if you are aware of any major proposed development or construction in the study area, we would also appreciate receiving this information. If you have any questions concerning this project or our request for information, please call Mr. Derek Green or me at (512) 327-6840. Your earliest reply will be appreciated.

Sincerely,

Rob R. Reid

Rob R. Reid
Vice President/Principal Project Director

cc: Edd Hargett, ETEC
George Kithas, Cornelius-Pierce Consulting Engineers, Inc.
Dan Wittliff, GDS
Derek Green, PBS&J

UNITED STATES DEPARTMENT OF THE INTERIOR

BUREAU OF INDIAN AFFAIRS
SOUTHERN PLAINS REGION
P.O. BOX 368
ANADARKO, OKLAHOMA 73005

IN REPLY REFER TO:
NATURAL RESOURCES
(405) 247-6673

MAR 20 2008

Rob R. Reid
Vice President / Principal Project Director
PBS&J
6504 Bridge Point Parkway
Austin, TX 78730

Dear Mr. Reid:

Thank you for the opportunity to comment on the East Texas Electric Cooperative, Inc., proposed 138-Kilovolt transmission line. From your description the proposed transmission line will be located at various locations in the vicinity of the Goodrich, Polk County, Texas.

A review of maps of the project location indicates that there are no tribal or Individual Indian trust lands within the project area. The Bureau of Indian Affairs has no jurisdiction within the project area and there are no concerns that the proposed project will impact Indian trust lands within the Southern Plains Region jurisdiction. It is recommended that you contact the Alabama-Coushatta Nation of Texas and the Caddo Nation of Oklahoma as they have historic ties to the area and should be consulted to determine if they have some concern that the project has a potential to impact sites of importance in their respective histories or cultural traditions.

If any additional information is required, please contact John A. Worthington, Regional Archeologist, at 405.247.1565.

Sincerely,

Regional Director

Appendix B

Public Involvement Information

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

East Texas Electric Cooperative, Inc Project No. 12632-000

NOTICE OF INTENT TO FILE LICENSE APPLICATION, FILING OF PRE-APPLICATION DOCUMENT, AND APPROVING USE OF THE ALTERNATIVE LICENSING PROCEDURES

(February 19, 2008)

a. Type of Filing: Notice of Intent to File License Application and Request to Use the Alternative Licensing Procedures.

b. Project No.: 12632-000

c. Dated Filed: December 21, 2007

d. Submitted By: East Texas Electric Cooperative, Inc. (Cooperative)

e. Name of Project: Lake Livingston Hydroelectric Project

f. Location: On the Trinity River, in San Jacinto, Polk, Trinity, and Walker Counties, Texas. No federal lands are occupied by the project works or located within the project boundary.

g. Filed Pursuant to: 18 CFR 5.3 of the Commission's regulations

h. Potential Applicant Contact: Edd Hargett, East Texas Electric Cooperative, Inc., 2905 Westward Drive, P.O. Box 631623, Nacogdoches, TX 75963; (936) 560-9532; e-mail – eddh@gtpower.com.

i. FERC Contact: Sarah Florentino at (202) 502-6863; or e-mail at sarah.florentino@ferc.gov.

j. The Cooperative filed its request to use the Alternative Licensing Procedures on December 21, 2007. The Cooperative provided public notice of its request on December 21, 2007. In a letter dated February 19, 2008, the Director of the Office of Energy Projects approved the Cooperative's request to use the Alternative Licensing Process.

k. With this notice, we are initiating informal consultation with: (a) the U.S. Fish and Wildlife Service and/or NOAA Fisheries under section 7 of the Endangered

Species Act and the joint agency regulations thereunder at 50 CFR, Part 402; (b) NOAA Fisheries under section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations at 50 CFR 600.920; and (c) the Texas State Historic Preservation Officer, as required by section 106, National Historical Preservation Act, and the implementing regulations of the Advisory Council on Historic Preservation at 36 CFR 800.2.

l. With this notice, we are designating the Cooperative as the Commission's non-federal representative for carrying out informal consultation, pursuant to section 106 of the National Historic Preservation Act.

m. The Cooperative filed a Pre-Application Document (PAD; including a proposed process plan and schedule) with the Commission, pursuant to 18 CFR 5.6 of the Commission's regulations.

n. A copy of the PAD is available for review at the Commission in the Public Reference Room or may be viewed on the Commission's website (http://www.ferc.gov), using the "eLibrary" link. Enter the docket number, excluding the last three digits in the docket number field to access the document. For assistance, contact FERC Online Support at FERCONlineSupport@ferc.gov or toll free at 1-866-208-3676, of for TTY, (202) 502-8659. A copy is also available for inspection and reproduction at the following address: Sam Houston Electric Cooperative, 1157 East Church Street, Livingston, Texas 77351; (936) 327-5711.

o. Register online at http://ferc.gov/esubscribenow.htm to be notified via e-mail of new filing and issuances related to this or other pending projects. For assistance, contact FERC Online Support.

Nathaniel J. Davis, Sr.,
Deputy Secretary

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

East Texas Electric Cooperative, Inc. Project No. 12632-000

NOTICE OF SCOPING MEETING AND SOLICITING SCOPING COMMENTS FOR AN APPLICANT PREPARED ENVIRONMENTAL ASSESSMENT USING THE ALTERNATIVE LICENSING PROCESS
(February 28, 2008)

a. Type of Application: Alternative Licensing Process

b. Project No.: 12632-000

c. Applicant: East Texas Electric Cooperative, Inc. (Cooperative)

d. Name of Project: Lake Livingston Hydroelectric Project

e. Location: At the Lake Livingston dam, on the Trinity River, in San Jacinto, Polk, Trinity, and Walker Counties, Texas. No federal lands would be affected.

f. Filed Pursuant to: Federal Power Act, 16 USC §§791(a) - 825(r).

g. Potential Applicant Contact: Edd Hargett, East Texas Electric Cooperative, Inc., 2905 Westward Drive, P.O. Box 631623, Nacogdoches, TX 75963; (936) 560-9532; e-mail – eddh@gtpower.com.

h. FERC Contact: Sarah Florentino, at (202) 502-6863 or sarah.florentino@ferc.gov.

j. Deadline for filing scoping comments: April 25, 2008.

All documents (original and eight copies) should be filed with: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 888 First Street, NE, Washington, DC 20426.

The Commission's Rules of Practice and Procedure require all intervenors filing documents with the Commission to serve a copy of that document on each person on the official service list for the project. Further, if an intervenor files comments or documents with the Commission relating to the merits of an issue that may affect the responsibilities of a particular resource agency, they must also serve a copy of the document on that resource agency.

Scoping comments may be filed electronically via the Internet in lieu of paper. The Commission strongly encourages electronic filings. See 18 CFR 385.2001(a)(1)(iii) and the instructions on the Commission's web site (http://www.ferc.gov) under the "e-Filing" link.

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l. Scoping Process

The Cooperative will use the Commission's alternative licensing process (ALP). Under the ALP, the Cooperative will prepare an Applicant Prepared Environmental Assessment (APEA) and license application for the Lake Livingston Hydroelectric Project.

The Cooperative expects to file with the Commission, the APEA and the license application for the Lake Livingston Hydroelectric Project by March 2009. Although the Cooperative's intent is to prepare an environmental assessment (EA), there is the possibility that an Environmental Impact Statement (EIS) will be required. Nevertheless, this meeting will satisfy the NEPA scoping requirements, irrespective of whether an EA or EIS is issued by the Commission.

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Daytime Meeting	**Evening Meeting**
Wednesday, March 26, 2008 1:30 pm to 3:30 pm Central Standard Time (CST)	Wednesday, March 26, 2008 6:00 pm to 8:00 pm CST
Community Meeting Room, Livingston-Polk County Chamber of Commerce 1001 US Hwy 59 Loop North Livingston, Texas 77351 (936) 327-4929	

To help focus discussions, Scoping Document 1 (SD1), which outlines the subject areas to be addressed in the APEA, was mailed to the individuals and entities on the Commission's mailing list and the Cooperative's distribution list on February 27, 2008. Copies of the SD1 also will be available at the scoping meetings. SD1 is available for review at the Commission in the Public Reference Room, or may be viewed on the Commission's website at http://www.ferc.gov using the "eLibrary" link. Enter the docket number excluding the last three digits in the docket number field to access the document. For assistance, contact FERC Online Support at FERCOnlineSupport@ferc.gov, or toll-free at 1-866-208-3676, or for TTY, (202) 502-8659.

You may also register online at http://www.ferc.gov/docs-filing/esubscription.asp to be notified via email of new filings and issuances related to this or other pending projects. For assistance, contact FERC Online Support.

Based on all written comments received, a Scoping Document 2 (SD2) may be issued. SD2 will include a revised list of issues, as determined by the scoping process.

Meeting Objectives

At the scoping meetings, the staff will: (1) summarize the environmental issues tentatively identified for analysis in the APEA; (2) solicit from the meeting participants all available information, especially quantifiable data, on the resources at issue; (3) encourage statements from experts and the public on issues that should be analyzed in the APEA, including viewpoints in opposition to, or in support of, the staff's preliminary views; (4) determine the resource issues to be addressed in the APEA; and (5) identify those issues that require a detailed analysis, as well as those issues that do not require a detailed analysis.

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Meeting Procedures

The meetings will be recorded by a stenographer and will become part of the formal record of the Commission proceeding on the project.

Site Visit

The Cooperative and Commission staff will conduct a site visit of the project on Wednesday, March 26, 2008, following the afternoon session of the scoping meeting.

The site visit to Lake Livingston dam will take place at TRA's Lake Livingston project headquarters. The physical address of the project is 5170 S. FM 1988, Livingston, Texas, 77351. Access to the dam site is secure, and all individuals wishing to participate

in the site visit must register and provide a copy of a photo identification in advance. If you want to attend the site visit, please notify Brian Lawson, the Cooperative's Project

Manager, and send him a faxed or scanned copy of a photo ID not later than March 19, 2008, using the following contact information:

Brian Lawson, Project Manager
GDS Associates, Inc.
1850 Parkway Place, Suite 800
Marietta, GA 30067
Phone: 770-425-8100
Fax: 770-426-0303
Brian.Lawson@GDSassociates.com

Kimberly D. Bose,
Secretary.

particular, Helios requested that the Commission grant blanket approval under 18 CFR part 34 of all future issuances of securities and assumptions of liability by Helios.

On February 26, 2008, pursuant to delegated authority, the Director, Division of Tariffs and Market Development—West, granted the request for blanket approval under part 34 (Director's Order). The Director's Order also stated that the Commission would publish a separate notice in the **Federal Register** establishing a period of time for the filing of protests. Accordingly, any person desiring to be heard concerning the blanket approvals of issuances of securities or assumptions of liability by Helios, should file a protest with the Federal Energy Regulatory Commission, 888 First Street, NE., Washington, DC 20426, in accordance with Rules 211 and 214 of the Commission's Rules of Practice and Procedure. 18 CFR 385.211, 385.214 (2007). The Commission encourages the electronic submission of protests using the FERC Online link at *http://www.ferc.gov.*

Notice is hereby given that the deadline for filing protests is March 27, 2008.

Absent a request to be heard in opposition to such blanket approvals by the deadline above, Helios is authorized to issue securities and assume obligations or liabilities as a guarantor, indorser, surety, or otherwise in respect of any security of another person; provided that such issuance or assumption is for some lawful object within the corporate purposes of Helios, compatible with the public interest, and is reasonably necessary or appropriate for such purposes.

The Commission reserves the right to require a further showing that neither public nor private interests will be adversely affected by continued approvals of Helios' issuance of securities or assumptions of liability.

Copies of the full text of the Director's Order are available from the Commission's Public Reference Room, 888 First Street, NE., Washington, DC 20426. The Order may also be viewed on the Commission's Web site at *http://www.ferc.gov*, using the eLibrary link. Enter the docket number excluding the last three digits in the docket number filed to access the document. Comments, protests, and interventions may be filed electronically via the Internet in lieu of paper. See 18 CFR 385.2001(a)(1)(iii) and the instructions on the Commission's Web site under the "e-Filing" link. The Commission strongly encourages electronic filings.

Kimberly D. Bose,

Secretary.

[FR Doc. E8–4164 Filed 3–4–08; 8:45 am]

BILLING CODE 6717–01–P

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

[Docket No. CP06–466–000; Docket No. CP06–467–000]

Columbia Gas Transmission Corporation: Somerset Gas Gathering of Pennsylvania, L.L.C.; Notice of Meeting

February 28, 2008.

On March 19, 2008, staff of the Office of Energy Projects (OEP) will hold a meeting on the pending applications in the above referenced dockets. The purpose of the meeting is to discuss various procedural matters and to clarify certain elements of the proposal. Any interested persons may attend.

The meeting will be held on Wednesday, March 19, 2008, at 2 p.m. (EST), in Room 62–22 at the Commission Headquarters in Washington, DC.

Commission meetings are accessible under section 508 of the Rehabilitation Act of 1973. For accessibility accommodations please send an e-mail to *accessibility@ferc.gov* or call toll free 1–(866) 208–3676 (voice). For TTY, call (202) 502–8659 or send a FAX to 202–208–2106 with the required accommodations.

Kimberly D. Bose,

Secretary.

[FR Doc. E8–4225 Filed 3–4–08; 8:45 am]

BILLING CODE 6717–01–P

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

[Project No. 12632–000]

East Texas Electric Cooperative, Inc.; Notice of Scoping Meeting and Soliciting Scoping Comments for an Applicant Prepared Environmental Assessment Using the Alternative Licensing Process

February 28, 2008.

a. *Type of Application:* Alternative Licensing Process.

b. *Project No.:* 12632–000.

c. *Applicant:* East Texas Electric Cooperative, Inc. (Cooperative).

d. *Name of Project:* Lake Livingston Hydroelectric Project.

e. *Location:* At the Lake Livingston dam, on the Trinity River, in San Jacinto, Polk, Trinity, and Walker Counties, Texas. No federal lands would be affected.

f. *Filed Pursuant to:* Federal Power Act, 16 U.S.C. 791(a)–825(r).

g. *Potential Applicant Contact:* Edd Hargett, East Texas Electric Cooperative, Inc., 2905 Westward Drive, P.O. Box 631623, Nacogdoches, TX 75963; (936) 560–9532; e-mail—*eddh@gtpower.com.*

h. *FERC Contact:* Sarah Florentino, at (202) 502–6863 or *sarah.florentino@ferc.gov.*

j. *Deadline for filing scoping comments:* April 25, 2008.

All documents (original and eight copies) should be filed with: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 888 First Street, NE., Washington, DC 20426.

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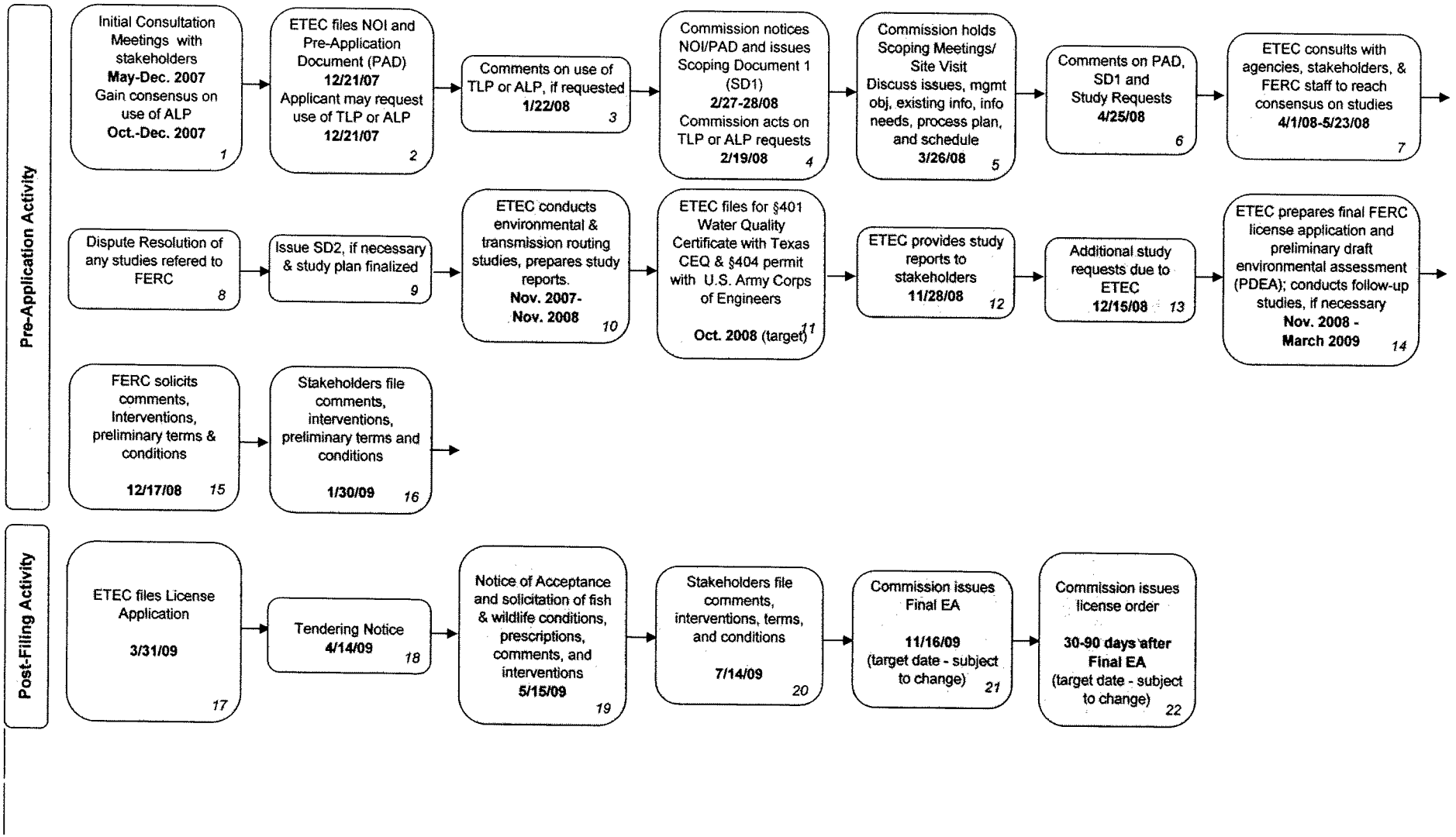
Kimberly D. Bose,

Secretary.

[FR Doc. E8–4223 Filed 3–4–08; 8:45 am]

BILLING CODE 6717–01–P

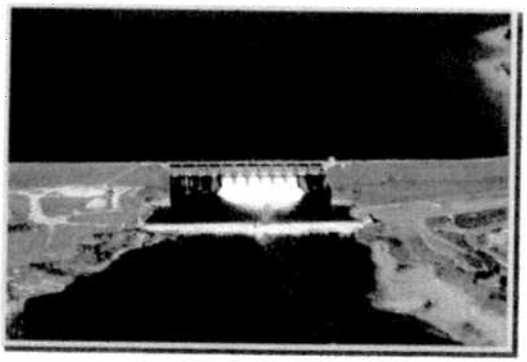
Lake Livingston - ALP flowchart



CLEAN, RENEWABLE ENERGY:

LAKE LIVINGSTON HYDROELECTRIC PROJECT

Livingston, Texas



Project Sponsor: East Texas Electric Cooperative, Inc. (ETEC), in cooperation with the City of Houston and the Trinity River Authority of Texas (TRA).

Lake Livingston: Located near Livingston, Texas and operated by TRA, it is the largest reservoir in Texas dedicated to water supply. Covers 83,000 acres, stores 1,750,000 acre-feet, has 450 miles of shoreline. Houston owns 70% of the storage for municipal water supply.

Project Status: In April 2006, ETEC received a preliminary permit from the Federal Energy Regulatory Commission (FERC) under the Federal Power Act (Project No. 12632), securing priority to develop hydropower at Lake Livingston for a three-year period. In January 2007, ETEC, TRA and Houston reached agreement on a Memorandum of Understanding (MOU) to develop hydropower at Lake Livingston. ETEC submitted the Pre-Application Document (PAD) to FERC in December 2007 and received approval from FERC to use the Alternative Licensing Process (ALP) in February 2008.

Engineering design, environmental studies, and other FERC licensing activities are currently underway. Upon receipt of the FERC license, currently anticipated in late-2009, construction of the project will begin and is expected to be completed by early-2012.

Hydroelectric Project Facts:

- Proposed 24-MW plant will use existing water releases to generate 124,000,000 KWH of clean, renewable electricity annually (this would be enough energy to serve approximately 12,000 households) with little or no environmental impact.
- Project will use existing water releases from the lake to generate hydropower, and will not interfere with Houston's or TRA's current reservoir operations or water rights.
- Hydro project will provide a reliable, competitively priced supply of capacity and renewable energy, enhancing the diversity of ETEC's power supply portfolio.
- Project construction and operation will create jobs for residents of East Texas and will help reduce the region's dependence on fossil energy.
- Energy from hydro project displaces energy from other resources (e.g., coal, gas, etc.) that would otherwise be used to serve load.
- Project will assist the state of Texas in meeting mandated requirements for renewable energy, and will offset approximately 64,000 tons of carbon dioxide emissions from fossil fuel plants on an annual basis.

Detailed Project Description

Location	The proposed project is located at Lake Livingston Dam on the Trinity River in southeastern Texas. The dam is constructed at river mile (RM) 129.2, in San Jacinto and Polk counties, approximately 7 miles southwest of the City of Livingston, Texas. Lake Livingston covers approximately 83,000 acres and occupies portions of San Jacinto, Polk, Trinity and Walker Counties. The power facilities and primary transmission line will be located on the east bank of the river in Polk County.
Operation	Run-of-river. The project will not interfere with existing reservoir operations, nor will it affect the lake levels during operation. The project will simply divert flow discharge that would otherwise be released over the existing spillway.
Head Race Channel	Water for power generation will be directed from Lake Livingston to the intake structure by a headrace channel approximately 800 feet long. The channel will be lined with riprap on the bottom and slopes. The bottom will be approximately 100 feet wide with a slope ratio of 3 H to 1 V.
Intake Structure	The intake structure will be of reinforced concrete located at the downstream end of the headrace channel. It will direct the water for power generation to the penstocks through hydraulically efficient shaped openings each complete with trashracks, closure gates with individual operators, stoplogs, and venting.
Earth Embankment	The earth embankment will form the downstream closure of the headrace channel. It will consist of a basic embankment extending easterly from the east abutment of the existing dam across the penstocks to a point near an existing state highway. The embankment will be approximately 1,000 feet long.
Penstocks	The intake structure will connect directly to three steel penstocks, each approximately 14 feet in diameter and 450 feet in length.
Powerhouse	A powerhouse will be built of reinforced concrete and house three (3) turbine/generator units, a service bay, and all auxiliary mechanical and electrical equipment for station operation.
Turbine & Generator Units	The project will have three (3) new vertical-shaft Kaplan turbines with direct drive synchronous propeller turbines (adjustable blade runners with wicket gates) with direct drive synchronous generators. Each of the units will have a capacity rating of approximately 8 megawatts (MW), for a total installed capacity of 24 MW.
Tailrace Channel	The tailrace will be approximately 2,000 feet long and will extend from the downstream side of the powerhouse to the point where the tailrace merges with the river, approximately 700-800 feet below the dam and 300-400 feet below the tailwater control weir. The tailrace will have a bottom width of 100 feet and the bottom and slopes will be lined with riprap.
Switchyard	An outdoor electric switchyard located to the east of the powerhouse will provide the necessary increase in voltage and electrical protection for the project interconnection to the grid.
Primary Transmission Lines	A single circuit overhead 138-kV transmission line will be required to interconnect the proposed project to the grid. The proposed interconnection will be at an existing substation approximately two-and-a-half (2.5) miles east-southeast of the project site. The project will be interconnected with transmission facilities owned and operated by Entergy.
Access Roads	Several new roads will be constructed to gain access or maintain access to the intake structure, the main dam, the earth embankment, the powerhouse, and other project facilities. A total length of about 2,200 feet of new paved or compacted gravel surface will likely be required.

EAST TEXAS ELECTRIC COOPERATIVE, INC.
LAKE LIVINGSTON HYDRO 138 Kv TRANSMISSION LINE
PROJECT QUESTIONAIRE
MARCH 27, 2008

1. In your opinion, has the need for the project been adequately explained to you?
Yes _____ No _____ (How could we have improved on this effort?)

2. Were the exhibits and explanations of the need for this project helpful to you?
Yes _____ No _____ (If no, please explain)

3. What areas do you believe should be considered of greatest concern in routing the transmission line?

(Please rank each category, 1 – greatest concern and 8 – least concern)

Agricultural Land	1	2	3	4	5	6	7	8
Floodplains or Wetlands	1	2	3	4	5	6	7	8
Recreation or Park Areas	1	2	3	4	5	6	7	8
Residential areas or Subdivisions	1	2	3	4	5	6	7	8
Existing Rights of Way (Roads, pipelines, etc.)	1	2	3	4	5	6	7	8
Historic Sites	1	2	3	4	5	6	7	8
Wildlife	1	2	3	4	5	6	7	8
Others (Please specify)								
_____	1	2	3	4	5	6	7	8
_____	1	2	3	4	5	6	7	8
_____	1	2	3	4	5	6	7	8

4. Are there any other features of the study area you feel are important? If so, please tell us. You may either describe the locations and/or mark it on the study area map attached.

5. What kinds of things do you feel most concerned about that should be addressed in the routing of this line?

6. How did you learn about this Open House?

7. Power companies that serve urban areas typically utilize multiple transmission lines into substation to increase reliability to their consumers. Do you think this is: _____ less important; _____ as important; _____ more important; for the rural areas and consumers?

8. Established procedures for selecting transmission line routes provides for alternate route analysis based upon: Project Economics, Environmental Concerns, and Landowner Concerns. What percentage weight do you believe this route selection should use?

_____% Economics ____% Environmental _____% Landowner Concerns

9. Would you like a follow-up contact to discuss the project in more detail?

   Yes _____ No _____

10. Do you have any general remarks or questions?

NAME _____

ADDRESS _____

CITY _____ ZIP CODE _____

TELEPHONE (HOME) (_____) _____ - _____

(WORK) (_____) _____ - _____

In case you wish to mail this questionnaire, please send it to the following address:

Cornelius-Pierce Consulting Engineers
c/o Aaron Wagner
9020 Benbrook Blvd.
Benbrook, TX 76126

Mailed responses must be received no later than April 8, 2008.

THANK YOU FOR YOUR COMMENTS!