Environmental Assessment and
Alternative Site/Route Analysis for the
Bulverde Substation and Transmission Project
Bexar and Comal Counties, Texas

Document No. 130109
Job No. 100032882

ENVIRONMENTAL ASSESSMENT AND ALTERNATIVE SITE/ROUTE ANALYSIS FOR THE BULVERDE SUBSTATION AND TRANSMISSION PROJECT BEXAR AND COMAL COUNTIES, TEXAS

Prepared for:

CPS Energy
P.O. Box 1771
San Antonio, Texas 78296-1171

Prepared by:

Atkins
6504 Bridge Point Parkway, Suite 200
Austin, Texas 78730

January 2014

Contents

Page

Page

Figures

Tables

Acronyms and Abbreviations

AACOG	Alamo Area Council of Governments
ANSI	American National Standards Institute
AOU	American Ornithologists' Union
APLIC	Avian Power Line Interaction Committee
BEG	Bureau of Economic Geology
BFZ	Balcones Fault Zone
BGEPA	Bald and Golden Eagle Protection Act
BLS	U.S. Bureau of Labor Statistics
CAR	Center for Archeological Research
COSA	City of San Antonio
CWS	Canadian Wildlife Service
EA	Environmental Assessment and Alternative Site/Route Analysis
EARZ	Edwards Aquifer Recharge Zone
EMF	electric and magnetic field
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FM	Farm-to-Market Road
FPPA	Farmland Protection Policy Act
ft	feet/foot
FVZ	foreground visual zone
FWS	U.S. Fish and Wildlife Service
HPA	high probability areas
HTC	Historic Texas Cemetery
I-10	Interstate Highway 10
ISD	Independent School District
kV	kilovolt
MBTA	Migratory Bird Treaty Act
MSA	Metropolitan Statistical Area
NDD	Natural Diversity Database
NESC	National Electric Safety Code
NHL	National Historic Landmark

NHT	National Historic Trail
NOI	Notice of Intent
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
NWR	National Wildlife Refuge
OTHM	Official Texas Historical Marker
PEC	Pedernales Electric Cooperative
PSF	Permanent School Fund
ROW	right-of-way
RTHL	Recorded Texas Historic Landmark
SAAS	San Antonio Audubon Society
SAL	State Antiquities Landmark
SARA	San Antonio River Authority
SAWS	San Antonio Water Systems
SCS	Soil Conservation Service
SH	State Highway
SWPPP	Storm Water Pollution Prevention Plan
TAMU	Texas A&M University
TARL	Texas Archeological Research Laboratory
TCEQ	Texas Commission on Environmental Quality
THC	Texas Historical Commission
TLC	Texas Land Conservancy website
TPWD	Texas Parks and Wildlife Department
TSS	Texas Speleological Society
TWC	Texas Workforce Commission
TxDOT	Texas Department of Transportation
US	U.S. Highway
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
WPA	Works Progress Administration
WPAP	Water Pollution Abatement Plan

1.0 DESCRIPTION OF THE PROPOSED PROJECT

1.1 SCOPE OF PROJECT

CPS Energy is planning to construct a new electric substation in the north central area of San Antonio near U.S. Highway (US) 281 and Farm-to-Market Road (FM) 1863 in Comal or Bexar County. The proposed Bulverde Substation will provide additional electric capacity to support community growth and to improve the reliability of electric services to homes and businesses in that area. The new substation will cover an area of approximately 3 to 5 acres and will be connected to CPS Energy's existing Stonegate to Green Mountain 138-kilovolt (kV) transmission line by a double-circuit transmission line. This double-circuit transmission line will be approximately 4–6 miles long and will occupy a right-of-way (ROW) approximately 100 feet (ft) in width. It is scheduled to be in service by June 2017. Figure 1-1 shows the location of the study area for the project.

CPS Energy has tasked Atkins to prepare an Environmental Assessment and Alternative Site/Route Analysis (EA). This document 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

1.2.1 Capacity

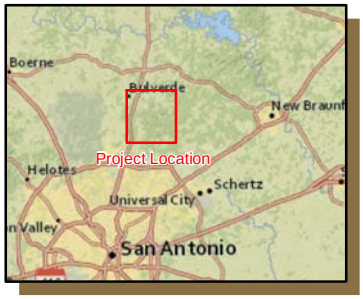
The Bulverde area is established and growing. To support the increasing need for electricity, CPS Energy needs to increase the supply capacity. As a result, substation(s) must be expanded or constructed.

1.2.2 Distribution System

Networks of distribution lines connect substations to businesses and homes. The existing distribution infrastructure is nearing the limit of its capability, so more distribution lines must be built. The length of new lines should be minimized to reduce costs and construction impacts. Furthermore, shorter lines help the continual need to improve reliability and power quality.

1.2.3 Reliability and Power Quality

As a distribution line is extended over a longer distance and as more customers are connected to the line, the reliability and quality of the electric service can decline. The longer the line, the more opportunity for electrical disturbances caused by squirrels, wind, trees, and other factors.



0 0.5 1 Miles

ATKINS

Figure 1-1

STUDY AREA LOCATION
BULVERDE SUBSTATION AND
TRANSMISSION PROJECT

Path: N:\Clients\C_D\CPS_Energy\100032882\geo\figs\Study_Area_Location_map.mxd

Spreading the electric load (customers) among more, shorter distribution lines generally improves the reliability and the quality of power that customers receive. Furthermore, since it will be close to the customers being served, the new substation will improve distribution reliability and power quality in ways that cannot be achieved with the existing substations.

1.3 DESCRIPTION OF PROPOSED CONSTRUCTION

Details of the proposed installation will be determined after a site is selected. A general description is provided below.

1.3.1 Substation Design

The substation will be designed as a three-unit site with one 138/35-kV, 100-MVA transformer and one 4-feeder switchgear. The substation will be looped into the existing Stonegate to Green Mountain 138-kV transmission line, requiring two 138-kV line terminals. The substation will include one 138-kV circuit switcher and a 2000-A main bus design. It will also be configured for future installation of a 138-kV capacitor bank. Figure 1-2 shows an example of a substation, while figures 1-3 and 1-4 show an example of a high-voltage transmission line and a lower-voltage distribution line, respectively.

1.3.2 Construction Schedule

CPS Energy plans to construct the substation and transmission line between August 2016 and June 2017. The schedule will be refined as the site is selected and engineering designs progress. The substation and transmission line will be constructed by a combination of contractor and CPS Energy crews. Normal working hours will be Monday–Friday, 7:00 A.M. to 6:00 P.M., with the possibility of working on Saturdays and Sundays, as needed, to maintain construction schedules.

1.4 AGENCY ACTIONS

If the proposed transmission line is located within, or across, the ROW of any city- or state-maintained road or highway, CPS Energy will obtain the appropriate permit(s) from the controlling governing entity. Since more than 1 acre will be cleared or disturbed during construction, a Storm Water Pollution Prevention Plan (SWPPP) will be prepared and a construction notice will be submitted by CPS Energy to the San Antonio Water Systems (SAWS). The controls specified in each SWPPP will be monitored in the field. Permits or regulatory approvals may also be required from the Texas Commission on Environmental Quality (TCEQ), Texas Historical Commission (THC), U.S. Army Corps of Engineers (USACE), and the U.S. Fish and Wildlife Service (FWS). Following the identification of environmental and ROW concerns, appropriate measures will be taken during engineering to incorporate special provisions in construction documents, specifications, or other

ATKINS

Figure 1-2

TYPICAL SUBSTATION

Source: CPS Energy

File: N:\Clients\C_D\CPS_Energy\100032882\geo\figs \figure1-2.pdf

ATKINS

Figure 1-3

TYPICAL TRANSMISSION LINE

Source: CPS Energy

File: N:\Clients\C_D\CPS_Energy\100032882\geo\figs\figure1-3.pdf

ATKINS

Figure 1-4

TYPICAL DISTRIBUTION LINE

Source: CPS Energy

File: N:\Clients\C_D\CPS_Energy\100032882\geo\figs\figure1-4.pdf

instructions. Following completion of the design, a preconstruction conference will be held, which will include a review of these provisions. Physical inspections of the project will be performed to assure all appropriate measures have been taken during construction.

1.5 DESCRIPTION OF PROPOSED TRANSMISSION LINE DESIGN

1.5.1 Transmission Line Easements

The line will be constructed in easements obtained by CPS Energy and defined by a metes and bounds descriptions prepared by licensed land surveyors after a route is approved. The proposed ROW width will be 100 ft unless the transmission line is located within or adjacent to existing pipeline, road, or transmission/distribution line ROW, in which case it may be less. In rare instances the needed ROW width may be greater than 100 ft. Temporary construction easements or separate access easements may also be required for the facilities.

Generally, the ROW will be unfenced, and landowners will have access to easements located on their land. However, gates or gaps will be installed with locks in fences that cross the ROW and in any fences that restrict CPS Energy personnel from accessing the ROW. ROW will be maintained, as required, to allow access for the construction, operation, and maintenance of the transmission line. For example, culverts may be installed in areas to provide access along the ROW.

1.5.2 Structures

The CPS Energy transmission system consists of several different structure types, which vary due to location, terrain, and specific project requirements. The proposed 138-kV transmission line will be constructed on steel poles, as shown on Figure 1-3. Typical structure heights will range from 80 to 120 ft, and typical span distances between structures will range from 400 to 800 ft, with possible exceptions due to site conditions and/or engineering requirements (e.g., near corners, road crossings, or substations and where longer spans are necessary). Design criteria will meet or exceed the National Electric Safety Code (NESC), American National Standards Institute (ANSI) C2, and CPS Energy standard design specifications.

1.5.3 Design Considerations

To minimize any adverse effects to natural and human resources, where practical, the design and placement of structures may be affected by the results of natural resources and cultural resources assessments and by the availability of topographic features and vegetation to effectively screen structures.

1.6 CONSTRUCTION CONSIDERATIONS

Projects of this type require clearing, structure assembly and erection, conductor and shield wire installation, and cleanup when the project is completed. The following criteria will be taken into

consideration (these criteria are subject to adjustment befitting the rules and judgments of any public agencies whose lands may be crossed by the proposed line):

1. Clearing and grading of construction areas such as storage areas, setup sites, etc. will be minimized to the extent practicable. These areas will be graded in a manner that will minimize erosion and conform to the natural topography.

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 vegetation may be planted.

3. Soil disturbance during construction will be minimized and erosion control devices will be constructed where necessary. The project will comply with TCEQ and the City of San Antonio (COSA) and City of Bulverde requirements for stormwater discharges.

4. Clearing and construction activities in the vicinity of streambeds will be performed in a manner to minimize damage to the natural condition of the area. Where feasible, service and access roads will be constructed jointly. Roads will not be constructed on unstable slopes and, as required, side drainage ditches and culverts will be provided to prevent soil or road erosion. Construction of access roads and drainage structures required for the project will comply with any applicable state or federal permit requirements.

5. Tension stringing of conductors may be employed to reduce the amount of vegetation clearing before final conductor locations are established. Helicopters may be used in otherwise inaccessible areas and to reduce the amount of clearing.

6. When possible, in areas of high wildlife use or in areas of known endangered or threatened species habitat, construction will be performed during seasons of low wildlife occurrence, such as between periods of peak waterfowl migrations (generally spring and fall) and during nonbreeding season (species dependent).

7. If any archeological materials are uncovered during construction, construction will cease in the immediate area of the discovery and the discovery will be evaluated.

1.6.1 Clearing and ROW Preparation

Clearing plans, methods, and practices are extremely important to minimize the potential adverse effects of transmission lines on the environment. The ROW will not be clearcut. Only trees and

vegetation that may interfere with the construction, operation, and maintenance of the transmission line will be removed. Available methods of tree and brush disposal are mulching and salvaging. Landowners' preferences will be considered. The selection of the disposal method will conform with applicable regulations, which often require that cleared brush and trees be stacked and left for wildlife use.

1.6.2 Structure Assembly and Erection

Survey crews will stake or otherwise mark structure locations. Construction crews will install structures by excavating holes and placing a reinforced concrete foundation. After the foundations have cured sufficiently, crews will set the structures and install the conductor and shield wire suspension assemblies. Since a large amount of vehicular traffic will occur during this operation, construction crews will take care to minimize impacts to the ROW by minimizing the number of pathways traveled.

1.6.3 Conductor and Shield Wire Installation

The conductors and shield wires are installed via a tensioning system. A rope is first threaded through the stringing blocks or dollies for each conductor and shield wire. A helicopter may be used for threading the rope through the stringing blocks to help minimize clearing. Conductor and shield wires are then pulled by the ropes and held tight by a tensioner to keep the wires from coming in contact with the ground and other objects that could be damaging to the wire. In addition, guard structures (temporary wood-pole structures) will be installed where the transmission line crosses overhead electric power lines, overhead telephone lines, roadways, or other areas requiring an additional margin of safety during wire installation. 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.

1.6.4 Cleanup

The cleanup operation typically involves the leveling of all disturbed areas, the removal of all debris, and the restoration of any items damaged by construction of the project. Upon the completion of the construction work, the contractor will promptly remove from the site all scrap, trash, excavated materials, waste materials, and debris resulting from construction of the transmission line. All contractor-owned equipment and materials will also be removed from the site, and waste disposal will be conducted in a legal manner.

1.7 MAINTENANCE CONSIDERATIONS

CPS Energy will periodically inspect the substation, transmission line ROW, structures, and line to provide safe and reliable facilities. The major maintenance item will be the removal or trimming of trees that pose a potential danger to the conductors or structures. Preservation of both the

environmental and natural resource conservation factors designed and built into transmission system siting requires a thoughtful, comprehensive program for maintaining the facility. The following factors are incorporated into CPS Energy's program for this project.

1. Native vegetation, particularly that of value to fish and wildlife, which has been saved through the construction process and that does not have the potential to grow close enough to the transmission line that the vegetation poses a hazard to the safe operation and maintenance of the transmission line, will be allowed to grow in selected parts of the ROW. Likewise, if ecologically appropriate, native grass cover and low-growing shrubs will be left in the areas immediately adjacent to transmission structures. Where grading is necessary, access roads will be graded to the proper slope to prevent soil erosion.

2. Once a cover of vegetation has been established, it will be maintained to assure public safety and a reliable, functioning transmission system.

3. If used, U.S. Environmental Protection Agency (EPA)-approved herbicides will be carefully selected to have a minimal effect on desirable indigenous plant life, and selective application will be used whenever appropriate.

4. Maintenance inspection intervals will be established by CPS Energy, and routine maintenance will be encouraged when access roads are firm or dry.

5. Aerial and ground maintenance inspection activities of the transmission line facility will include observation of soil erosion problems, fallen timber, and conditions of the vegetation that require attention. Where necessary, on the basis of erosion control, native shrubs or grasses may be planted.

6. Public acceptance of ROW is generally broadened when compatible multiple use of the ROW is allowed. Transmission line ROW can be made available for appropriate types of multiple-use concepts, such as farming and cattle grazing, as long as the activity does not impact public safety or inhibit the safe operation and maintenance of the electrical system. Landowners should coordinate with the utility if another use of the ROW is being considered.

7. The results of natural resources and cultural resources assessments will be followed as necessary during maintenance of the ROW, unless these assessments create an unsafe condition.

2.0 DEVELOPMENT AND EVALUATION OF ALTERNATIVE SUBSTATION SITE AND TRANSMISSION LINE ROUTES

2.1 OBJECTIVE OF STUDY

The objective of this study was to develop and evaluate several alternative substation sites and transmission line routes, and ultimately to recommend a preferred site and transmission line route for CPS Energy's proposed Bulverde substation and transmission project, which is feasible from economic, engineering, system planning, and environmental standpoints. CPS Energy followed its previously established general procedures and methodology in the siting/routing of substations and transmission lines. CPS Energy utilizes a multiphase approach for completing a project: define the study area; obtain environmental information; map environmental and land use constraints; identify potential substation sites; develop preliminary alternative route segments; conduct public involvement; identify and evaluate primary substation sites and alternative routes; conduct environmental, engineering, and cost analyses; select a preferred site and transmission line route; acquire CPS Energy Board approval; and design and construct the substation and transmission facilities.

2.1 IDENTIFICATION OF POTENTIAL SITES AND DEVELOPMENT OF ALTERNATIVE ROUTES

2.1.1 Study Area Delineation

To locate potential sites for the substation, CPS Energy first identified a study area large enough to capture a number of sites that might satisfy the needs described above. CPS Energy identified potential sites within the study area based on the following criteria:

Size of the site, based on needed capacity. To relieve the growing demand on existing substations and to provide a reliable electric supply in the Bulverde area, approximately 5 acres will be needed to construct the new substation.

Location of the site, based on available electric supply. The existing Stonegate to Green Mountain 138-kV transmission line is the only convenient electric supply that is available to feed the new substation. Thus, the study area has to be large enough to encompass these two endpoints.

Location of the site, based on the distribution system. To create the best mix of more and shorter distribution lines, the new substation should be located near existing distribution lines (while being relatively close to the existing Stonegate to Green Mountain transmission line).

The study area also has to include a large enough area within which a sufficient number of alternative routes could be developed between the potential substation sites and the existing Stonegate to Green Mountain 138-kV transmission line. The study area is approximately 7.1 miles

long by 6.7 miles wide, and encompasses approximately 48 square miles in Comal and Bexar counties (see Figure 1-1).

2.1.2 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 potential substation sites and possible alternative routes. The geographic locations of environmentally sensitive and other restrictive areas within the study area were located and considered during substation siting and transmission line route delineation. These constraints were mapped onto an aerial-photography 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 congested urban areas, subdivisions, individual residences, community facilities, parks/recreation areas, cemeteries, historic sites, archeological sites, wetlands, churches, schools, and endangered or threatened species habitat, and by utilizing or paralleling existing compatible ROW and property lines, where practical.

2.1.3 Potential Substation Sites and Preliminary Alternative Route Segments

Utilizing the information described above, CPS Energy identified four potential substation site locations. Atkins developed preliminary alternative route segments between these four potential sites and the existing Stonegate to Green Mountain 138-kV transmission line. These route segments were refined as more information became available, including the results of field investigations. Community values, existing and proposed land use, and areas of environmental concern were taken into consideration when identifying the potential substation sites and developing the preliminary route segments.

CPS Energy continually reviewed the preliminary route segments throughout their development, taking into consideration the additional factors of engineering/system planning issues, and proposed several revisions by adding, deleting, or modifying individual segments. The resulting preliminary route segment network and four potential substation sites, shown on Figure 2-1, were presented to the public at an open-house meeting in October 2013.

2.1.4 Primary Substation Sites and Alternative Routes

Following the public open-house meeting, CPS Energy and Atkins met at the CPS Energy offices in San Antonio to evaluate public input, the results of the field surveys, and to consider revisions to the network of preliminary route segments as presented at the October 2013 public open-house meeting by subsequently adding, deleting, or modifying some segments. Subsequent to this meeting, questionnaires from the open house were reviewed and analyzed, new information on platted subdivisions was reviewed, and engineering constraints were reviewed. As a result of these

efforts, 18 primary alternative routes were selected for an in-depth environmental evaluation. These 18 primary routes are shown on Figure 2-2 (map pocket). Table 2-1 presents the composition of these 18 routes by segment, as well as their approximate length.

In determining the primary alternative routes selected, two segments (segments **2** and **18**) were eliminated, and five segments (**5**, **6**, **10**, **13**, and **15**) were modified from the preliminary route segment network shown on Figure 2-1 and as presented at the October 2013 public open-house meeting. Furthermore, one potential substation site was also eliminated. Substation **sites C** and **D** were in a similar location; however, **Site C** was preferable to **Site D** because it was farther away from an active quarry. Thus, Substation **Site D** was eliminated. Segment **2** was eliminated because compared to Segment **3**, it would impact more residences. Segment **18** was eliminated because Substation **Site D** was eliminated. Segment **5** was modified because it crossed a platted subdivision; it was moved a little farther to the southwest. Exiting from Substation **Site B**, Segment **6** was moved a little farther south to avoid crossing a new commercial structure. Segment **10** was modified for engineering reasons regarding the crossing of Cibolo Creek, for access reasons south of Cibolo Creek, and for engineering reasons regarding the location of the PI when heading west to cross US 281. Segment **10** now heads west from the junction of segments **8** and **9**, crosses US 281, and ties in with Segment **7** farther north than before. Thus Segment **7** becomes shorter and Segment **11** longer than before. Segment **13** was modified to better parallel property lines. Segment **15** was modified because it crossed a platted subdivision. Thus, instead of continuing east to tie in with Segment **20**, it now heads southeast to avoid the subdivision, resulting in Segment **20** becoming slightly longer and Segment **21** becoming slightly shorter. Finally, potential routes for distribution lines exiting the east side of Substation **Site B** before heading north to FM 1863 were eliminated because they are not needed at this time.

2.2 SUBSTATION SITE AND PRIMARY ALTERNATIVE ROUTE EVALUATION

The evaluation of the 3 potential substation sites (sites A, B, and C) and the 18 primary alternative routes for the project involved studying a variety of environmental factors. The analysis of each site and route involved inventorying and tabulating the number or quantity of each environmental criterion (e.g., number of habitable structures within 300 ft, amount of woodland/brushland within site or crossed by route, etc.).

The number or amount of each factor was determined by reviewing recent (2013) color aerial photography, U.S. Geological Survey (USGS) topographic maps (1:24,000), Texas Department of Transportation (TxDOT) county highway maps, FWS National Wetlands Inventory (NWI) maps, Federal Emergency Management Agency (FEMA) maps, San Antonio River Authority (SARA) maps, and by field verification from public access points. The environmental advantages and disadvantages of each potential site and each primary alternative route were then evaluated. Thirty-two environmental criteria were inventoried for each of the 3 potential substation sites, and

45 environmental criteria were inventoried for each of the 18 primary alternative routes for the project. These criteria are shown in tables 2-2 and 2-3, respectively.

TABLE 2-1

PRIMARY ALTERNATIVE ROUTE COMPOSITION AND LENGTH
BULVERDE SUBSTATION AND TRANSMISSION PROJECT

Route	Segments	Length (miles)
A1	1 – 7 – 11 – 12 – 16	5.03
A2	1 – 7 – 11 – 13 – 14 – 16	4.83
A3	1 – 7 – 11 – 13 – 15 – 21	4.89
A4	3 – 4 – 9 – 10 – 11 – 12 – 16	5.36
A5	3 – 4 – 9 – 10 – 11 – 13 – 14 – 16	5.16
A6	3 – 4 – 9 – 10 – 11 – 13 – 15 – 21	5.22
A7	3 – 5 – 20 – 21	5.02
A8	1 – 7 – 11 – 12 – 14 – 15 – 21	5.26
A9	3 – 4 – 9 – 10 – 11 – 12 – 14 – 15 – 21	5.59
B1	6 – 7 – 11 – 12 – 16	4.05
B2	6 – 7 – 11 – 13 – 14 – 16	3.85
B3	6 – 7 – 11 – 13 – 15 – 21	3.91
B4	8 – 10 – 11 – 12 – 16	4.12
B5	8 – 10 – 11 – 13 – 14 – 16	3.92
B6	8 – 10 – 11 – 13 – 15 – 21	3.98
B7	6 – 7 – 11 – 12 – 14 – 15 – 21	4.28
B8	8 – 10 – 11 – 12 – 14 – 15 – 21	4.35
C1	17 – 19 – 20 – 21	4.35

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

TABLE 2-2

ENVIRONMENTAL CRITERIA FOR SITE EVALUATION
BULVERDE SUBSTATION AND TRANSMISSION PROJECT

LAND USE

1. Number of habitable structures[1] within site footprint
2. Number of habitable structures[1] within 300 ft of site
3. Number of schools within 1,000 ft of site
4. Number of parks/recreational areas[2] in or within 1,000 ft of site
5. Number of FAA-registered airports within 20,000 ft of site
6. Number of private airstrips within 10,000 ft of site
7. Number of heliports within 5,000 ft of site
8. Number of commercial AM radio transmitters within 10,000 ft of site
9. Number of FM radio transmitters, microwave, and other electronic installations within 2,000 ft of site

AESTHETICS

10. Is site within foreground visual zone[3] of U.S. and/or state highways?
11. Is site within foreground visual zone[3] of FM roads?
12. Is site within foreground visual zone[3] of parks/recreational areas[2]?
13. Is site within foreground visual zone[3] of churches, schools, and cemeteries?

ECOLOGY

14. Percent of site in upland woodland/brushland
15. Percent of site in bottomland/riparian woodland
16. Percent of site in potential wetlands (including bottomland wetlands)
17. Is site in potential golden-cheeked warbler habitat?
18. Is site within 300 ft of potential golden-cheeked warbler habitat?
19. Is site in potential black-capped vireo habitat?
20. Is site within 300 ft of potential black-capped vireo habitat?
21. Is site in an area known to contain endangered karst invertebrate species (Zone 1)
22. Is site in an area having a high probability of containing endangered karst invertebrate species (Zone 2)
23. Is site in a critical habitat unit for endangered karst invertebrate species?
24. Is site within 500 ft of a known karst feature?
25. Is site in a 100-year floodplain?
26. Is site in the Edwards Aquifer Recharge Zone[4]?
27. Is site in the Edwards Aquifer Contributing Zone[5]?

CULTURAL RESOURCES

28. Number of recorded historic and prehistoric sites within site
29. Number of recorded historic and prehistoric sites within 1,000 ft of site
30. Number of National Register-listed, determined-eligible, or potentially eligible sites within site
31. Number of National Register-listed, determined-eligible, or potentially eligible sites within 1,000 ft of site
32. Percent of site in areas of high archeological/historical site potential

[1] Single-family and multi-family dwellings and related structures, mobile homes, apartment buildings, commercial structures, industrial structures, business structures, churches, hospitals, nursing homes, schools, or other structures normally inhabited by humans or intended to be inhabited by humans on a daily or regular basis.

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

[3] One-half mile, unobstructed.

[4] Water Pollution Abatement Plan (WPAP) required

[5] Contributing Zone Plan required if more than 5 acres of disturbance (including access roads)

TABLE 2-3

EVALUATION CRITERIA FOR ALTERNATIVE ROUTE EVALUATION
BULVERDE SUBSTATION AND TRANSMISSION PROJECT

LAND USE

1. Length of alternative route
2. Number of habitable structures[1] within ROW
3. Number of habitable structures[1] within 300 ft of ROW centerline
4. Length of ROW parallel to existing ROW (highway, road, pipeline, etc.)
5. Length of ROW parallel to property lines not following existing ROW[2]
6. Number of parks/recreational areas[3] crossed by ROW
7. Length of ROW across parks/recreational areas[3]
8. Number of parks/recreational areas[3] within 1,000 ft of ROW centerline
9. Length of ROW across cropland
10. Length of ROW across rangeland/pastureland
11. Length of ROW across land irrigated by traveling systems (rolling or pivot type)
12. Number of pipeline crossings
13. Number of transmission line crossings
14. Number of U.S. and State highway crossings
15. Number of Farm-to-Market and Ranch- to-Market road crossings
16. Number of FAA-registered airports within 10,000 ft of ROW centerline (with runway <3,200 ft)
17. Number of FAA-registered airports within 20,000 ft of ROW centerline (with runway >3,200 ft)
18. Number of private airstrips within 10,000 ft of ROW centerline
19. Number of heliports within 5,000 ft of ROW centerline
20. Number of commercial AM radio transmitters within 10,000 ft of ROW centerline
21. Number of FM radio transmitters, microwave relay stations, or other electronic installations, within 2,000 ft of ROW centerline

AESTHETICS

22. Estimated length of ROW within foreground visual zone[4] of U.S. and State highways
23. Estimated length of ROW within foreground visual zone[4] of Farm-to-Market roads
24. Estimated length of ROW within foreground visual zone[4] of parks/recreational areas[3]
25. Estimated length of ROW within foreground visual zone[4] of churches, schools, and cemeteries

ECOLOGY

26. Length of ROW across upland woodland/brushland
27. Length of ROW across bottomland/riparian woodland
28. Length of ROW across potential wetlands (including bottomland wetlands)
29. Length of ROW across known/occupied habitat of golden-cheeked warbler or black-capped vireo
30. Length of ROW within 300 ft of known/occupied habitat of golden-cheeked warbler or black-capped vireo
31. Length of ROW across potential habitat of golden-cheeked warbler or black-capped vireo
32. Length of ROW within 300 ft of potential habitat of golden-cheeked warbler or black-capped vireo
33. Length of ROW across areas known to contain endangered karst invertebrate species (Zone 1)
34. Length of ROW across areas having a high probability of containing endangered karst invertebrate species (Zone 2)

TABLE 2-3 (Cont'd)

ECOLOGY (Cont'd)

35. Length of ROW across open water (lakes, ponds)
36. Number of stream crossings
37. Length of ROW parallel to and within 100 ft of streams
38. Length of ROW across 100-year floodplains
39. Length of ROW across Edwards Aquifer Recharge Zone[5]
40. Length of ROW across Edwards Aquifer Contributing Zone[6]

CULTURAL RESOURCES

41. Number of recorded historic and prehistoric sites crossed
42. Number of recorded historic and prehistoric sites within 1,000 ft of ROW centerline
43. Number of National Register-listed, determined-eligible, or potentially eligible sites crossed
44. Number of National Register-listed, determined-eligible, or potentially eligible sites within 1,000 ft of ROW centerline
45. Length of ROW across areas of high archeological/historical site potential

[1] Single-family and multifamily dwellings and related structures, mobile homes, apartment buildings, commercial structures, industrial structures, business structures, churches, hospitals, nursing homes, schools, or other structures normally inhabited by humans or intended to be inhabited by humans on a daily or regular basis.

[2] Property lines created by existing road, highway, or railroad ROW are not "double counted" in the length of ROW parallel to property lines criterion.

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

[4] One-half mile, unobstructed.

[5] Water Pollution Abatement Plan (WPAP) required.

[6] Contributing Zone Plan required if more than 5 acres of disturbance (including access roads).

3.0 ENVIRONMENTAL SETTING

3.1 PHYSIOGRAPHY

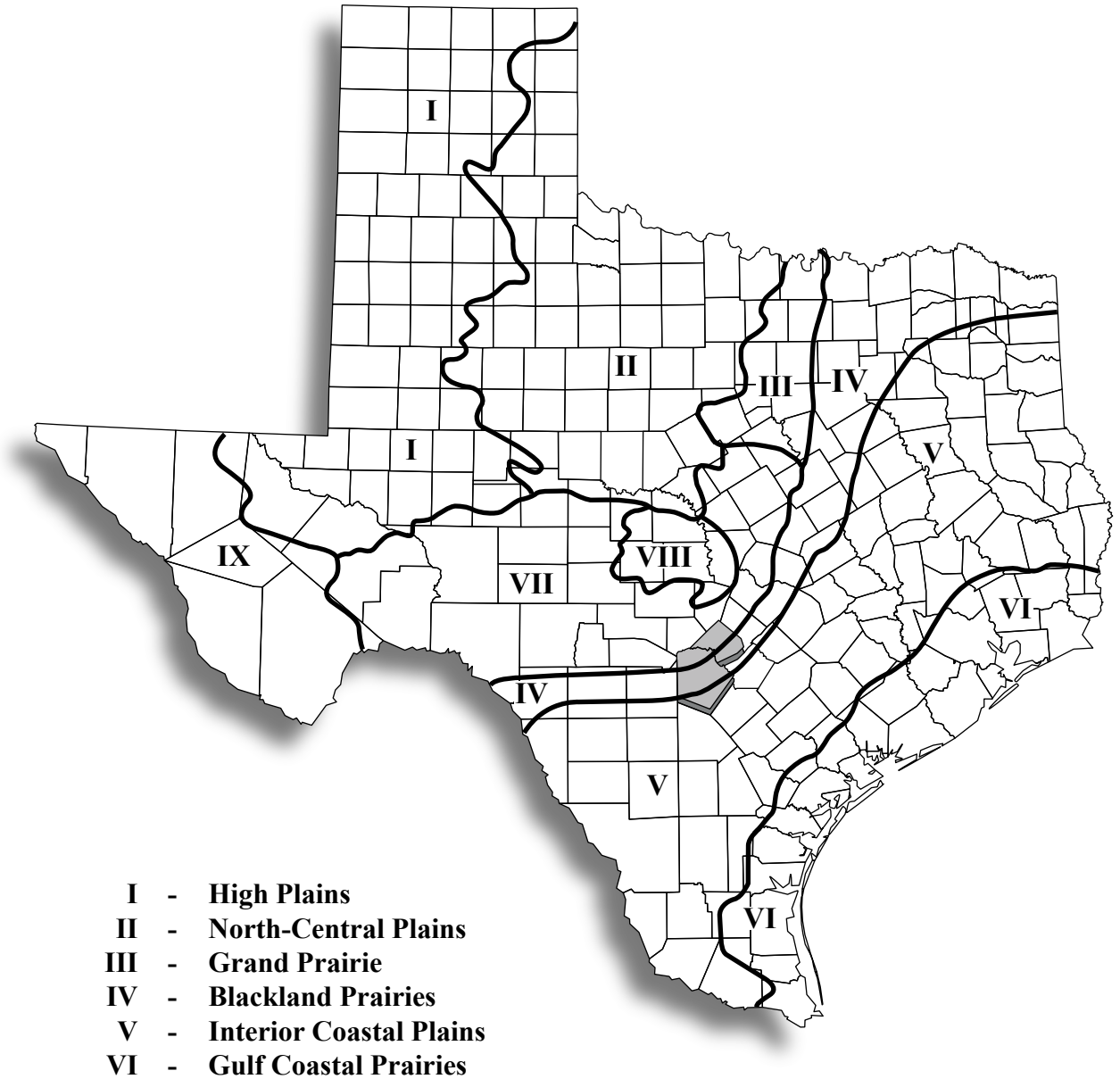
The study area occurs northeast of San Antonio in Bexar and Comal counties, and includes portions of the City of San Antonio as well as the City of Bulverde, Texas. Comal County falls within a portion of two physiographic provinces of Texas: the Edwards Plateau and Blackland Prairies (Figure 3-1). Bexar County falls within a portion of three physiographic provinces of Texas: the Edwards Plateau, the Blackland Prairies, and the Interior Coastal Plains. However, the study area itself only lies within the Edwards Plateau physiographic province (Bureau of Economic Geology [BEG], 1996). The region, known locally as the Hill Country, is characterized by plateaus, hills and rolling plains that are highly dissected by numerous, steep-walled, spring-fed streams and rivers. This type of topography, a limestone plateau marked with fractures, sinkholes, and honeycombed rock formations underlain with caves and underground streams/aquifers, is known as karst. The elevation in the study area ranges from approximately 800 ft, in the southeast portion of the study area in the Cibolo Creek drainage (Bexar-Comal county line), to approximately 1,400 ft, at a point near the center of the study area, on the north side of Smithson Valley Road and east of Ramblewood Road.

3.2 GEOLOGY

Examination of the Geologic Atlas of Texas, San Antonio Sheet (BEG, 1983), indicates that the northern portion of the study area associated with the Cibolo Creek corridor is located primarily on low terrace deposits (Qat). The remaining northern portion of the study area is located upon Glen Rose Formation (Kgru and Kgrl) and the southern portion of the study area is primarily Edwards Limestone (Ked).

Low terrace deposits (Qat) are predominately gravel, limestone, dolomite, and chert, but also contain gravel, sand, silt, and clay. They are found adjacent to the Edwards Plateau, and deposits consist of contiguous terraces of quaternary age, mostly above flood level. Within the study area, these deposits are found adjacent to Cibolo Creek.

The Glen Rose Formation, divided into upper (Kgru) and lower (Kgrl) parts, consists of limestone, dolomite, and marl as alternating resistant and recessive beds forming “stairstep” topography, with lower elevations more fossiliferous than the top. The limestone tends to be fine grained, light gray to yellowish gray, and the dolomite tends to be fine grained, porous, and yellowish brown. The upper portion (Kgru) has a thickness of approximately 400 ft, and the lower portion (Kgrl) has a thickness of approximately 500 ft; the Glen Rose Formation as a whole has a thickness of approximately 900 ft. Within the study area, the Glen Rose Formation covers roughly the northern half of the study area, as well as the Clear Fork Creek tributary creekbeds in the southern half of the study area.



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)

ATKINS

Figure 3-1

LOCATION OF BEXAR AND COMAL COUNTIES IN RELATION TO THE PHYSIOGRAPHIC PROVINCES OF TEXAS

File: N:\Clients\C_D\CPS_Energy\100032882\geo\figs\figure3-1.ai

Edwards Limestone (Ked) is a Lower Cretaceous, fine to coarse grained formation with abundant chert. It is medium gray to grayish brown, with reef and shell fragments commonplace. Solution zones and collapse breccias are common in this formation, and thickness ranges from 300 to 500 ft. This formation is found throughout roughly the southern half of the study area.

The Tectonic Map of Texas (BEG, 1997) indicates that the potential substation sites are located within the Balcones Fault Zone and that a geologic faulting is mapped within the study area, primarily in a southwest-northeast alignment.

3.3 SOILS

3.3.1 Soil Associations

The study area occurs within six soil associations: the Comfort-Rumple-Eckrant Association, the Brackett-Comfort-Real Association, the Lewisville-Gruene-Krum Association, the Tarrant-Brackett Association, the Crawford-Bexar Association, and the Lewisville-Houston Black Association (Soil Conservation Service [SCS, now the Natural Resources Conservation Service (NRCS)], 1984, 1991).

Comal County

Comfort-Rumple-Eckrant Association

This association is made up of very shallow to moderately deep, undulating to steep and hilly soils. It occurs over indurated limestone on uplands of the Edwards Plateau, on slopes of 1 to 30%, and is composed of approximately 36% Comfort soils, 26% Rumple soils, 8% Eckrant soils, and negligible amounts of several other types of soils. This association can be found in a small northeastern portion of the study area.

Brackett-Comfort-Real Association

This association is made up of shallow, undulating to steep soils over limestone or strongly cemented chalk on uplands of the Edwards Plateau. These soils are well drained and occur on slopes of 1 to 30%, and are approximately 23% Brackett soils, 17% Comfort soils, 9% Real soils, and smaller amounts of other soils. This association can be found on most of the study area north of Cibolo Creek.

Lewisville-Gruene-Krum Association

This association is made up of deep, shallow, and very shallow soils on nearly level to gently sloping ground. They tend to form over loamy, clayey, and gravelly sediments on stream terraces and valley fills of both Blackland Prairie and the Edwards Plateau. This association consists of approximately 27% Lewisville soils, 14% Gruene soils, 13% Krum soils, and traces of other types of soils. Within the study area, this association can be found along the north side of Cibolo Creek in the western half of the study area.

Bexar County

Tarrant-Brackett Association

This association is made up of shallow and very shallow soils over limestone in the northern portion of Bexar County, on the Edwards Plateau. About 65% of the association consists of Tarrant soils, with approximately 20% being Brackett soils. The association is on gently sloping to very steep topography, is shallow or very shallow, dark or light colored, stony, and moderately permeable.

Crawford-Bexar Association

This association is made up of moderately deep, stony soils over limestone on the Edwards Plateau. It occupies a broad, nearly level to gently sloping area and flanked by Tarrant soils. The association is approximately 44% Crawford soils, 41% Bexar soils, 10% Tarrant soils, and 5% Lewisville and Houston Black soils, and occurs in the northern third of Bexar County. Within the study area, this association can be found in the south-central portion, west of Cibolo Creek but east of the study area's western boundary.

Lewisville-Houston Black Association

This association is made up of deep, calcareous clayey soils in old alluvium, and occupies much of the central portions of Bexar County, as well as small areas along the northern, northeastern, and western boundaries along principal streams and old outwash plains. This association is approximately 45% Lewisville soils, 40% Houston Black soils, and negligible traces of other soils. Within the study area, this association can be found adjacent to Cibolo Creek in the western half of the study area, in the flat plains surrounding the waterway.

3.3.2 Prime Farmland Soils

Prime farmland soils are defined by the Secretary of Agriculture in 7 CFR, Part 657 (*Federal Register* [FR], Vol. 43, No. 21) as those soils that have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. They have the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management, according to acceptable farming methods. Additional potential prime farmland are those soils that meet most of the requirements of prime farmland but fail because they lack sufficient natural moisture or they lack the installation of water management facilities. Such soils would be considered prime farmland if these practices were installed. According to the NRCS (2013a, 2013b), approximately 16.5% (132,402 acres) of Comal and Hays counties (the 1984 soil survey includes both counties concurrently and dividing their data was not feasible) contain prime farmland soils. Approximately 19.7% (158,261 acres) of Bexar County contains prime farmland soils.

3.4 WATER RESOURCES

3.4.1 Surface Water

The study area lies entirely within the San Antonio River basin, which has a total drainage area of 4,180 square miles. The San Antonio River basin is bounded on the north and east by the Guadalupe River Basin, and on the west and south by the Nueces River Basin and the San Antonio-Nueces Coastal Basin (Texas Water Development Board [TWDB], 2007). Surface water runoff in the study area drains into Cibolo Creek, whether directly or via Indian Creek, Clear Fork Creek, West Fork Cibolo Creek, Lewis Creek, Elm Waterhole Creek, or associated, unnamed tributaries. Cibolo Creek itself is a tributary of the San Antonio River, which ultimately runs into the Gulf of Mexico.

3.4.2 Floodplains

According to FEMA's Flood Map Viewer (FEMA, 2013), the creeks mentioned above in Section 3.4.1 are considered to be in "Zone AE," or the 100-year floodplain. These exist along the northern portion of the study area, running west to east in the case of Cibolo Creek; the south-central portion of the study area in the case of West Fork Creek and Clear Fork Creek; the southwestern portion of the study area in the case of Elm Waterhole Creek; and the northeastern portion of the study area in the case of Lewis Creek. These drainages and their associated 100-year floodplains can be found on Figure 2-1, located in the map pocket.

3.4.3 Groundwater

The study area lies above two major Texas aquifers. According to the TWDB (2012), the principal groundwater-bearing units in the area are the Trinity Aquifer and the Edwards Aquifer (Balcones Fault Zone). The Edwards Aquifer lies underneath primarily the southeastern portion of the study area, while the Trinity Aquifer underlies the entire study area; it lies beneath the Edwards Aquifer where that aquifer occurs.

The Cretaceous-age Trinity Aquifer is a collection of individual aquifers including the Antlers, Glen Rose, Paluxy, Twin Mountains, Travis Peak, Hensell, and Hosston aquifers. These individual aquifers, when combined as the Trinity Aquifer, cover an area of 61 counties in Texas. Discharge from the aquifer occurs from water well withdrawals and springs located within streams. Groundwater yields in the Trinity Aquifer vary significantly depending on the porosity and permeability of the strata, with most springs discharging less than 10 cubic feet per second (TWDB, 2007). The most recent estimate of existing groundwater supply for the Trinity Aquifer was 254,384 acre-feet per year in 2010, with a projected supply of 249,040 acre-feet by the year 2060, only a 2% decrease in the 50-year span (TWDB, 2012).

The Cretaceous-age Edwards Aquifer (Balcones Fault Zone [BFZ], as opposed to the Edwards-Trinity [Plateau] and Edwards-Trinity [High Plains] aquifers) covers an area of 4,350 square miles in parts of 11 different counties, forming a narrow belt from Kinney County to Bell County. The

aquifer is composed predominately of limestone, with thickness from 200 to 600 ft, with highly permeable solution zones and channels because of its extensive honeycombed and cavernous character. Water in the aquifer moves from the recharge zone toward natural discharge points in the artesian zone, such as Comal, San Marcos, Barton, and Salado springs. As opposed to the Trinity Aquifer, which has slow groundwater yields, some wells and springs discharge up to 24,000 gallons per minute (TWDB, 1995). The most recent estimate of existing groundwater supply for the Edwards (BFZ) Aquifer was 338,778 acre-feet per year in 2010, with a projected supply of 338,763 acre-feet by the year 2060, for virtually no decrease in the 50-year span (TWDB, 2012). Two separate zones of the Edwards Aquifer BFZ occur in the study area: the recharge zone, with highly permeable limestone, occurs in roughly the southern half of the study area as well as the alluvial plain surrounding Cibolo Creek, and the contributing zone, which primarily carries runoff to the recharge zone, located in a broad swath in the center of the study area, as well as the northern portion of the study area north of Cibolo Creek.

3.5 VEGETATION

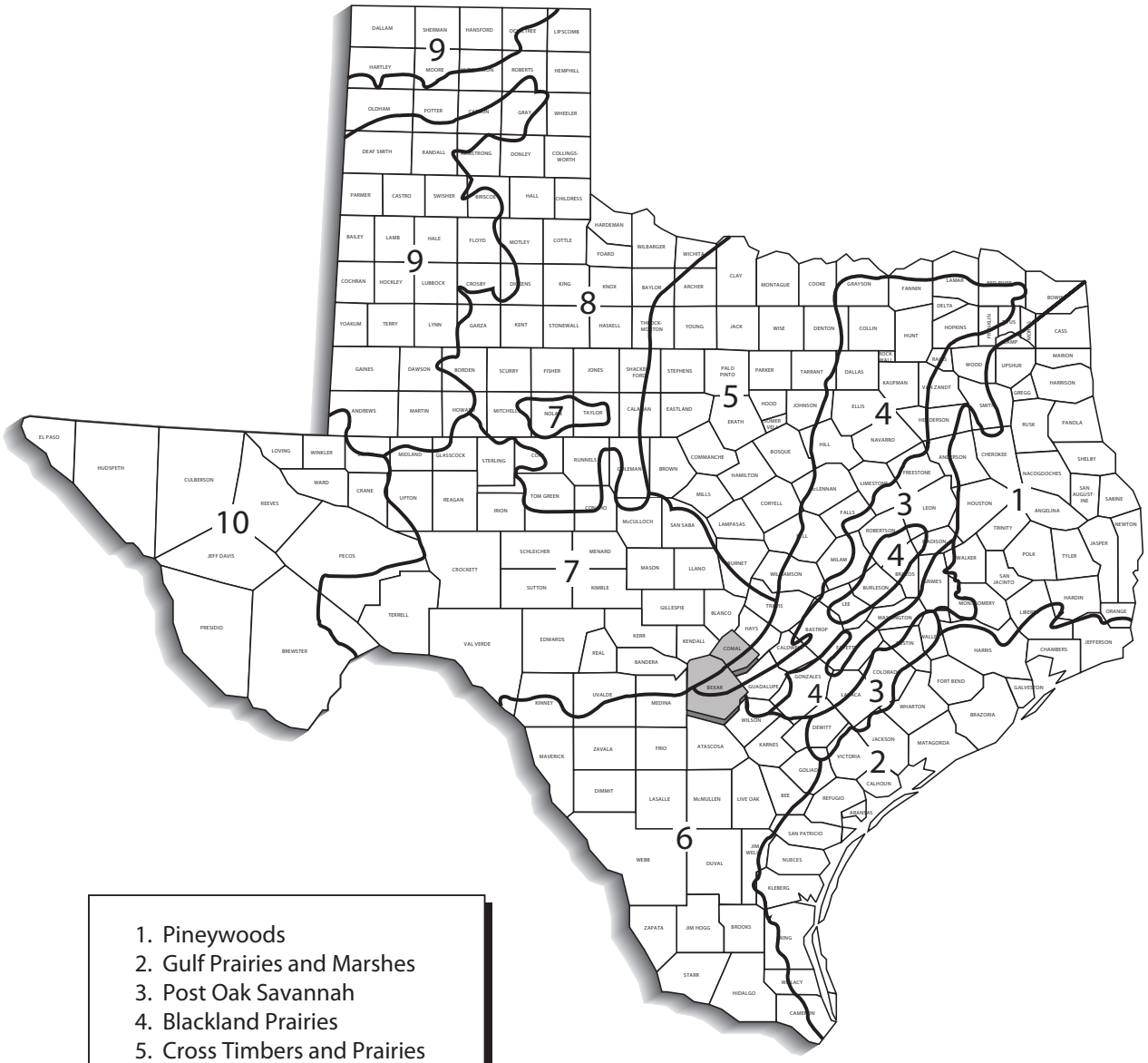
3.5.1 Regional Vegetation

The study area lies near the border of two vegetational areas, the Edwards Plateau, and the Blackland Prairies, as delineated in Hatch et al. (1990) and shown on Figure 3-2. The Edwards Plateau vegetational area correlates to the area known as the Texas Hill Country. The climax vegetation of the Edwards Plateau is largely grassland or open savannah, although many brush and/or invader species have colonized the area. Average annual precipitation in the Edwards Plateau area ranges from 15 to 33 inches. Much of the region is in use as rangeland, with agricultural usage confined to deeper soils along floodplains and some divides (Hatch et al., 1990).

The Blackland Prairies represent the southern extension of the true prairie that occurs from Texas to Canada. Characteristics include nearly level to rolling, well-dissected terrain. Prairie grasses, interspersed with scattered tree species, dominated the natural vegetation community of the Blackland. Dominant species included little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardii*), yellow indiangrass (*Sorghastrum nutans*), and tall dropseed (*Sporobolus compositus* var*. compositus*), with sideoats grama (*Bouteloua curtipendula*), hairy grama (*Bouteloua hirsuta*), and buffalograss (*Buchloe dactyloides*) as minor constituents. Almost the entire region is now cropland and pastureland (Hatch et al., 1990).

3.5.1 Vegetation in the Study Area

Much of the natural vegetation in the study area is live oak woodland, although riparian habitat associated with Cibolo Creek is also prominent. Plateau live oak (*Quercus virginiana* var. *fusiformis*) is the dominant canopy species in the live oak woodland community, with Ashe juniper (*Juniperus ashei*), honey mesquite (*Prosopis glandulosa*), cedar elm (*Ulmus crassifolia*), and netleaf hackberry



Source: Hatch et al. (1990)

ATKINS

Figure 3-2

LOCATION OF BEXAR AND COMAL COUNTIES IN RELATION TO THE VEGETATIONAL AREAS OF TEXAS

File: N:\Clients\C_D\CPS_Energy\100032882\geo\figs\figure3-2.ai

(*Celtis laevigata* var. *reticulata*) occurring in lesser numbers. The degree of canopy coverage is dependent upon the amount of brush/tree clearing that has taken place. Shrubby understory species include Texas kidneywood (*Eysenhardtia texana*), Texas persimmon (*Diospyros texana*), huisache (*Acacia farnesiana* var. *farnesiana*), retama (*Parkinsonia aculeata*), elbowbush (*Forestiera pubescens*), prairie sumac (*Rhus lanceolata*), evergreen sumac (*Rhus virens*), Texas mountain laurel (*Sophora secundiflora*), American beautyberry (*Callicarpa americana*), bluewood or brasil (*Condalia hookeri*), and agarito (*Berberis trifoliata*). Pricklypears (*Opuntia* spp.) and twist-leaf yucca (*Yucca rupicola*) are also present.

Grassland species in the study area include gramas (*Bouteloua* spp.), curlymesquite (*Hilaria belangeri*), little bluestem, King Ranch bluestem (*Bothriochloa ischaemum*), buffalograss, bermudagrass (*Cynodon dactlyon*), beargrass (*Nolina* sp.), johnsongrass (*Sorghum halepense*), threeawns (*Aristida* spp.), brome grasses (*Bromus* spp.), panicums (*Panicum* spp.), paspalums (*Paspalum* spp.), and species of *Tridens*. Forbs present in the grassland community include common sunflower (*Helianthus annuus*), arrowleaf sida (*Sida rhombifolia*), vervain (*Verbena* sp.), frog-fruit (*Phyla* sp.), and croton (*Croton* sp.).

As noted above, streamside communities (bottomland/riparian vegetation) are also prominent in the study area. These communities are associated with Cibolo Creek, Indian Creek, Lewis Creek, West Fork Cibolo Creek, Clear Fork Creek, Elm Waterhole Creek, and several minor unnamed creeks. The most prominent of these, Cibolo Creek, runs from the northwestern to the southeastern portion of the study area. Canopy species include plateau live oak and Ashe juniper along the upper terraces, while cedar elm, American sycamore (*Platanus occidentalis*), cottonwood (*Populus deltoides*), and sugar hackberry (*Celtis laevigata*) can be found on the lower terraces. Grasses occurring in riparian habitats in the study area include switchgrass (*Panicum virgatum*), Canada wild-rye (*Elymus canadensis*), and Lindheimer muhly (*Muhlenbergia lindheimeri*). Disturbed areas are characterized by such species as false willow (*Baccharis* sp.), switchgrass (*Panicum virgatum*), and ragweed (*Ambrosia* sp.).

Hydric and aquatic vegetation also occurs in the study area, particularly in association with Cibolo Creek. Hydric habitat includes small marshy areas that fringe the edges of creeks, impoundments, and topographically low areas. These habitats typically support such species as sedges (*Carex* spp.), flatsedges (*Cyperus* spp.), rushes (*Juncus* spp.), and smartweeds (*Polygonum* spp.). Woody species commonly occurring include black willow (*Salix nigra*), common buttonbush (*Cephalanthus occidentalis*), and rattlebush (*Sesbania* sp.). Hydric habitats in the study area may be defined as jurisdictional wetlands by the USACE. If these areas meet the criteria necessary to define them as jurisdictional wetlands pursuant to Section 404 of the Clean Water Act, certain activities (e.g., placement of fill) within these areas are subject to regulation.

Aquatic habitat includes those areas that are predominantly water-covered (e.g., lakes, rivers, ponds, and major streams). Aquatic and hydric-adapted species found within aquatic habitats in the study area may include pondweeds (*Potamogeton* spp.), cattail (*Typha* sp.), black willow,

spikerushes (*Eleocharis* spp.), and sedges. Marshy and aquatic habitats that occur along the water's edge are important primarily because of their value as feeding, breeding, nesting, and sheltering areas for wildlife.

No native plant species within the study area are particularly valuable commercially. Juniper may be cut locally for fence posts, and some hardwood trees, such as oaks, may be important for firewood. A number of plant species are used as browse or forage materials for wildlife and livestock, and could therefore be considered important. Browse and forage plants include acacia (*Acacia* spp.), hackberry (*Celtis* spp.), Texas persimmon, honey mesquite, and greenbriars (*Smilax* spp.), along with numerous forbs.

3.6 FISH AND WILDLIFE

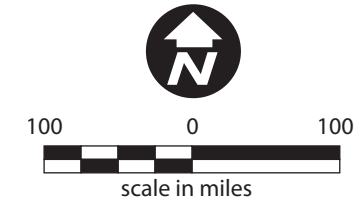
3.6.1 Fish and Wildlife Habitats and Species

Blair (1950) delineated seven biotic provinces within Texas. The study area lies near the junction of three of these provinces: the Balconian Biotic Province, the Tamaulipan Biotic Province, and the Texan Biotic Province (Figure 3-3). The faunal communities of the Balconian Biotic Province are a composite of eastern forest species and western grassland species. This province closely coincides with the Edwards Plateau as described by Hatch et al. (1990). Wildlife habitats within the study area generally correspond to vegetation types described in Section 3.5.2 and include upland woodland/brushland, riparian/bottomland woodland, grassland, and hydric/aquatic areas. Given the urban nature of some parts of the study area, some of the wildlife species in the study area are typical of those encountered in commercial and residential areas.

Aquatic habitats within the study area are largely limited to Cibolo Creek, which runs from the north-western to the southeastern portion of the study area, and West Fork Cibolo Creek and Clear Fork Creek, which run in the southeastern portion of the study area. Because these streams are frequently low for a substantial portion of the year, the species that can utilize them are restricted either to those having some adaptation to surviving dry periods or to species adapted to rapidly recolonizing disturbed habitats.

Fish species in the study area are probably restricted because of the limited permanent water. Typical species of intermittent and smaller permanent creeks include forage fish assemblages dominated by minnows (*Notropis* spp.) that serve as a food resource for predatory species. Fish communities in pool areas tend to be heavily dominated by centrarchids. The bluegill (*Lepomis macrochirus*), longear sunfish (*Lepomis megalotis*), and redear sunfish (*Lepomis microlophus*) may be present in the study area when sufficient water is present.

Amphibian species (salamanders, newts, frogs, and toads) of potential occurrence within the study area include the eastern cricket frog (*Acris crepitans crepitans*), Texas toad (*Anaxyrus speciosus*), cliff chirping frog (*Eleutherodactylus marnockii*), Great Plains narrow-mouthed toad (*Gastrophryne*



ATKINS

Figure 3-3

LOCATION OF BEXAR AND COMAL COUNTIES IN RELATION TO THE BIOTIC PROVINCES OF TEXAS

Source: Blair (1950)

File: N:\Clients\C_D\CPS_Energy\100032882\geo\figs\figure3-3.ai

olivacea), Cope's gray treefrog/gray treefrog (*Hyla chrysoscelis/versicolor*), spotted chorus frog (*Pseudacris clarkii*), Rio Grande leopard frog (*Lithobates berlandieri*), American bullfrog (*Lithobates catesbeiana*), Gulf Coast toad (*Ollotis nebulifer*), and Couch's spadefoot (*Scaphiopus couchii*) (Bartlett and Bartlett, 1999; Dixon, 2000; Crother, 2008).

Reptiles (lizards, snakes, and turtles) of potential occurrence in the study area include lizard species such as the green anole (*Anolis carolinensis*), Texas spotted whiptail (*Aspidoscelis gularis gularis*), Texas greater earless lizard (*Cophosaurus texanus texanus*), Texas alligator lizard (*Gerrhonotus infernalis*), short-lined skink (*Plestiodon tetragrammus brevilineatus*), prairie lizard (*Sceloporus consobrinus*), Texas spiny lizard (*Sceloporus olivaceus*), and little brown skink (*Scincella lateralis*) (Bartlett and Bartlett, 1999; Dixon, 2000; Crother, 2008;).

Snakes of potential occurrence within the study area include the eastern yellow-bellied racer (*Coluber constrictor flaviventris*), Texas ratsnake (*Pantherophis obsoletus*), western coachwhip (*Coluber flagellum testaceus*), Texas patch-nosed snake (*Salvadora grahamiae lineata*), flat-headed snake (*Tantilla gracilis*), checkered gartersnake (*Thamnophis marcianus*), and venomous species such as the western cottonmouth (*Agkistrodon piscivorus leucostoma*), and western diamond-backed rattlesnake (*Crotalus atrox*) (Tennant, 1998; Dixon, 2000; Werler and Dixon, 2000; Crother, 2008).

Avian species in the study are a combination of urban species and rural species. Resident avian species encountered by Atkins in the study area include the black vulture (*Coragyps atratus*), turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), rock pigeon (*Columba livia*), Eurasian collared-dove (*Streptopelia decaocto*), white-winged dove (*Zenaida asiatica*), mourning dove (*Zenaida macroura*), western scrub-jay (*Aphelocoma californica*), northern mockingbird (*Mimus polyglottos*), lark sparrow (*Chondestes grammacus*), northern cardinal (*Cardinalis cardinalis*), and house sparrow (*Passer domesticus*). Additional resident avian species expected in the study area include the great egret (*Ardea alba*), red-shouldered hawk (*Buteo lineatus*), killdeer (*Charadrius vociferus*), golden-fronted woodpecker (*Melanerpes aurifrons*), downy woodpecker (*Picoides pubescens*), eastern phoebe (*Sayornis phoebe*), loggerhead shrike (*Lanius ludovicianus*), American crow (*Corvus brachyrhynchos*), Carolina chickadee (*Poecile carolinensis*), black-crested titmouse (*Baeolophus atricristatus*), Carolina wren (*Thryothorus ludovicianus*), Bewick's wren (*Thryomanes bewickii*), American robin (*Turdus migratorius*), European starling (*Sturnus vulgaris*), eastern meadowlark (*Sturnella magna*), and great-tailed grackle (*Quiscalus mexicanus*) (Lockwood and Freeman, 2004; San Antonio Audubon Society [SAAS], 2004).

Summer residents encountered in the study area by Atkins include the scissor-tailed flycatcher (*Tyrannus forficatus*) and barn swallow (*Hirundo rustica*). Other summer residents expected to occur in the study area include the chimney swift (*Chaetura pelagica*), western kingbird (*Tyrannus verticalis*), yellow-billed cuckoo (*Coccyzus americanus*), common nighthawk (*Chordeiles minor*), black-chinned hummingbird (*Archilochus alexandri*), great crested flycatcher (*Myiarchus crinitus*), summer tanager (*Piranga rubra*), blue grosbeak (*Guiraca caerulea*), painted bunting (*Passerina*

ciris), dickcissel (*Spiza americana*), and orchard oriole (*Icterus spurius*) (Lockwood and Freeman, 2004; SAAS, 2004).

Winter residents expected to occur in the study area include the sharp-shinned hawk (*Accipiter striatus*), American kestrel (*Falco sparverius*), spotted sandpiper (*Actitis macularius*), Wilson's snipe (*Gallinago delicata*), belted kingfisher (*Megaceryle alcyon*), yellow-bellied sapsucker (*Sphyrapicus varius*), northern flicker (*Colaptes auratus*), house wren (*Troglodytes aedon*), ruby-crowned kinglet (*Regulus calendula*), hermit thrush (*Catharus guttatus*), cedar waxwing (*Bombycilla cedrorum*), orange-crowned warbler (*Vermivora celata*), yellow-rumped warbler (*Setophaga coronata*), spotted towhee (*Pipilo maculatus*), Lincoln's sparrow (*Melospiza lincolnii*), white-throated sparrow (*Zonotrichia albicollis*), dark-eyed junco (*Junco hyemalis*), Brewer's blackbird (*Euphagus cyanocephalus*), and American goldfinch (*Spinus tristis*) (Lockwood and Freeman, 2004; SAAS, 2004). Additional bird species would be expected to occur briefly in the study area during spring and fall migration.

Mammals expected to occur in the study area include the Virginia opossum (*Didelphis virginiana*), nine-banded armadillo (*Dasypus novemcinctus*), eastern cottontail (*Sylvilagus floridanus*), black-tailed jackrabbit (*Lepus californicus*), eastern fox squirrel (*Sciurus niger*), hispid pocket mouse (*Chaetodipus hispidus*), North American porcupine (*Erethizon dorsatum*), common gray fox (*Urocyon cinereoargenteus*), ringtail (*Bassariscus astutus*), northern raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), bobcat (*Lynx rufus*), and white-tailed deer (*Odocoileus virginianus)* (Schmidly, 2004).

3.7 ENDANGERED AND THREATENED SPECIES

3.7.1 Endangered and Threatened Plant Species

Available information from the FWS, Texas Parks and Wildlife Department (TPWD), and TPWD's Natural Diversity Database (NDD) was reviewed to identify endangered or threatened plant species of potential occurrence within the study area. No federal-/state-listed species have been recorded from Bexar County or Comal County (Poole et al., 2000; FWS, 2013a; TPWD, 2013a); however, the bracted twistflower (*Streptanthus bracteatus*) is a candidate for federal listing. Additionally, FWS includes the federally listed endangered Texas wild-rice on its Bexar and Comal County lists. This species is endemic to Hays County, but FWS includes it on its Bexar and Comal County lists only because activities within the southern segment of the Edwards Aquifer, which includes Bexar and Comal counties, may affect it. Texas wild-rice does not occur in the study area and no further discussion of the species is included in this EA.

The bracted twistflower, a herbaceous annual of the mustard family, is known from eight counties in south-central Texas. It is distinguished from other members of the genus by the leaves of the flower stalk lacking stems. The species is most often reported under a canopy of Ashe juniper or Texas live oak, and is frequently found within a dense understory to protect it from browsing (FWS,

2012a). Habitat loss due to urban and residential land development is the most serious threat to the species. While no documented occurrences of this species occur within the study area (TPWD, 2013b), although unlikely, it may exist in the study area in appropriate habitat.

3.7.2 Endangered and Threatened Fish and Wildlife Species

FWS and TPWD county lists of endangered and threatened species indicate that 39 federally and/or state-listed endangered/threatened wildlife species and 1 federal candidate wildlife species may occur in Bexar County or Comal County (Table 3-1). 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).

Nineteen taxa in Table 3-1 are federally endangered; 4 of these 19 are also state-listed as endangered: the whooping crane (*Grus americana*), interior least tern (*Sternula antillarum*), black-capped vireo (*Vireo atricapilla*), and golden-cheeked warbler (*Dendroica chrysoparia*). The other 15 federally endangered species are 12 invertebrates, the fountain darter (*Etheostoma fonticola*), Texas blind salamander (*Eurycea rathbuni*), and jaguarundi (*Puma yagouaroundi*).

The whooping crane is a large wading bird that in the last 50 years has returned from the brink of extinction. Only four wild populations of whooping crane exist, the largest of which is the Aransas/ Wood Buffalo population, which breeds in Wood Buffalo National Park in northern Canada and migrates annually to Aransas National Wildlife Refuge (NWR) and adjacent areas of the central Texas coast in Aransas, Calhoun, and Refugio counties, where it winters (FWS, 1995; Lewis, 1995; Canadian Wildlife Service [CWS] and FWS, 2007). Three other smaller wild populations exist that include non-migrating Florida and Louisiana populations, and another that migrates between Wisconsin and Florida. None of these is self-sustaining and each is designated "experimental." During migration, whooping cranes frequently stop over at wetlands and pastures to roost and feed. Whooping cranes have an unpredictable pattern of stopover habitat use and may not use the same stopover sites annually. Whooping cranes are diurnal migrants and often stop wherever they happen to be late in the day when they find conditions no longer suitable for migration. Thus, a few cranes could stop at a small farm pond or wetland for one night and rarely or never use the same location again. Some areas, however, are used on a regular basis and would be considered traditional stopover sites. Because of weather conditions, including strong winds that may blow the birds off course to the east or west, the whooping crane migration corridor may be more than 200 miles wide (FWS, 2009). The study area is located just outside the western edge of the regular migration corridor of this species; thus whooping cranes may, although unlikely, pass through the study area during migration.

TABLE 3-1

ENDANGERED AND THREATENED FISH AND WILDLIFE SPECIES OF KNOWN OR POTENTIAL OCCURRENCE IN BEXAR AND COMAL COUNTIES, TEXAS[1]

Common Name[2]	Scientific Name[2]	Status[3]	
		FWS	TPWD
INVERTEBRATES			
Helotes mold beetle	*Batrisodes venyivi*	E	--
Comal Springs riffle beetle	*Heterelmis comalensis*	E	--
Comal Springs dryopid beetle	*Stygoparnus comalensis*	E	--
Ground beetle (no common name)	*Rhadine exilis*	E	--
Ground beetle (no common name)	*Rhadine infernalis*	E	--
Peck's cave amphipod	*Stygobromus* (=*Stygonectes*) *pecki*	E	--
Robber Baron Cave meshweaver	*Cicurina baronia*	E	--
Madla's Cave meshweaver	*Cicurina madla*	E	--
Braken Bat Cave meshweaver	*Cicurina venii*	E	--
Government Canyon Bat Cave meshweaver	*Cicurina vespera*	E	--
Government Canyon Bat Cave spider	*Neoleptoneta microps*	E	--
Cokendolpher Cave harvestman	*Texella cokendolpheri*	E	--
MOLLUSKS			
Texas fatmucket	*Lampsilis bracteata*	C	T
Golden orb	*Quadrula aurea*	C	T
Texas pimpleback	*Quadrula petrina*	C	T
False spike mussel	*Quadrula mitchelli*	--	T
FISHES			
Fountain darter	*Etheostoma fonticola*	E	--
Widemouth blindcat	*Satan eurystomus*	--	T
Toothless blindcat	*Trogloglanis pattersoni*	--	T
AMPHIBIANS			
Texas blind salamander	*Eurycea (=Typhlomolge) rathbuni*	E	--
San Marcos salamander	*Eurycea nana*	T	--
Cascade Caverns salamander	*Eurycea latitans*	--	T
Comal blind salamander	*Eurycea tridentifera*	--	T
REPTILES			
Texas horned lizard	*Phrynosoma cornutum*	--	T
Timber/canebrake rattlesnake	*Crotalus horridus*	--	T
Texas indigo snake	*Drymarchon melanurus erebennus*	--	T

TABLE 3-1 (Cont'd)

Common Name[2]	Scientific Name[2]	Status[3] FWS	Status[3] TPWD
Texas tortoise	*Gopherus berlandieri*	--	T
Cagle's map turtle	*Graptemys caglei*	--	T
BIRDS			
Whooping crane	*Grus americana*	E	E
Least tern (interior subspecies)	*Sternula antillarum*	E	E
Black-capped vireo	*Vireo atricapilla*	E	E
Golden-cheeked warbler[4]	*Dendroica chrysoparia*[4]	E	E
Sprague's pipit	*Anthus spragueii*	C	--
Wood stork	*Mycteria americana*	--	T
White-faced ibis	*Plegadis chihi*	--	T
Bald eagle	*Haliaeetus leucocephalus*	--	T
Zone-tailed hawk	*Buteo albonotatus*	--	T
Peregrine falcon	*Falco peregrinus*	--	T
MAMMALS			
Jaguarundi	*Puma yagouaroundi*	E	E
American black bear	*Ursus americanus*	T/SA;--[5]	T

[1] According to FWS (2013a) and TPWD (2013a, 2013b).

[2] Nomenclature follows American Ornithologists' Union (AOU, 1998, 2000, 2002–2013), Hubbs et al. (2008), Crother (2008), Manning et al. (2008), FWS (2013a), and TPWD (2013a).

[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] The golden-cheeked warbler has been reclassified from *Dendroica* to *Setophaga* (AOU, 2011)

[5] 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, including Bexar and Comal counties.

In Texas, the interior least tern historically nested on sandbars of the Colorado River, Red River, and Rio Grande. At the present time, only small breeding populations exist at isolated locations within the species' historic range, although its winter range includes the entire Texas Gulf Coast. The interior least tern's preferred nesting habitat is unvegetated, frequently flooded sand flats, salt flats, sand and gravel bars, and sand, shell, and/or gravel beaches (Campbell, 1995; Thompson et al., 1997). With the manipulation of river hydrology (i.e., damming, water diversions, channelization, etc.), nesting habitat (e.g., sandbars and islands) are now scarce; thus, least terns have acclimated to using similar habitats such as gravel pits, coal mines, roof tops, and other areas consisting of large areas of bare ground typically associated with disturbances (Kasner and Slack, 2002). This tern is unlikely to occur in the study area except as a rare migrant.

The black-capped vireo is a rare to locally common summer resident in the Edwards Plateau, Cross Timbers and Prairies, and Trans-Pecos regions of Texas, where it nests in patchy shrubland/ brushland containing dense woody cover between ground level and approximately 6 ft. The composition of woody species is not as important as the structure, and species composing potential habitat vary throughout the species' range. Dominant tree and shrub species present in suitable breeding habitat may include various oaks (*Quercus* spp.), sumacs (*Rhus* spp.), Texas persimmon, agarito, condalia (*Condalia* spp.), elbowbush, lotebush, and, occasionally, Ashe juniper and honey mesquite (Marshall et al., 1985; Grzybowski, 1995). The species is a rare and localized summer resident in Bexar and Comal counties. It has not been recorded within the study area, the closest known record being over 10 miles away (TPWD, 2013b). It is of potential though unlikely occurrence in the study area due to lack of suitable habitat.

The golden-cheeked warbler is currently a rare to locally common summer resident in about 28 central Texas counties, which comprise the species' entire breeding range. The species is a habitat specialist, occurring only in oak-juniper woodlands that contain a dense deciduous canopy and mature Ashe junipers, the bark of which they use in nest construction. Common canopy species in suitable habitat include Ashe juniper, plateau live oak, Texas red oak (*Quercus buckleyi*), post oak (*Quercus stellata*), cedar elm, hackberries (*Celtis* spp.), Texas ash (*Fraxinus texensis*), and, occasionally, escarpment black cherry (*Prunus serotina*) and sycamore (Ladd and Gass, 1999). Suitable habitat typically occurs in areas of steep slopes, canyons, draws, and adjacent ridges and uplands (Ladd and Gass, 1999). The species is a rare and localized summer resident in Bexar and Comal counties, and records exist from 2001–2005 within the southwestern portion of the study area (TPWD, 2013b). Although much of this area has been cleared for development in recent years, enough suitable habitat is still present to sustain territories, and it is likely that golden-cheeked warblers still occur in the study area.

Nine endangered obligate troglobites (cave-dwelling species) are of local distribution in caves in northern Bexar County. While federally listed as endangered, TPWD does not currently list them as endangered or threatened. They are the Helotes mold beetle (*Batrisodes venyivi*), two ground beetles (no common names – *Rhadine exilis* and *Rhadine infernalis*), Robber Baron Cave meshweaver (*Cicurina baronia*), Madla's Cave meshweaver (*Cicurina madla*), Braken Bat Cave meshweaver (*Cicurina venii*), Government Canyon Bat Cave meshweaver (*Cicurina vespera*), Government Canyon Bat Cave spider (*Neoleptoneta microps*), and Cokendolpher cave harvestmen (*Texella cokendolpheri*). These species are typically small and eyeless. As of February 2012, 518 caves are known to occur in Bexar County (Texas Speleological Society [TSS], 2013), at least 74 of which contain known populations of at least one of the nine listed Bexar County karst invertebrates; none of these 74 caves is located within the study area. Four karst zones occur in the study area. Zone 1, which occurs in the southwest corner of the study area (see Figure 2-1, map pocket), consists of areas known to contain listed karst invertebrate species. Zone 2, which occurs throughout the majority of the central and southeastern portion of the study area, consists of areas having a high probability of containing habitat suitable for listed karst

invertebrate species. Zone 3, which occurs in the northern-central portion of the study area, consists of areas that probably do not contain endangered karst invertebrate species, and Zone 5 occurs in the eastern portion of the study area and consists of areas that do not contain endangered karst invertebrate species. While no known records of endangered karst invertebrates exist in the study area (TPWD 2013b), these do have the potential to occur within the study area.

Six species in Table 3-1 are Edwards Aquifer fish and wildlife species. While these species are endemic to Hays and/or Comal counties, FWS includes them because activities within the southern segment of the Edwards Aquifer, which includes Bexar County, may affect them. These are the federally listed endangered Comal Springs riffle beetle (*Heterelmis comalensis*), Comal Springs dryopid beetle (*Stygoparnus comalensis*), Peck's cave amphipod (*Stygobromus pecki*), fountain darter, and Texas blind salamander, as well as the federally listed threatened San Marcos salamander (*Eurycea nana*). None of these species occurs in the study area.

The Comal Springs riffle beetle, a slender aquatic insect, is known only from collected specimens from the Edwards Aquifer and associated habitats at Comal Springs in New Braunfels and Fern Bank Springs near Wimberley, Texas (TPWD, 2013c). The entire known range of this species is outside of the study area, and no documented occurrences of this species occur within the study area (TPWD, 2013b). Its occurrence in the study area is unlikely.

The Comal Springs dryopid beetle, a small slender insect, is highly dependent on the consistent, narrow range of habitat conditions associated with the spring-flows of the Edwards Aquifer. It is known only from Comal Springs in Landa Park, New Braunfels, Texas, with a single specimen collected from the impounded San Marcos Springs (TPWD, 2013c). The entire known range of this species is outside of the study area, and no documented occurrences of this species occur within the study area (TPWD, 2013b). Its occurrence in the study area is unlikely.

Peck's cave amphipod, a small crustacean known only to occur in the Edwards Aquifer, is similar to other subterranean amphipods in lacking eyes and pigment. It is known only from Comal Springs in Landa Park, New Braunfels, Texas, with a single specimen collected at Hueco Springs, Texas, in 1992 (TPWD, 2013c). The entire known range of this species is outside of the study area, and no documented occurrences of this species occur within the study area (TPWD, 2013b). Its occurrence in the study area is unlikely.

The fountain darter is a small fish that is known to occur only in the San Marcos and Comal River headwaters. The species prefers vegetated stream-floors, and a constant temperature for suitable habitat (TPWD, 2013c). The entire known range of this species is outside of the study area, and no documented occurrences of this species occur within the study area (TPWD, 2013b). Its occurrence in the study area is unlikely.

The Texas blind salamander is a strictly aquatic species containing very little skin pigment and lacking eyes, and occurs only in the subterranean waters of the Edwards aquifer near San Marcos.

This salamander requires clean water with a relatively constant temperature for suitable habitat (TPWD, 2013c). The entire known range of this species is outside of the study area, and no documented occurrences of this species occur within the study area (TPWD, 2013b). Its occurrence in the study area is unlikely.

The San Marcos salamander is a small, and slender aquatic salamander endemic to Spring Lake and an adjacent downstream portion of the upper San Marcos River. These salamanders inhabit algal mats in spring areas with a substrate of sand and gravel, interspersed with larger rocks and limestone boulders. The species requires clean, clear, flowing water of constant temperature for suitable habitat (TPWD, 2013c). The entire known range of this species is outside of the study area, and no documented occurrences of this species occur within the study area (TPWD, 2013b). Its occurrence in the study area is unlikely.

The jaguarundi is a secretive, small slender-bodied cat that inhabits dense thornscrub and brushland in Cameron, Hidalgo, Starr and Willacy counties (Schmidly, 2004). The jaguarundi is the least-common felid in Texas, and the current Texas population likely consists of no more than 15 individuals (Schmidly, 2004). However, FWS (2012b) noted that the last confirmed sighting of the jaguarundi in the U.S. was in April 1986 when a roadkill specimen was collected 2 miles east of Brownsville, Texas. While numerous sightings of jaguarundis have been reported since then, no subsequent sightings have been confirmed as jaguarundi (FWS, 2012b). No documented records of jaguarundis exist from within the study area (TPWD, 2013b). Its occurrence in the study area is extremely unlikely.

FWS considers the American black bear (*Ursus americanus*), as threatened due to similarity of appearance to the federally listed threatened Louisiana black bear (*Ursus americanus luteolus*). TPWD lists the American black bear as threatened. 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. While the FWS designates the American black bear as threatened because of its similarity in appearance to the threatened Louisiana black bear, FWS considers the American black bear as threatened only within the historical range of the Louisiana subspecies in east Texas and does not identify it as threatened elsewhere in Texas, including Bexar and Comal counties. Reports of black bears exist from Real, Uvalde, and Kerr counties (Taylor, 1990, 1993, 1994, 2000; McKinney, 2001) and historic records exist from the region. While the black bear may occasionally occur in the region, the species is highly unlikely to occur in the study area.

Four species in Table 3-1 are considered as federal candidate species: the Texas fatmucket (*Lampsilis bracteata*), golden orb (*Quadrula aurea*), Texas pimpleback (*Quadrula petrina*), and Sprague's pipit (*Anthus spragueii*). The three mussel species are also state-listed as threatened. While FWS does not consider the false spike mussel (*Quadrula mitchelli*) a candidate species, TPWD lists it as threatened.

Due in part to long-term deterioration of water quality and overharvesting, many rare and endemic Texas mussel species are in decline. In November 2009, 15 of these mussel species were state-listed as threatened, and in October 2011, 5 of these species were found to warrant federal listing under the ESA and are currently candidate species. The Texas fatmucket occurs in streams and rivers on sand, mud, and gravel in the San Antonio, Guadalupe, and Colorado river systems, with the Colorado River populations occurring at least as far west as Concho River tributaries in Tom Green County (Howells et al., 1996). In the past 30 years, natural and human-induced stressors have led to the dramatic decline of this species and remaining populations are at risk from scouring floods, dewatering, and poor land management (TPWD, 2009). Since 1992, the Texas fatmucket has been reduced to six known sites (possibly only four remain), including Live Oak Creek in Gillespie County (Howells, 2010). The current known range of this species is outside of the study area, and it is unlikely to occur within the study area.

The golden orb occurs in the San Antonio, Guadalupe, Colorado, Brazos, Nueces, and Frio River systems (Howells et al., 1996). The habitat is largely unreported, with individuals being found in sand and gravel in some locations and mud at others, while having an intolerance of impoundment in most instances (TPWD, 2009). The golden orb has been found alive at five sites since 1992. The golden orb is listed as a species of possible occurrence in Bexar and Comal counties (TPWD, 2013a) and, although unlikely, it may occur in the study area.

The Texas pimpleback occurs in the Guadalupe and Colorado river systems, including reports from the Llano, San Saba, and Pedernales rivers, and is found in mud and gravel, at slow flow rates (Howells et al., 1996). The only confirmed significant population in the Concho River persists but has been badly reduced by dewatering (TPWD, 2009). This species is listed as potentially occurring in Bexar County (TPWD, 2013a) and may be found within the study area in locations considered to be suitable habitat.

The false spike mussel is known from only two disjunct populations, one in the Brazos, Colorado, and Guadalupe river basins of central Texas and the other in the Rio Grande drainage (TPWD, 2009). It is found in substrates varying from mud through mixtures of sand, gravel, and cobble, with water lilies present at one study site (Wurtz, 1950). Although this species is listed as potentially occurring in Bexar and Comal counties (TPWD, 2013a), it may possibly be extirpated in Texas and, therefore, it is improbable that the species would be found within the study area.

Sprague's pipit is a relatively small passerine endemic to the North American grasslands. It has a plain buff-colored face with a large eyering. Sprague's pipit is a ground nester that breeds and winters on open grasslands. It is closely tied with native prairie habitat and breeds in the north-central United States in Minnesota, Montana, North Dakota, and South Dakota as well as south-central Canada (FWS, 2011). During migration and winter in Texas, as elsewhere, Sprague's pipit may be found searching for insects and seeds in weedy fields and the vicinity of airports as well as in a wide variety of grasslands (Oberholser, 1974). Wintering Sprague's pipits are rare to locally

uncommon in agricultural areas of north-central Texas, the Concho Valley, and the northwestern Edwards Plateau, and are rare migrants and casual winter residents through the remainder of the state (Lockwood and Freeman, 2004). This species may be found within the study area as a migrant or winter resident.

The remaining 15 taxa in Table 3-1, while not federally listed or federal candidates, are state listed as threatened. They are as follows: 2 fish, the widemouth blindcat (*Satan eurystomus*) and toothless blindcat (*Trogloglanis pattersoni*); 2 amphibians, the Cascade Caverns salamander (*Eurycea latitans*) and Comal blind salamander (*Eurycea tridentifera*); 5 reptiles, the Texas horned lizard (*Phrynosoma cornutum*), timber/canebrake rattlesnake (*Crotalus horridus*), Texas indigo snake (*Drymarchon melanurus erebennus*), Texas tortoise (*Gopherus berlandieri*), and Cagle's map turtle (*Graptemys caglei*); and 5 birds, the wood stork (*Mycteria americana*), white-faced ibis (*Plegadis chihi*), bald eagle (*Haliaeetus leucocephalus*), zone-tailed hawk (*Buteo albonotatus*), and peregrine falcon (*Falco peregrinus*).

The widemouth blindcat and toothless blindcat are troglobitic catfish, endemic to the San Antonio pool of the Edwards Aquifer. They have been recorded only from Bexar County, but outside of the study area (TPWD, 2013b). Neither of these fish is likely to occur in the study area.

The Cascade Caverns salamander is a subaquatic salamander endemic to caves and springs associated with the Edwards Aquifer in Comal, Kendall, and Kerr counties (Chippindale et al., 2000). Smith and Potter (1946) first described the species from the Cascade Caverns system near Boerne, where they assumed it endemic; however, additional specimens from other localities may represent this species. According to Dixon (2000), the species is restricted to the type locality in Kendall County, but this species is not well understood and populations of *Eurycea* salamanders occurring in several other springs and cave systems in Kendall, Kerr, western Comal, and southwestern Hays counties may also represent this species (Chippindale et al., 2000). Documented occurrences of this species from 1964 and 1973 occur within the south-central portion of the study area (TPWD, 2013b), and although unlikely, it may still occur within the study area in suitable habitat.

The Comal blind salamander is a subaquatic species endemic to several caves and springs associated with the Edwards Aquifer in western Comal and northern Bexar counties (Chippindale et al., 2000). According to Chippindale et al. (2000), the species occurs only in Elm Springs Cave, Bexar County, and Honey Creek Cave and nearby limestone caves and sinkholes in the floodplain of Cibolo Creek in Comal County. A documented occurrence of this species from 1993 occurs within the northern portion of the study area (TPWD, 2013b), and may still occur within the study area in suitable habitat.

The Texas horned lizard is found throughout the state in a variety of habitats, but prefers arid and semi-arid habitats in sandy loam or loamy sand soils that support patchy bunchgrasses, cacti, yucca, and various shrubs (Henke and Fair, 1998). Historically this species has been recorded from throughout Texas, but over the past 30 years, it has almost vanished from the eastern half of the

state, although it still maintains relatively stable numbers in west Texas. The Texas horned lizard has been recorded from Bexar and Comal counties (Dixon, 2000) and may occur in small numbers in suitable habitat within the study area.

The timber 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; TPWD, 2013a). 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). While the timber rattlesnake has been recorded in Bexar County (Dixon, 2000), this record represents the western edge of its range. It is unlikely to occur in the study area.

The Texas indigo snake is a large nonvenomous snake that inhabits thornbush-chaparral woodlands of south Texas. The species is drought-sensitive and requires moist microhabitats such as riparian corridors, ponds, resacas, and windmill seeps (Werler and Dixon, 2000). Primarily a Mexican species, the Texas indigo snake ranges throughout south Texas, north to Val Verde, Kinney, Uvalde, and Medina counties (Dixon, 2000; Werler and Dixon, 2000). According to Dixon (2000), Bexar County represents the northern edge of this species' range, and while Werler and Dixon (2000) noted that the species historically occurred in Bexar County, no documented records exist since the early 1950s. The Texas indigo snake is unlikely to occur in the study area.

The Texas tortoise inhabits sandy open scrub, semidesert, and desert habitats of south Texas (Bartlett and Bartlett, 1999). It is primarily vegetarian, feeding on a variety of plant matter including leaves, fruits, flowers, cactus pads, and stems. During periods of inactivity, Texas tortoises typically burrow in shallow depressions found at the bases of clumps of bushes or cacti, but may occasionally be found in underground burrows or under objects. The species is most active from March to November, with breeding taking place from April to November (Garret and Barker, 1987; TPWD, 2013a). The study area is at the northern edge of this tortoise's range, and records exist from Bexar and Comal counties (Dixon, 2000). The Texas tortoise is of potential though unlikely occurrence in the study area.

Cagle's map turtle, an aquatic riverine species, is restricted to the Guadalupe River drainage in central southeastern Texas. This turtle, which is not known to migrate over land, is most likely found where the current is moderately or relatively slow, and where basking snags are plentiful (Bartlett and Bartlett, 1999). Records of Cagle's map turtle exist from Bexar and Comal counties (Dixon, 2000). Cagle's map turtle is of potential though unlikely occurrence in the study area.

None of the five state-listed birds is likely to occur in the study area other than as occasional, vagrant or migrating individuals. The wood stork is listed by the FWS as endangered in Florida, Georgia, North Carolina, and South Carolina, but not Texas. It is, however, state listed as threatened. This species 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). While migrant wood storks have been documented in Bexar County (Oberholser, 1974), this species is unlikely to occur in the study area due to lack of suitable habitat.

The white-faced ibis is a medium-sized wading bird that inhabits freshwater marshes, sloughs, and irrigated rice fields, but may occur in brackish and saltwater habitats. White-faced ibis are permanent residents along the Texas Gulf Coast; however, nesting records exist for many scattered inland localities including Bexar County (Oberholser, 1974; Lockwood and Freeman, 2004). The species is a rare to uncommon migrant throughout the state and may occasionally be found as a postbreeding visitor north and west of its typical range. While records of the white-faced ibis exist from Bexar County (Oberholser, 1974), it is unlikely to occur in the study area due to lack of suitable habitat.

The bald eagle is present year-round in Texas and may be found breeding, wintering, and during migration. In Texas, bald eagles breed along the gulf coast and on major inland lakes and reservoirs. Additional numbers of bald eagles winter in these habitats. Bald eagles prefer large bodies of water surrounded by tall trees or cliffs, which they use as nesting sites. In 2007, the FWS removed the bald eagle from the list of endangered and threatened wildlife (72 FR 130 37345–37372, July 9, 2007); however, the bald eagle still receives federal protection under provisions of the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA). According to TPWD (2013b), no documented bald eagle nests occur in the study area; however, bald eagles may traverse the study area during the months of November through March during migration.

The zone-tailed hawk is a mesa- and canyon-inhabiting raptor in Arizona, New Mexico, and southwest Texas. In Texas, it is an uncommon local summer resident in the mountains of the central Trans-Pecos, east through the southern Edwards Plateau (Lockwood and Freeman, 2004). Lockwood (2001) identifies zone-tailed hawks as uncommon summer residents in the southwestern and southern portions of the Edwards Plateau, east to Bandera County. This hawk has been recorded from Bexar County (Oberholser, 1974) and could occasionally occur in the study area, although it would not be expected to nest there.

TPWD recently revised the status of the American peregrine falcon (*Falco peregrinus anatum*) from endangered to threatened, and dropped the Arctic peregrine falcon (*Falco peregrinus tundrius*) from the state-threatened and endangered list altogether. The American peregrine falcon is a rare migrant statewide and nests in the mountains of Trans-Pecos Texas, while the Arctic peregrine falcon is an uncommon migrant statewide and an uncommon winter resident on the coastal prairies and coast, where it typically occurs near bays and estuaries (Lockwood and Freeman, 2004). However, because the two subspecies are not easily distinguishable from each other in the field, TPWD will only reference to the species level (TPWD, 2013a). While Oberholser (1974) lists a historical breeding record from as close as Kerr County, no recent breeding records exist from Bexar County or Comal County (Lockwood, 2001; TPWD, 2013b); however, peregrine falcons may

migrate through the study area during spring and/or fall and may forage in appropriate habitat during the winter.

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.

While critical habitat has been designated for seven of the endangered karst invertebrate species in Bexar County, none of this habitat occurs in the study area. As a result of the management plans already in place, critical habitat was not designated for two of the nine listed karst invertebrates, the Government Canyon Bat Cave meshweaver and Government Canyon Bat Cave spider (68 FR 17156–17231, April 8, 2003). Critical Habitat Unit 13 (Black Cat Cave), which provides protection for *Rhadine exilis*, is located approximately 0.5 mile south of the study area near the intersection of Bulverde Road and Ridgeway Drive. None of the critical habitat units proposed on February 22, 2011, occur within the study area (76 FR 9872–9937).

3.6 SOCIOECONOMICS

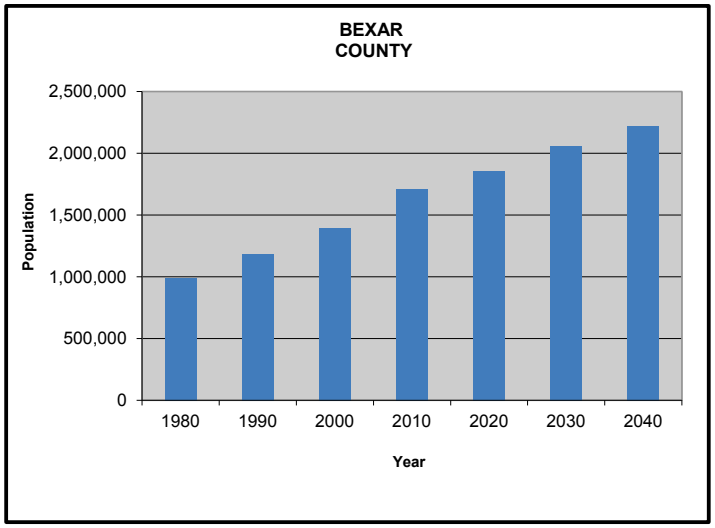
This section presents a summary of economic and demographic characteristics of the study area and provides a brief description of the socioeconomic environment of the region. Reviewed literature sources include publications of the U.S. Census Bureau, the U.S. Bureau of Labor Statistics (BLS), the Texas Workforce Commission (TWC), and the TWDB.

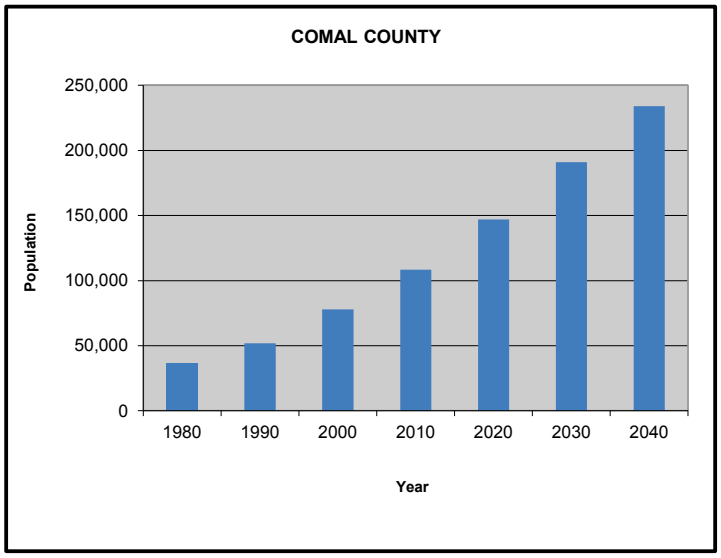
3.6.1 Population Trends

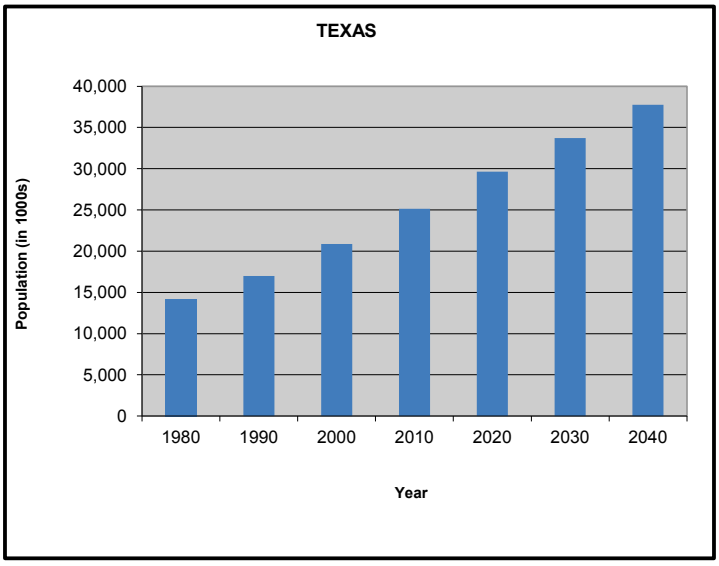
As shown on Figure 3-4, historical data indicate that the populations of Bexar County and Comal County have increased substantially over the past three decades. Bexar County's population increased 20% and 18% during the 1980s and 1990s, respectively, and increased by over 23% between 2000 and 2010. The county's population was recorded at 1,714,773 in 2010. Comal County's population grew at a much higher rate over the same time span. Comal County grew by 42% in the 1980s, by 51% during the 1990s, and by 39% in the 2000s. The U.S. Census Bureau estimated Comal County's 2010 population at 108,472 persons. By comparison, population growth at the state level increased approximately 19% and 23% during the 1980s and 1990s, respectively, and by 34% between 2000 and 2010 (U.S. Census Bureau, 1983, 1990, 2000, 2011).

FIGURE 3-4

POPULATION TRENDS AND PROJECTIONS







Source: U.S. Census Bureau (1983, 1990, 2000, 2011); TWDB (2011).

Population forecasts provided by TWDB indicate that Bexar County, Comal County, and the state all will continue to experience strong growth through 2040 (see Figure 3-4). Bexar County is projected to grow by approximately 30% between 2010 and 2040 and reach a population of 2,222,887 in 2040. Comal County is projected to increase 116% to reach a population of 233,964 in 2040. By comparison, the state is expected to grow by approximately 50% in the same time period, to a population of 37,734,422 (TWDB, 2011).

3.6.2 Employment

As shown on Figure 3-5, the labor force at the county and state levels has increased steadily with the corresponding population increases in the last few decades. During the 33-year period between 1980 and June 2013 (the most recent labor force data available), the labor force within Bexar County, Comal County, and the State of Texas increased by approximately 86%, 255%, and 90%, respectively (BLS, 2013).

Unemployment rates for Bexar County and Comal County have fluctuated over the last few decades (see Figure 3-5). In 1980, unemployment rates in Bexar County (5.1%) were slightly lower than the state's (5.2%), but Comal County stood only at 2.9% unemployment. In 1990, Bexar County (7.4%) had a higher unemployment rate than the state (6.4%), with Comal County having an unemployment rate of 5.4%. By 2000, Bexar County's (4.1%) unemployment rate was again better than that of the state (4.4%), with Comal County at 3.6% unemployment. In 2010, in the midst of recession, Bexar County (7.5%) was again better than the state as a whole (8.2%), but Comal County remained lower at 6.9% unemployment. In June 2013, the most recent data available, Bexar County had a rate of 6.7% unemployment, the State of Texas had a rate of 6.9%, and Comal County had an unemployment rate of 7.2% (BLS, 2013).

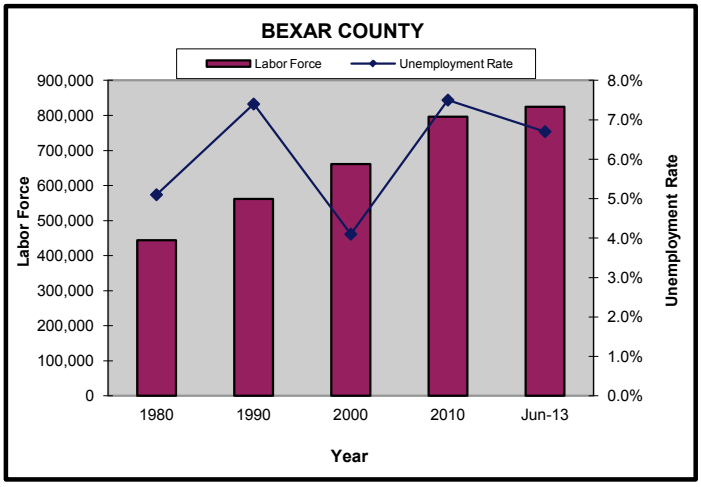
Covered employment data incorporate jobs that are located in the county and include workers covered by state unemployment insurance and most agricultural employees. The data exclude employment covered by the Railroad Retirement Act, self-employed persons, and unpaid family workers. A comparison of first-quarter TWC employment figures for 2008 and 2013 shows that covered employment within Bexar County increased approximately 5.1%, from 721,673 to 758,592. In Comal County, covered employment rose 9.5%, from 37,794 jobs to 41,373 jobs within the 4-year period. By comparison, covered employment within the state increased approximately 4.7%, from 10,355,782 to 10,843,393 (TWC, 2013).

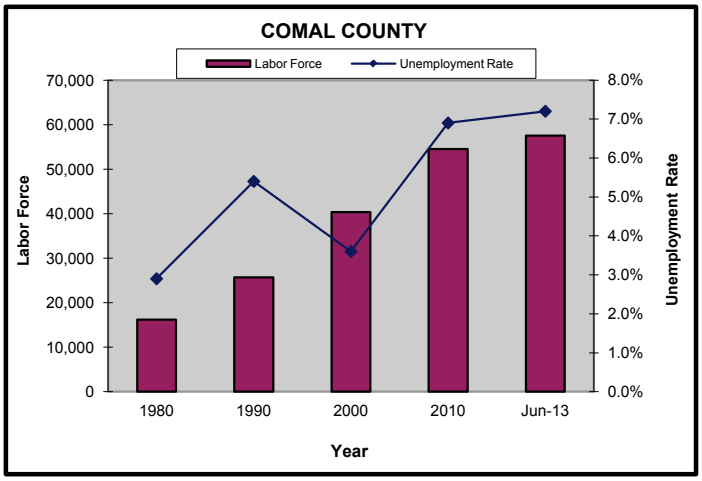
3.6.3 Leading Economic Sectors

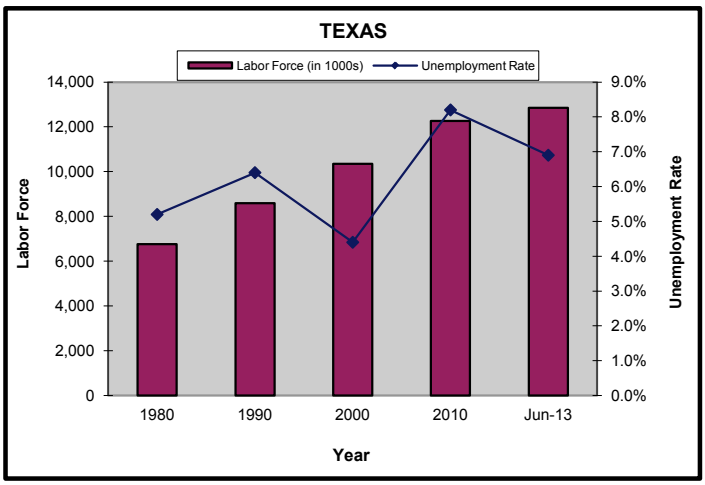
Information for leading employment sectors within Bexar and Comal counties is reported by TWC and shown on Figure 3-6. In the first quarter of 2013, the leading employment sectors within Bexar County included the government sector (18%), the trade, transportation, and utilities sector (16%), and the education and health services sector (15%). The leading first quarter 2013 employment sectors for Comal County are the trade, transportation and utilities sector (27%), the leisure and

FIGURE 3-5

CIVILIAN LABOR FORCE AND UNEMPLOYMENT

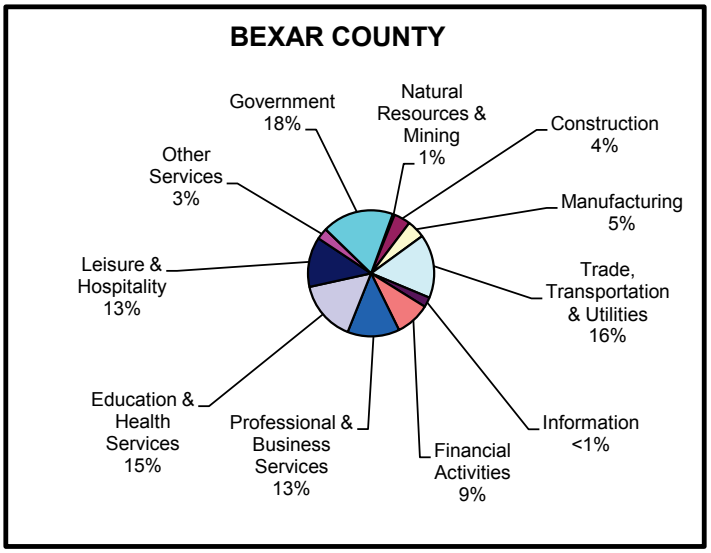


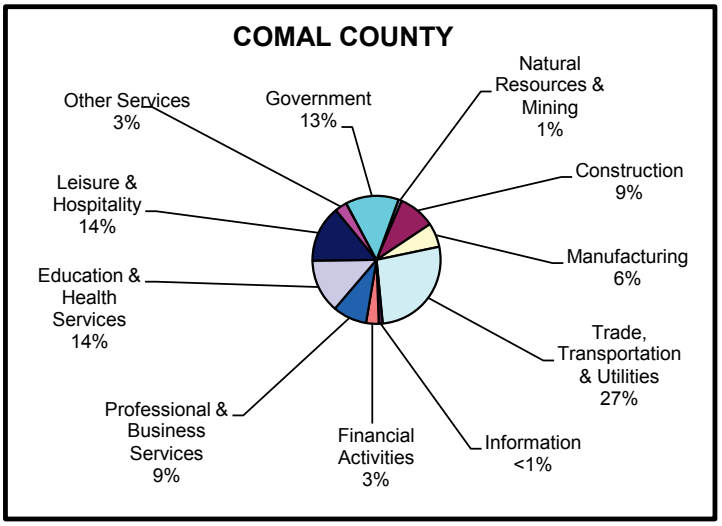


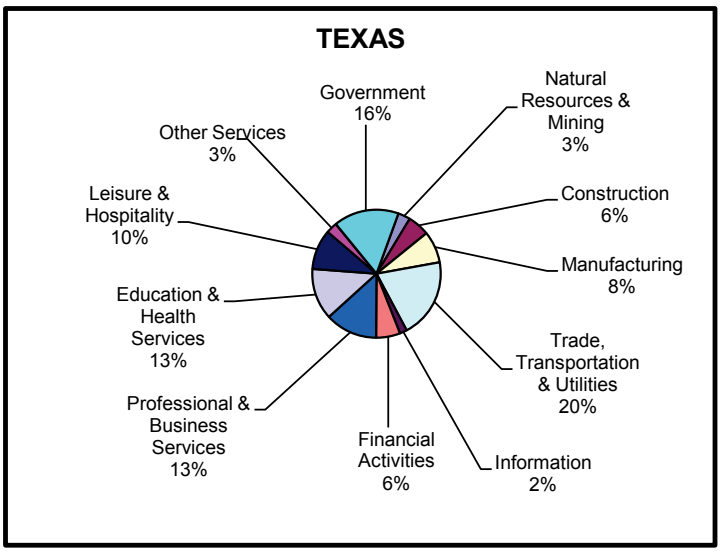


Source: U.S. Census Bureau (1983); BLS (2013).

FIGURE 3-6
COVERED EMPLOYMENT AND MAJOR EMPLOYMENT SECTORS
1st QUARTER 2013







Source: TWC (2013).

hospitality sector, and education and health services sector (both 14%), and the government sector (13%). The State of Texas lists the top four employment sectors as being the trade, transportation and utilities sector (20%), the government sector (16%), the education and health services sector (13%), and the professional and business services sector (also 13%) (TWC, 2013).

3.7 HUMAN DEVELOPMENT

3.7.1 Land Use

The study area is located north of San Antonio within portions of both Bexar County and Comal County, which are located in State Planning Region No. 18 and represented by the Alamo Area Council of Governments (AACOG), with headquarters in San Antonio (AACOG, 2013). Some extreme northern portions of the City of San Antonio are located within the southern portion of the study area as well. According to the last set of published NRCS land use estimates (NRCS, 2000), the three primary classifications in Bexar County were rangeland (29%), urban (28%), and cropland (23%). In Comal County, the three primary land use classifications were rangeland (72%), urban (11%), and pastureland (7%). During the decade since these estimates were made, the percentage of urban development has undoubtedly grown at the expense of the two agricultural categories.

As San Antonio has grown over the past decade, the western and northern portions of the city have experienced a tremendous amount of development, particularly along the corridors of Interstate Highway 10 (I-10), Loop 1604, State Highway (SH) 16, US 281, and SH 151. Subsequent commitments by the city, county, and state to upgrade roads, highways, railroads, and other infrastructure in the area will continue to stimulate new commercial, industrial, and residential development throughout the region.

Between 2001 and 2011, approximately 97,000 single-family building permits were recorded within the San Antonio Metropolitan Statistical Area (MSA). In 2001, the San Antonio MSA recorded 9,138 single-family building permits, with an average price per dwelling of $93,200. In 2011, the San Antonio MSA recorded 4,117 single-family building permits, with an average price per dwelling of $185,100. By comparison, in 2001 Bexar County recorded 7,462 single-family building permits, with an average price of $85,200, and in 2011 it recorded 2,442 single-family building permits with an average price of $176,500. Comal County recorded 1,172 single-family building permits in 2001 with an average price of $129,200, and in 2011 it recorded 1,016 permits with an average value of $190,100 (Texas A&M University [TAMU], 2012).

The study area has recently experienced intense development within the last few years, and consists of a mixture of commercial and residential uses. Large commercial complexes line the border of US 281, including The Shoppes at Wilderness Oaks and several large shopping centers near the intersection of US 281 and TPC Parkway. A small mining pit is also located along the western edge of US 281, just south of Bulverde Road (FM 1863). The site is 13.66 acres, with 9.60 acres of the site used for the mining, screening, crushing, and removing of gravel. However,

this former quarry is currently being filled, and the land may potentially be reclaimed completely by the end of 2013 (TCEQ, 2008; Stevens Trucking Inc., 2013).

Large residential developments are located primarily in the western half of the study area, adjacent to the US 281 corridor, and in the north-central portion of the study area, associated with the City of Bulverde and the Oak Village North Property Owner's Association.

Two school districts operate schools located within the study area boundaries. Comal Independent School District (ISD) runs Johnson Ranch Elementary and M.H. Specht Elementary, while North East ISD operates an additional five schools within the study area: Roan Forest Elementary, Tuscany Heights Elementary, Cibolo Green Elementary, Frank Tejeda Middle, and Claudia Taylor Johnson High (Texas Education Agency, 2013). Additionally, one private school, Primrose School at Cibolo Canyons, was found within the study area boundaries.

3.7.2 Parks and Recreation

A review of the TPWD website (TPWD, 2013d), National Park Service website (NPS, 2013), the FWS NWR System (FWS, 2013b), the Texas Land Conservancy website (TLC, 2013), Nature Conservancy website (Nature Conservancy, 2013), federal, state, and local maps, and field surveys revealed several recreational areas within the study area. The JW Marriott San Antonio Hill Country Resort & Spa/TPC Golf Course is located in the south-central portion of the study area. This 2,855-acre resort features 36 holes of golf, a hotel and conference center, and abuts a 750-acre bird sanctuary set aside for the golden-cheeked warbler. The Natural Bridge Caverns and Wildlife Ranch, located in the eastern portion of the study area off FM 3009, features over 400 acres with roaming African animals for visitors to view and feed during a drive-through safari, and also features a restaurant and petting zoo. Additionally, many playgrounds, ball fields, tennis courts, swimming pools, and other small recreational facilities are scattered throughout the study area. Although it is likely that no hunting occurs within the study area boundaries, seasonal fishing along Cibolo Creek is possible. According to TPWD (2013e), the following species of fish have been caught in Cibolo Creek: largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), channel catfish (*Ictalurus punctatus*), Rio Grande cichlid (*Cichlasoma cyanoguttatum*), longnose gar (*Lepisosteus osseus*), green sunfish (*Lepomis cyanellus*), redbreast sunfish (*Lepomis auritus*), and redear sunfish (*Lepomis microlophus*).

3.7.3 Agriculture

The study area is located in a portion of San Antonio that is quickly being converted to residential and commercial development. Historically, ranching was the predominant land use in Bexar and Comal counties; however, the acreage dedicated to farming and ranching operations continues to decrease as farms and ranches are subdivided for residential and commercial development. As shown in estimates published by the U.S. Department of Agriculture (USDA), the total land area in farms in Bexar County between 2002 and 2007 decreased from 441,206 acres in 2002 to

425,909 acres in 2007, a 3% decrease. The total land area in farms in Comal County between 2002 and 2007 decreased from 203,291 acres in 2002 to 192,454 acres in 2007, a 5% decrease (USDA, 2007). The portions of Bexar and Comal counties that comprise the study area are part of the Edwards Plateau, and the rugged nature of the terrain prevents extensive agriculture that is possible in other parts of these counties. It is unlikely that agricultural land uses occur within the study area boundaries, although some small farming operations may exist in isolated pockets. Additionally, small cattle operations might exist in the northern portion of the study area, in the pastures adjacent to Cibolo Creek.

3.7.4 Transportation/Aviation/Communications Facilities

The major transportation features within the study area are US 281 and FM 1863. US 281 runs 580 miles within Texas in a north-south direction, from the Oklahoma-Texas state line near Wichita Falls, down to the U.S.-Mexico international border at Reynosa, Mexico. US 281 is located in the western portion of the study area and runs roughly parallel to its western boundary. FM 1863 runs for approximately 17 miles, from US 281 eastward to SH 46 near New Braunfels. FM 1863 is located in the northern portion of the study area and runs west to east, just north of the Comal-Bexar county line. Other major roadways within the study area include Bulverde Road and Smithson Valley Road (TxDOT, 2013a).

A review of the Airport/Facility Directory for the South Central U.S. (Federal Aviation Administration [FAA], 2013), the San Antonio Sectional Aeronautical Chart (FAA, 2012), the Texas Airport Directory (TxDOT, 2013b), and the AirNav website (AirNav, 2013) found one FAA-registered airport and one private airstrip within the study area. The Bulverde Airpark, located in the northwest portion of the study area near the intersection of US 281 and FM 1863, is an airport open to the public with one asphalt runway measuring 2,890 x 40 ft. The Flying J Airport, located in the northeast portion of the study area just north of the Comal-Bexar county line, is a privately owned airstrip with one dirt runway measuring 1,700 x 80 ft.

A search of the Federal Communications Commission (FCC) website revealed no AM towers within the study area; however, one FM tower and two TV towers were found within the study area boundaries (FCC, 2013). The FM tower is located on the west side of US 281, roughly halfway between Stone Oak Parkway and Overlook Parkway. The two TV towers are both located in a cluster on the east side of US 281, just north of the intersection of US 281 and Overlook Parkway. Additionally, an online search and a field visit conducted by Atkins staff located seven cellular communications towers within the study area. Many of these towers are located along the US 281 corridor, but towers are scattered throughout the study area as a whole (Mobiledia, 2013).

3.8 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. Although CPS Energy is exempt from this code, the

CPS Energy model for transmission line evaluation closely mirrors PUC guidelines. The term "aesthetics" refers to the subjective perception of natural beauty in the landscape and attempts to define and measure an area's scenic qualities.

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

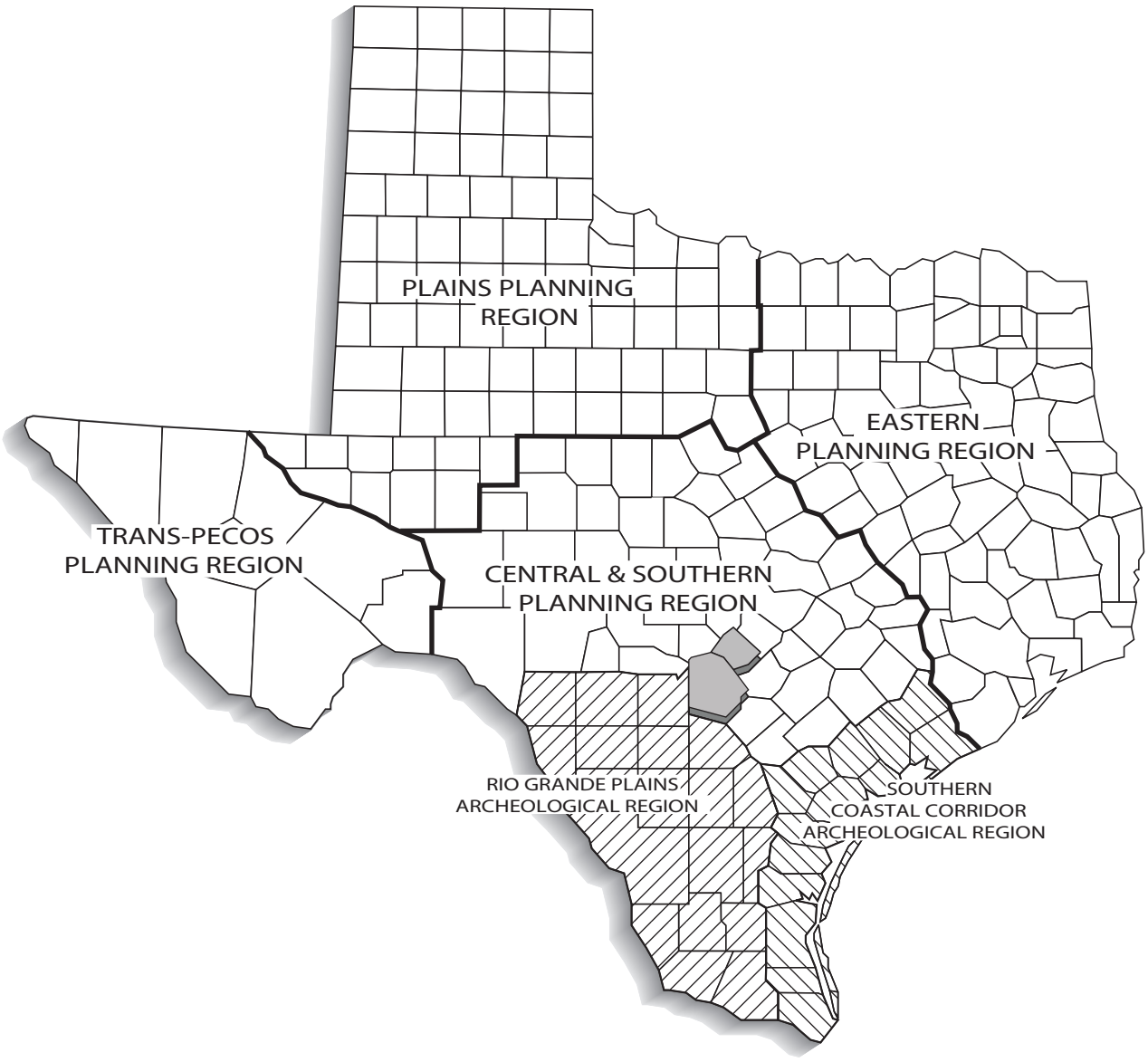
- topographical variation (hills, valleys, etc.)
- prominence of water in the landscape
- vegetation variety (forests, pasture, etc.)
- diversity of scenic elements
- degree of human development or alteration
- overall uniqueness of the scenic environment compared to the larger region

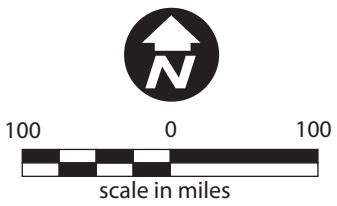
Based on these criteria, the study area exhibits a medium to high degree of aesthetic quality for the region. The area is characterized by a relatively hilly topography, and some water features occur within the study area. Cibolo Creek and some associated tributaries are the only water features within the study area. However, Cibolo Creek is a somewhat major waterway, acting as a dividing line between Bexar and Comal counties and running 96 miles from Turkey Knob near Boerne to its confluence with the San Antonio River in Karnes County. Furthermore, the landscape has experienced a medium degree of alteration due to residential, industrial, and commercial development, as well as major transportation corridors. As a result, the landscape exhibits a generally medium level of human impact, including highways, residential subdivisions, a few major recreational land use conversions such as golf courses, electric communication towers, and existing electrical transmission and distribution lines.

In 1998, TxDOT published a list of some of the best scenic overlooks and rest areas in Texas, each of which presented particularly strong aesthetic views or settings (TxDOT, 1998). A review of this list found that none of the 46 locations listed occurs within the study area.

3.9 CULTURAL RESOURCES

The study area encompasses portions of two central Texas counties: Comal and Bexar. These counties are located in the southern portion of the Central Texas Archeological Region of the Central and Southern Planning Region as defined by the Texas Historical Commission (Mercado-Allinger et al., 1996) and shown on Figure 3-7. The cultural developments in the Central and Southern Planning Region are classified by archeologists according to four primary chronological and developmental stages: Paleoindian, Archaic, Late Prehistoric, and Historic. These classifications have been defined primarily by changes in material culture over time, as evidenced through information and artifacts recovered from archeological sites.





Source: Mercado-Allinger, et al. (1996)

ATKINS

Figure 3-7

LOCATION OF BEXAR AND COMAL COUNTIES IN RELATION TO THE CULTURAL RESOURCES PLANNING REGIONS OF TEXAS

File: N:\Clients\C_D\CPS_Energy\100032882\geo\figs\figure3-7.ai

3.9.1 Cultural Overview

3.9.1.1 Prehistoric

The Paleoindian period, representing the earliest occupations in the region, began before 10,000 B.C. and continued to about 6500 B.C. The Paleoindian people were hunters and gatherers who hunted now-extinct species of Pleistocene megafauna such as the mammoth, mastodon, camel, and bison. In most areas, however, big-game hunting was probably augmented by the utilization of wild plants and smaller animals (Black, 1989). Data collected during excavations at the St. Mary's Hall site (41BX229) have contributed to this view of a more-varied diet for Paleoindian groups (Hester, 1978).

Few intact Paleoindian sites have been recorded in this region, partly because Paleoindian deposits can be deeply buried in various alluvial settings making them difficult to locate and study. When Paleoindian sites are found they are usually poorly preserved or stratigraphically mixed (Mercado-Allinger et al., 1996). Sites occur more commonly as small, surface lithic scatters, usually located in upland areas along divides of major and minor watersheds. These are thought to represent transient camps, resource procurement loci, or retooling stations by loosely structured, highly mobile social groups composed of several nuclear families referred to as bands. However, Paleoindian sites with buried components have been excavated in the Central Texas region. These include the Kincaid Rockshelter site (41UV2) in Uvalde County (Collins et al., 1988), the Levi site (41TV49) in Travis County (Alexander, 1963), the Wilson-Leonard site (41WM235) in Williamson County (Collins, 1993), and the Pavo Real site 41BX52 (Henderson, 1980), which yielded one of the few known Paleoindian burials. Late Paleoindian components have also been found during excavations at site 41BX47 on Leon Creek (Tennis, 1996) as well as the Richard Beene site (41BX831) (Thoms et al., 2005). Temporally diagnostic tool kits associated with the Paleoindian period consist of a variety of finely chipped, sometimes fluted, lanceolate projectile points, such as the Clovis, Folsom, and Plainview types (Willey, 1966).

At the end of the Paleoindian period, the archeological record exhibits evidence of a diversification in subsistence patterns that mark the beginning of the complex chronological period referred to as the Archaic. Indications suggest that the prehistoric inhabitants began hunting a variety of small game animals including deer and rabbit, as well as gathering edible roots, nuts, and fruits (Black, 1989). Site types include rock shelter, camp sites, lookout sites, and quarry sites that are usually located near a reliable water source. Many constructs have been used to classify the developmental sequences of the Central Texas Archaic and can be found in Kelley (1947), Johnson et al. (1962), Weir (1976), and Prewitt (1981). The Archaic period is divided into three subperiods: Early, Middle, and Late.

The Early Archaic groups continue to exhibit many of the characteristics of the preceding Paleoindian period and the early part of this period is sometimes referred to as transitional between the Paleoindian and the Archaic periods. Most of the projectile points from this period are

well made and many exhibit characteristics typical of Paleoindian technologies, such as lateral edge grinding. In addition, Early Archaic artifact forms have been recovered beyond the boundaries of central Texas. The variety of projectile point types distributed over such a large area has prompted Prewitt (1981) to suggest that these people were organized in small, dispersed bands that roamed broad territories. In Bexar County, Early Archaic components have been identified at the Housman Road site (41BX47), the Richard Beene site (Nickels, 2011), and the Panther Springs site (41BX228) (McNatt et al., 2000).

The Middle Archaic period can be subdivided into early (Clear Fork) and late (Round Rock) intervals. Nolan and Travis projectile points are indicative of the Clear Fork interval, while the Round Rock interval is marked by the Pedernales and Langtry points. It was during the Middle Archaic period that burned rock middens became a specialized site type (Black, 1989). This site type becomes extremely common during this period, suggesting an intense and perhaps rather specialized plant-processing economy. Weir (1976) has even suggested a population increase during this period and possible developments in social organization. Projectile points from this period are quite numerous, occurring in large frequencies at some sites. They tend to be large, straight-stemmed, and often not as well made as the points from earlier or later periods. Middle Archaic sites in Bexar County include the Granberg II site (41BX271) and Elm Waterhole site (41BX300) (McNatt et al, 2000).

By the beginning of the Late Archaic period, a proliferation of projectile point types again occurred and the frequency of burned rock middens appears to have decreased. Prewitt has suggested that proliferation of projectile points during the earliest phase of this subperiod may represent a return to the Early Archaic pattern of small, dispersed bands with wide-ranging territorial areas. The latter part of this period appears to be marked by an emphasis on the utilization of a wide variety of food resources, perhaps indicative of population or climatic stress at this time. Projectile points diagnostic of the early part of the Late Archaic include Bulverde and Pedernales types. Later in the period Ensor, Frio, and Mahomet point types became prominent. Cemeteries, especially associated with rockshelters, also become common in central Texas during the Late Archaic (Dockall et al., 2006).

The Late Prehistoric period (A.D. 800–1600) is much shorter in duration than the Archaic period and is divided into two phases based upon radio carbon dates and changes in arrow types and subsistence pursuits. The first phase of this period, the Austin Phase, dates to between A.D. 800 and 1300, and is manifested by Scallorn points and burned rock middens. During the second phase identified for the Late Prehistoric, the Toyah phase, indications exist of major population movements, changes in settlement patterns, and perhaps lower population densities (Black, 1989). The first evidence of incipient agriculture appears at this time, as do ceramics. Bison hunting appears to be a very important subsistence strategy during the Toyah phase. The Toyah phase has very distinctive traits that separate it from the earlier Austin phase. Temporal indicators of the Toyah phase include ceramics, both locally made and imported, Perdiz arrow points, end scrapers, large thin bifaces, beveled knives, and prismatic blades (Rogers and Russell, 2007). While the

hunting of bison was an important subsistence endeavor, deer, antelope, and other smaller mammals were also exploited. The use of burned rock middens was not great during this time; rather, large hearths were used for cooking (Johnson, 1994).

The Late Prehistoric period also is marked by the introduction of several technological advances, most notably the bow and arrow and, later, pottery. The bow and arrow quickly became the standard weapon, replacing the throwing stick, or atlatl, and small thin arrow points became a key indicator among the material remains of the period. Sometime after the adoption of the bow and arrow, plainware ceramics were introduced into the area. This development probably came from agricultural groups to the east or northeast. Possible indications exist of major population movements, changes in settlement patterns and, perhaps, lower population densities during the Late Prehistoric period (Black, 1989).

3.9.1.2 Historic

Historic Indian groups in the area include the Tonkawa, Karankawa, Lipan Apache, and Comanche, who entered the area from the plains in pursuit of food and stopped at the areas springs. The Spanish were likely the first Europeans in the study area, perhaps as early as 1690, when Alonso De Leon reputably passed through on his way to East Texas (Anonymous, 2012). In 1691, the first Spanish Provincial Governor of Coahuila, Domingo Terán de los Ríos, travelled through portions of Bexar and Comal counties laying the path for El Camino Real de los Tejas (The King's Highway, also known as the Old San Antonio Road in portions), which extended into many other counties and ran for about 2,500 miles (Long, 2013).

E1 Camino Real de los Tejas was, at the time, the principal road connecting Coahuila, Mexico, with the former Spanish capital of the Texas province, Los Adaes (now Robelene, Louisiana). Spanish military forces used the route to counter French expeditions into what is now Texas as early as the mid-1680s. The Frenchman Louis Juchereau de St. Denis may have also traveled through Bexar and Comal counties in 1714 as he traveled from Natchitoches to San Juan Bautista on the Rio Grande (Pool, 1975). Other expeditions to Bexar County and the Comal River include the Espinosa, Olivares and Aguirre expedition (1709 and 1716), the Rámon expedition (1716), the Alarcón expedition (1718), the Aguayo expedition (1721), and the Rivera expedition (1727) (Long, 2013; Nickels, 2011). By the mid-eighteenth century, under the perceived threat of French encroachment into territories claimed by the Spanish Crown, Spanish friars and soldiers entered the central Texas area and established several missions, including the short-lived Nuestra Senora de Guadalupe Mission on Comal Springs. The El Camino Real de los Tejas continued to see use through the nineteenth century, serving as an important transportation corridor for soldiers, merchants, and settlers alike.

In 1731, Canary Islanders founded the Villa de San Fernando de Bexar, which became the first municipality in the Spanish province of Texas. During these years, epidemics devastated large numbers of the missions' native populations, and Apache raids were reportedly responsible for almost all of the reported Spanish deaths (Long, 2013).

After the arrival of the first Anglo-American colonists in 1821, San Antonio (San Fernando de Bexar) became the westernmost settlement in Texas. In 1824, Texas and Coahuila were united into a single state with the capital at Saltillo. A Department of Bexar was formed with a political chief who had authority over the Texas portion of the state, and the Department of Bexar extended from the Rio Grande to the Texas Panhandle and west to El Paso. When Texas gained its independence from Mexico in 1836, Bexar County was created (Long, 2013).

During this same time (1825), Juan M. Veramendi received a Mexican land grant for the area around Comal Springs. However, permanent settlement in Comal County did not begin until 1845 when Prince Carl of Solms-Braunfels secured title to a portion of the Veramendi grant. German and American immigrants settled the area rapidly and shortly thereafter, in 1846, Comal County was formed with New Braunfels as the County Seat. Early on the county supported both farming (especially corn) and ranching industries. By the early 1920s, the county had also become a center of manufacturing and shipping. During the Mexican Revolution in the early twentieth century, Mexican immigrants began settling in the area (both Comal and Guadalupe counties) in significant numbers. Its location along IH35 between San Antonio and Austin and later with the creation of Canyon Lake allows Comal County to capitalize on its many natural and historic resources as well as its German heritage to support a large tourism industry (Greene, 2013).

Within the study area, in 1850, the Pieper Settlement was established in what would later become Bulverde (named after a local landowner – August Pieper who arrived in Texas with the Prince of Solms Colony). At least four historic farms and ranches dating from around the founding of Bulverde have been identified as potentially eligible for listing in the National Register of Historic Places (NRHP) including the August and Johanna Kramm Pieper House (1850s), Victor Hanz House and Cabin (1850/1890), Charles Staudt House and Ranch (1865), and the Ludwig Vogel Ranch (1860) and are believed to be within the current study area (Dase et al., 2010). Representative of a number of the early homesteads, the Wilhelm Weidner homestead (1873–1875) within the current study area is designated as a Recorded Texas Historic Landmark. Like other early homes in the area, the homestead was built along Cibolo Creek in what was known as Vogel's Valley. With a population of only 25 in the 1960s, the area remained largely rural until the recent encroachment of surrounding cities (Haas, 2013a). Like Bulverde, Smithson Valley was settled in the mid-1850s and named for a local landowner. However, unlike Bulverde, Smithson Valley developed early as a supply and social center for the surrounding local farmers and ranchers, eventually including a cotton gin, amusement hall, store, and saloon. Today the area is increasingly suburban due to the influx of residents from the San Antonio area (Haas, 2013b).

3.9.2 Previous Investigations

Early contributions to the archeology of Central Texas were made by the work of J.E. Pearce (1919, 1932), E.B. Sayles (1935), and C.N. Ray (1929, 1930, 1934). Their work aided in developing an understanding of cultural areas and chronological sequences in the state. In the 1930s, excavations undertaken by the Works Progress Administration (WPA) provided new sources of data for

developing chronologies in many parts of Texas. Much of this effort was concentrated north and east of San Antonio (Jackson, 1938; Campbell, 1962).

Among the most important early syntheses of the central Texas region was the work of J. Charles Kelley (1947, 1959), whose chronological subdivisions formed the basis for more recent systematizations (Weir, 1976; Prewitt, 1981). The River Basins Surveys in central Texas provided new data on the chronological sequence of cultures in this area (Stephenson, 1947).

The growing body of archeological data from the WPA and the River Basins Surveys prompted the publication of the *Handbook of Texas Archeology* (Suhm et al., 1954), the first and, perhaps, still the most comprehensive synthesis of the archeology of Texas. Much work was conducted in many parts of Texas during the 1960s. Among the most notable studies were those of Johnson et al. (1962) at sites in Canyon Lake near New Braunfels; Jelks (1962) at the Kyle site at Lake Whitney; Shafer (1963) at the Youngsport site in Bell County; and Sorrow et al. (1967) at Stillhouse Hollow Lake near Belton. Farther west, in the Lower Pecos region, archeological excavations in the Amistad Lake area (Johnson, 1964; Sorrow, 1968; Dibble and Lorrain, 1968; Collins, 1969) provided important chronological and paleoecological data.

Various major survey and excavation projects undertaken during the late 1970s and early 1980s began to provide solid answers to questions that arose during the previous decade. For example, the excavations at the Panther Springs Creek site in Bexar County (Black and McGraw, 1985) began to define the differences between cultures of central Texas proper and the groups that roamed its southern periphery. Other studies that had a significant impact on our understanding of local prehistory include those at site 41BX1 (Lukowski, 1988) and site 41BX300 (Katz, 1987) in San Antonio, and the report of the survey and excavations at Applewhite Reservoir southwest of San Antonio (McGraw and Hindes, 1986).

More recent surveys in Bexar County include a cultural resources survey in 1990 by Geo-Marine (Cliff et al., 1990) of 100 acres along Salado Creek. This survey located eight new archeological sites (41BX442, BX444, BX874–BX879) and relocated one previously recorded site (41BX22).

The Center for Archeological Research (CAR) has conducted numerous investigations that have contributed to a significant increase in the study of Bexar County prehistory. A 1994 CAR survey of 147 acres along Leon Creek in northern San Antonio revisited four previously recorded prehistoric sites located on the floodplain and terraces overlooking the creek (Tennis and Hard, 1995). Site 41BX47, occupying an area of approximately 150,000 square meters and having an occupational history extending from the Late Paleoindian to Late Archaic periods, was recommended as eligible for inclusion in the NRHP (Tennis, 1996). Burned rock features were abundant but yielded few preserved specimens of bone and charcoal.

Geo-Marine, Inc. conducted a survey along Culebra Road in northwest San Antonio, which located one previously unrecorded site (Ahr and Duke, 2002). Site 41BX1465 is a prehistoric lithic quarry

located on a terrace above Culebra Creek that consists primarily of lithic debris. The site was not recommended for further testing.

SWCA conducted a survey near Medio Creek in northwest Bexar County in 2006, which recorded one prehistoric site located on a terrace above Medio Creek (Wilcox, 2006). Site 41BX1691 was recorded as a prehistoric open campsite and yielded lithic debitage and burned rock. The site was not recommended for further testing.

More recently, numerous investigations have been undertaken in Comal County including surveys for Landa Park (Arnn, 1997a, 1997b; Bailey, 1986; Hoyt, 1993; Nickels, 2011), transmission lines (Dockall et al., 2006; Hall et al., 1974; Malof and Prikryl, 2012; Nash, 2003; Taylor, 1995), schools (Hartnett, 2009; Peyton, 2009, 2010; Skoglund, 2002), various transportation projects (Chavez and Miller, 2010; Feit and Stotts, 2007; Miller et al, 2007; State Department of Highways and Public Transportation, 1976; TxDOT, 1991) as well as various watersheds and river basins (Hester et al., 1975; Hester, 1975).

Within the current study area, cultural resources investigations and archeological surveys were largely conducted for road improvement projects including Chavez and Miller (2008), Clark (2011), Ellis et al. (2009), Uecker (2006), and Young (2002a, 2002b). These projects covered portions of FM 1836, Bulverde Road, Borgfield Drive, and US 281, respectively, and generally did not result in the identification of archeological or historic resources. Other investigations in the area include a cultural resources survey for a proposed Comal ISD elementary school (Gibbs and Chavez, 2008) in which no newly recorded archeological sites were identified. In 2004, Atkins conducted a survey on behalf of CPS Energy for the proposed Green Mountain-Stonegate 138-kV transmission line. The survey resulted in the identification of eight newly recorded archeological sites (41BX1582–41BX1589), none of which were recommended as eligible for listing in the NRHP (Smith et al., 2004). The following year, SWCA conducted a survey for a proposed pipeline. The survey resulted in the identification of two newly recorded sites (41CM282 and 41KE159) as well as, identifying portions of a dry-laid stone wall on the Bremer Ranch (constructed ca. 1872), which was reported as being “an excellent example of the type of wall constructed throughout the region by early German settlers” and the Hitzfielder Cemetery (Houk et al., 2005).

Because of the area’s early settlement and as evidenced by the number of historic homesteads and THC-recorded cemeteries, common historic sites include ranching or farming-related sites and associated features such as historic rock walls, pens, corrals, water/soil retention structures, and historic trails, historic cemeteries, and possibly historic trails and schools. Other site types and archeological features commonly investigated in the area include rockshelters, burned rock middens, lithic scatters, campsites, and farmsteads.

3.9.3 Results of the Literature and Records Review

Research of available records and literature was conducted at the Texas Archeological Research Laboratory (TARL), J.J. Pickle Research Campus, The University of Texas at Austin with the purpose of determining the location of previously recorded archeological sites (sites issued a trinomial/recorded at TARL). The THC's on-line Restricted Archeological Sites Atlas files were also used to identify NRHP-listed properties and sites, NRHP districts, cemeteries (including Historic Texas Cemeteries), Official Texas Historical Markers (OTHMs) (including Recorded Texas Historic Landmarks), State Antiquities Landmarks (SALs), as well as any other potential cultural resources such as National Historic Landmarks (NHLs), National Monuments, National Memorials, National Historic Sites, and National Historical Parks to ensure the completeness of the study. As a secondary source of NRHP-listed properties and NHLs, the NPS's NRHP database and GIS Spatial Data as well as the NHL Program were consulted. Because of the study area's proximity to the El Camino Real de los Tejas National Historic Trail (NHT), the NPS El Camino Real de los Tejas Comprehensive Management Plan/Environmental Assessment Maps and Geographic Resources Program National Historic Trails Map Viewer were reviewed. Additionally, TxDOT's database of NRHP-listed and -eligible bridges was also reviewed. COSA's GIS Historic Districts and Historic Landmark Sites data were reviewed.

The results of the literature and records review identified approximately 65 previously recorded archeological sites; 20 cemeteries of which 7 are a Historic Texas Cemeteries (HTCs), and at least 1 is commemorated with an OTHM and is dedicated as a HTC; 1 Recorded Texas Historic Landmark (RTHL); and at least 4 historic farms and ranches that are potentially eligible for listing in the NRHP.

4.0 ENVIRONMENTAL IMPACT OF THE ALTERNATIVE ROUTES

4.1 IMPACT ON NATURAL RESOURCES

4.1.1 Impact on Geological Resources

Construction of the proposed substation and transmission line will have no significant effect on the geological features or resources of the area. Construction of the proposed substation and the erection of structures will require the removal and/or minor disturbance of small amounts of near-surface materials, but will have no measurable impact on geological resources or features at any of the alternative substation sites or along any of the alternative routes. The project will have no significant impact on mineral resources in the study area.

4.1.2 Impact on Soils

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

To provide adequate space for the construction activities associated with transmission lines and to minimize corridor maintenance and operational problems, much of the woody vegetation is generally removed within the ROW. In these areas, the necessary movement of heavy equipment will disturb only the remaining leaf litter and a small amount of herbaceous vegetation. The most important factor in controlling soil erosion associated with construction activities is revegetating areas that have potential erosion problems immediately following construction.

The time and method of substation site and ROW preparation for the transmission line will take into account soil stability, the prevention of silt deposition in water courses, and practical measures for the protection of natural vegetation and the protection of adjacent resources, such as natural habitat for wildlife. Vegetation removal will not be performed until an SWPPP has been prepared and a Notice of Intent (NOI) has been submitted to the TCEQ for the project. Erosion control devices will be constructed where necessary to prevent soil erosion in the ROW, in accordance with the SWPPP. Erosion control devices will be maintained and inspections conducted until the site is sufficiently revegetated, as required by the SWPPP. Natural succession would revegetate the majority of the ROW. If natural revegetation does not provide ground cover in a reasonable length of time, seeding, sprigging or hydroseeding of restored areas may be used to encourage growth of grasses and other vegetation, which is ecologically desirable. Where site factors make it unusually difficult to establish a protective vegetative cover, other restoration procedures may be advisable to prevent erosion, such as the use of gravel, rocks, or concrete.

The topography of the region could potentially create moderate slope stability problems along portions of the transmission line. To reduce potential impact to slopes and to protect slope stability in these areas, CPS Energy could modify construction activities during periods of increased precipitation. Where practical, the grading of temporary roads, construction areas, staging areas, or other areas where vegetation is removed will be minimized. In these areas, slopes will be returned to preconstruction conditions or graded parallel to landscape contours in a manner that conforms to natural topography, except to the extent necessary to establish appropriate ROW, structure sites, and access for the transmission line.

Prime farmland soils, as defined by the NRCS, are soils that have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. The USDA recognizes the importance and vulnerability of prime farmlands throughout the nation and, therefore, encourages the wise use and conservation of these soils where possible. The NRCS provides an exemption from the Farmland Protection Policy Act (FPPA) as the agency does not consider power lines to be conversion of farmland because the site can still be used as farmland after construction. While some prime farmland soils are found in the study area, little agricultural production occurs, and the proposed substation locations would not be expected to substantially impact potential agricultural use in the area. CPS Energy's project is not expected to significantly impact areas of prime farmland soils or other agricultural uses. Regardless, wherever feasible, the alignment of alternative routes follows existing roadways, property lines, fencelines, or other existing ROW to minimize potential impacts, including those to prime farmland.

4.1.3 Impact on Water Resources

4.1.3.1 Surface Water

Construction of the proposed substation and transmission line should have little adverse impact on the surface water resources of the study area. The substation will not be built in the streambed of any drainage feature. Potential impacts on surface waters from any major construction project include siltation resulting from erosion and pollution resulting from the accidental spillage of chemical products (e.g., fuels, lubricants, solvents, petroleum products, etc.). Vegetation removal could result in increased erosion potential of the affected areas, leading to the delivery of slightly higher-than-normal sediment yields to area streams during heavy rainfall events. These short-term effects should be minor, however, because of the relatively small area to be disturbed at any particular time, the short duration of construction activities, the preservation of streamside vegetation where practicable, and CPS Energy's efforts to control runoff from construction areas. In addition, an SWPPP will be prepared for the project, and an NOI will be filed with the TCEQ.

The proposed transmission line will likely span study area streams, and CPS Energy will avoid or minimize the placement of supporting structures in the streambed of drainage features. If appreciable streamflow is present in any of the spanned streams, construction crews will transport machinery and equipment around these areas via existing roads to avoid direct crossings. If a

stream is crossed at the time of construction, some bank and streambed alterations may be necessary to facilitate crossing. Such activities will be conducted in accordance with USACE regulations and the SWPPP. If clearing of vegetation is necessary at stream crossings, CPS Energy may employ selective clearing (i.e., use of chain saws instead of heavy machinery) to minimize erosion problems.

Construction of the proposed substation and transmission line could result in some temporary erosion or short-term disturbance resulting in siltation, but impacts would be minimal and localized because of the intermittent nature of the majority of the crossed streams. No long-term adverse impacts are likely. CPS Energy will make efforts during construction for proper control and handling of any petroleum or other chemical products. The most effective method for avoiding surface water impacts is the implementation of proper spill-prevention and spill-response plans. Should significant soil disturbance occur in close proximity to streams, silt fences or other appropriate erosion control structures will be installed between the areas of disturbance and the waterways to prevent excessive siltation. Care will be taken to prevent brush from spilling into or blocking stream channels.

The number of stream crossings for the 18 alternative routes ranges from 5 (routes B2 and B5) to 11 (routes A8 and A9). None of the alternative routes crosses open water (i.e., ponds, stock tanks, or lakes); however, each of the alternative routes, except routes A3, A6, B3, and B6, are parallel to and within 100 ft of a stream for a short distance. For those routes that are parallel to and within 100 ft of a stream, routes A8, A9, B7, and B8 parallel the shortest distance at approximately 270 ft, and Route A7 parallels the longest distance at approximately 895 ft (see Table 7-2 in Section 7.0).

4.1.3.2 Floodplains

FEMA-designated 100-year floodplains are present within the study area. None of the proposed substation sites is located within FEMA-designated 100-year floodplains. Of the 18 alternative routes, Route C1 crosses the least amount of floodplains (approximately 620 ft), followed by routes B3 and B7 (approximately 1,840 ft). If it becomes necessary to locate transmission line structures within floodplains, the design and construction will be such that it would not impede the flow of any waterway or create hazards during a flood event. Construction activities within the floodplains could result in erosion and sedimentation impacts, especially if flooding were to occur during construction. CPS Energy will have an SWPPP in place prior to beginning construction. The support structures and maintenance access routes within the floodplain will be located so that they would not significantly affect flooding. Some scour could occur around structures if flood-flow depths and velocities become great enough. Careful site placement of structures should eliminate the possibility of significant scour. None of the alternative routes should have significant impacts on the function of floodplains, nor adversely affect adjacent, upstream, or downstream properties.

4.1.3.3 Groundwater

The construction, operation, and maintenance of the proposed substation and transmission line should not adversely affect groundwater resources in the study area or vicinity. The effect of the proposed substation and transmission line on groundwater resources would be negligible because the substation and line will be aboveground rather than buried. The amount of recharge area disturbed by construction is insignificant compared to the total amount of recharge area available for the aquifer systems in the region. No measurable alteration of aquifer recharge capacity should occur, and the likelihood of groundwater contamination is not significant.

The main potential groundwater impact from construction activities associated with the proposed project is possible contamination from the accidental spillage of chemicals (e.g., fuels, lubricants, solvents, petroleum products, etc.). The most effective method to avoid groundwater impacts is the implementation of proper spill-response plans. It is unlikely that polluted surface water runoff will contaminate any groundwater supplies; however, such control measures will be in place as additional precautionary measures during the construction phase of the project. In addition, the proposed project will require an SWPPP and the filing of an NOI with the TCEQ.

All three of the alternative substation sites lie within the Edwards Aquifer Contributing Zone. This zone, 5,400 square miles in size, is a catchment area that collects rainwater into streams, which then flow into the recharge zone. Regardless of which site is ultimately selected, CPS Energy will have to submit a Water Pollution Abatement Plan (WPAP); a Contributing Zone Plan will be required only if the substation site requires more than 5 acres (including access roads).

4.1.4 Impact on Ecosystems

4.1.4.1 Vegetation

The primary impact to vegetation from the proposed project will be the removal of existing woody vegetation from site preparation and construction of the proposed substation and along the proposed transmission line ROW. The amount of vegetation cleared is dependent upon the type of vegetation present. For example, the greatest amount of vegetation clearing along the transmission line would occur in wooded areas, whereas pasture and rangeland 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.

CPS Energy will minimize the amount of flora and fauna disturbed during construction of the substation and transmission line when possible, except to the extent necessary to establish appropriate ROW clearance for the transmission line. In addition, after construction of the transmission line, CPS Energy will determine whether any reseeding of the ROW would be useful

and practical to facilitate erosion control; CPS Energy will consider landowner preferences in doing so. Soil conservation practices will benefit native vegetation and assist in the successful restoration of disturbed areas. While natural succession would revegetate the majority of the ROW, if natural revegetation does not provide ground cover in a reasonable length of time, seeding, sprigging or hydroseeding of restored areas may be used to encourage growth of grasses and other vegetation, which is ecologically desirable.

Vegetation community types were identified from interpretation of aerial photography and verified in the field where possible. The percent of woodland at each of the three alternative substation sites was estimated, while the approximate extent of the vegetation communities occurring along the alternative routes was determined by measuring the linear distance from 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 reconnaissance of the study area. The results of these measurements are presented in tables 7-1 and 7-2 (Section 7.0) and are discussed below.

Of the three of the alternative sites, Site C has the least amount of upland woodland/brushland coverage (approximately 20%) and would require the least amount of clearing. Site B would have the second-least coverage (approximately 50%) of upland woodland/brushland vegetation. Site A contains approximately 75% upland woodland/brushland vegetation, and impacts would be greater for this location. None of the alternative substation sites would require the removal of any bottomland/riparian woodland (see Table 7-1).

All 18 primary alternative routes would require the removal of upland forest and bottomland forest. Of the 18 alternative routes, Route B6 would have the least impact on woody vegetation (approximately 7,755 ft of upland woodland/brushland and 985 ft of bottomland/riparian woodland), followed by Route B3 (approximately 7,870 ft of upland woodland/brushland and 985 ft of bottomland/riparian woodland). Route C1 would have the most impact on woody vegetation, crossing approximately 12,605 ft of upland woodland/brushland and 1,250 ft of bottomland/riparian woodland (see Table 7-2).

4.1.4.2 Waters of the U.S., Including Wetlands

Wetlands potentially affected by the proposed substation and transmission line would generally be minor in extent because of the nature of surface water features in the region. The greatest potential for the occurrence of wetland habitat along the routes would be within floodplains and along the margins of streams or ponds. Many of the potential wetlands within the study area are upland stock tanks and ponds, which the USACE generally defines as “isolated waters,” and therefore are not regulated. Ponds that are impoundments on streams are likely waters of the U.S. because of their connection to the surface tributary system, and, therefore would be considered within USACE jurisdiction.

Upon selection of a substation and a final route, an assessment of the substation and transmission line would be necessary to determine whether any jurisdictional waters (i.e., waters of the U.S., including wetlands) occur within the site or within the transmission line ROW. If any jurisdictional waters do occur within the proposed ROW, it is likely that the aerial transmission line will easily span those features. While CPS Energy attempts to avoid placement of structures in waters of the U.S., including wetlands, placement of structures in these areas will comply with USACE regulations.

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 will comply with USACE regulations. The number of stream crossings for the 18 alternative routes ranges from 5 (routes B2 and B5) to 11 (routes A8 and A9).

4.1.4.3 Wildlife

Impacts on wildlife from the proposed substation and transmission line include short-term effects resulting from physical disturbance during construction, as well as long-term effects resulting from habitat modification. The net effect on local wildlife from these two impact types, however, is typically minor. The following section provides a general discussion of the effects of substation and transmission line construction and operation on terrestrial wildlife, followed by a discussion of the possible impact of the alternative substation sites and routes for the project.

Any required clearing or other construction-related activities would directly and/or indirectly affect most animals that reside within or traverse the proposed substation site and transmission line ROW. Heavy machinery may adversely affect smaller, low-mobility species, particularly amphibians, reptiles, and small mammals.

If construction occurs during the breeding season (generally spring to fall), construction activities may adversely affect the young of some species. Heavy machinery may cause soil compaction, which may adversely affect fossorial animals (i.e., those that live underground). Mobile species, such as birds and larger mammals, may avoid initial clearing and construction activities and move into adjacent areas outside the construction areas and ROW. Construction activities may temporarily deprive some animals of cover and, therefore, potentially subject them to increased natural predation. Wildlife in the immediate area may experience a slight loss of browse or forage material during construction; however, the prevalence of similar habitats in adjacent areas and vegetational succession in the ROW following construction would minimize the effects of these losses.

The increased noise and activity levels during construction could potentially disturb the daily activities (e.g., breeding, foraging, etc.) of species inhabiting the areas adjacent to the substation and transmission line ROW. However, given the commercial and residential nature of the area, wildlife

is somewhat accustomed to noise and human activity. Dust and gaseous emissions should minimally affect wildlife. Although construction activities may disrupt the normal behavior of many wildlife species, little permanent damage to these populations should result. Periodic clearing along the ROW, while producing temporary negative impacts to wildlife, can improve the habitat for ecotonal or edge species through the increased production of small shrubs, perennial forbs, and grasses.

Transmission line structures could benefit some bird species, particularly raptors, by providing resting and hunting perches, particularly in open, treeless habitats (Olendorff et al., 1981; Avian Power Line Interaction Committee [APLIC], 1994, 1996). Raptor species, particularly the red-tailed hawk, and corvids (ravens and crows) often use the support structures as nesting sites. Vultures and corvids commonly use the structures as roosting sites, and the wires and structures often serve as hunting or resting perches for species such as the red-tailed hawk, American kestrel, mourning dove, loggerhead shrike, and meadowlarks (*Sturnella* spp.). As a result, transmission lines have significantly increased raptor populations in several areas of the U.S. (APLIC, 1994). Additionally, edge-adapted species (e.g., blue jay, some flycatchers, northern cardinal, northern bobwhite [*Colinus virginianus*], Cooper's hawk [*Accipiter cooperii*], brown-headed cowbird [*Molothrus ater*], and northern mockingbird) may flourish along changed vegetation areas adjacent to the transmission ROW (Rochelle et al., 1999). The danger of electrocution to birds from this project will be insignificant because the distance between conductors or conductor and structure or ground wire on 138-kV transmission lines is greater than the wingspan of any bird in the area.

Several studies have indicated that forest fragmentation has a detrimental effect on some avian species that show a marked preference for large undisturbed forest tracts (Robbins et al., 1989; Terborgh, 1989). In general, the distribution of individual species is not random with regard to habitat size. In addition, area-sensitive species requiring forest interior habitat are typically more sensitive to fragmentation than edge-adapted species and are particularly vulnerable to predation, brood parasitism, and other impacts on nesting success. Passerines nesting within the study area could become vulnerable to nest predation or parasitism by edge-adapted species such as ravens, jays, and cowbirds (Robbins et al., 1989; Terborgh, 1989; Faaborg et al., 1992; Hagan et al., 1996; Rochelle et al., 1999; Herkert et al., 2003).

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, 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 (Gauthreaux, 1978; Willard, 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).

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

Waterfowl (ducks, geese, swans, cranes, shorebirds, etc.) are among the birds most susceptible to wire strikes (Faanes, 1987; Erickson et al., 2005), and yet, despite these hazards, it has been estimated that wire strikes (including distribution lines) account for less than 0.1% of waterfowl nonhunting mortality, compared with 88% from diseases and poisoning and 7.4% because of weather (Stout and Cornwell, 1976). In some areas, hunting affects 20% to 30% of waterfowl populations (Thompson, 1978). Suitable habitat for waterfowl within the study area is limited to Cibolo Creek, small isolated ponds, and streams and the normal flying altitudes of any waterfowl migrating through the area are considerably greater than the heights of the proposed transmission towers; therefore, significant impacts are unlikely.

Utility companies can employ several means to minimize transmission line impacts on birds in flight. The initial placement of a transmission line is the most important consideration (Avery, 1978; APLIC, 1994, 2006). The proximity of a transmission line to areas of frequent bird use (such as communal foraging or roosting areas, rookeries, wetlands, etc.) is crucial. This is especially true for daily use areas, such as feeding areas or other areas where birds may be taking off or landing regularly (APLIC, 1994, 2006). The position of the individual structures can also help reduce collisions. Faanes (1987), in an in-depth 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. In areas where the transmission line passes between roosting and foraging areas, the structures can be placed in the center of the flyway (i.e., where the birds are more likely to fly) to increase their visibility, in addition to marking the wires.

Other considerations during the initial transmission line routing include the height of the surrounding vegetation and the topography of the area (APLIC, 1994). The height of transmission lines relative to the surrounding vegetation can help reduce the probability of collisions. Lines built at the height of the surrounding trees seldom are a problem for forest-dwelling birds, and large

birds will avoid the tree line, thus avoiding the transmission line (Thompson, 1978; APLIC, 1994, 2006). Consideration of topographical features such as valleys, ridges, and mountain passes, can also help avoid important flight paths.

Faanes (1987) reported that 97% of birds observed colliding with a power line did so with the ground (static) wire, largely because of attempts to avoid the conductors. Beaulaurier (1981) found that removal of the ground wire at two study sites in Oregon resulted in a reduction in collisions of 35% and 69%. However, since overhead static wires are installed on transmission lines for safety and reliability reasons, CPS Energy believes that increasing the visibility of the static wire is a better alternative, when necessary. Increasing the visibility of the wires by using markers such as orange aviation balls, black-and-white ribbons, or spiral vibration dampers, particularly at mid span, 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% when compared to 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 length of ROW parallel to streams, impacts to wetlands, the length of the line paralleling existing, cleared ROW, and the total length of the line (see Table 7-2).

Impacts to aquatic ecosystems from transmission line construction are generally minor. Aquatic features within the study area, such as streams, springs, and ponds, are easily spanned, and the implementation of sedimentation controls (an SWPPP will be in place) during construction will help to minimize erosion and sedimentation into area streams. The main considerations regarding potential impacts to aquatic systems include the number of rivers and streams crossed, amount of open water habitat crossed, length of ROW in 100-year floodplains, and ROW parallel to, and within 100 ft of, rivers and streams. Other considerations relevant to aquatic systems are associated with the amount of ROW that will require clearing, particularly across wetlands, riparian woodlands, and upland woodlands. These have been discussed above.

Substation Site C is the most favorable site from a wildlife perspective because it would require the least amount of woodland habitat clearing (20% of substation site), followed by Substation Site B

(50% of substation site). Substation Site A would require the most woodland clearing (75% of substation site), making it the least favorable from a wildlife perspective.

Route B5 is the most favorable route from a wildlife perspective because it crosses the third-least amount of combined woodland habitat (approximately 9,005 ft) and is the third-shortest alternative route. Generally, the shorter the line, the less potential for bird mortality through collision with the structures or wires. Furthermore, Route B5 crosses the fewest streams and least amount of wetlands, and crosses the second-least amount of the Edwards Aquifer Recharge Zone (EARZ) (approximately 9,425 ft). Route B2 is ranked second from a wildlife standpoint, followed by Route B6. Route B2 crosses the forth-least amount of woodland habitat (approximately 9,120 ft), is the shortest alternative route, and crosses the fifth-least amount of EARZ (approximately 10,020 ft). Route B6 crosses the least amount of woodland habitat (approximately 8,740 ft), is the fourth-shortest alternative route, and crosses the third-least amount of EARZ (approximately 9,760 ft). As with Route B5, routes B2 and B6 cross the least amount of wetlands. Route C1 is the least favorable from a wildlife standpoint. It crosses the greatest amount of woodland habitat (approximately 13,855 ft), and crosses the greatest amount of wetlands (approximately 245 ft).

4.1.4.4 Endangered and Threatened Species

As noted earlier in this report, FWS and TPWD were consulted to determine the potential occurrence of federally or state-listed endangered or threatened plant and animal species. No federal-/state-listed plant species have been recorded from either Bexar County or Comal County (Poole et al., 2000; FWS, 2013a; TPWD, 2013a); however, the bracted twistflower is a candidate for federal listing. This species is known to occur in Bexar County and project-related impacts to this species are possible, although unlikely. Additionally, FWS includes the federally listed endangered Texas wild-rice on its Bexar and Comal County lists. This species is endemic to Hays County, but FWS includes it on its Bexar and Comal County lists only because activities within the southern segment of the Edwards Aquifer, which includes Bexar and Comal counties, may affect it. Since the Edwards Aquifer in the study area is located several hundred feet below the surface, the project is not expected to impact Texas wild-rice or any of the other Edward's Aquifer species, such as the fountain darter, Texas blind salamander, San Marcos salamander, Comal Springs riffle beetle, Comal Springs dryopid beetle, and Peck's cave amphipod.

The golden-cheeked warbler, federally and state-listed as endangered, has been recorded from Bexar and Comal counties, and records exist from 2001–2005 within the southwestern portion of the study area (TPWD, 2013b). Although much of this area has been cleared for development in recent years, enough suitable habitat is still present to sustain territories, and it is likely still to occur in the study area. Additional areas of potential golden-cheeked warbler habitat are located within 300 ft of potential substation Site C, and in or within 300 ft of Route C1. If golden-cheeked warblers occur in or within 300 ft of the proposed substation site or transmission line ROW, they may be impacted by the proposed project.

The federally and state-listed endangered black-capped vireo has been recorded from Bexar and Comal counties but not from the study area (FWS, 2013a; TPWD, 2013a, 2013b). It is unlikely to occur in the study area due to lack of suitable habitat and is not expected to be impacted by the proposed project.

Eight of the primary alternative routes cross some Karst Zone 1 (areas known to contain endangered karst vertebrates), and all 18 primary alternative routes cross some Karst Zone 2 (areas having a high probability of containing endangered karst invertebrate species). None of the three potential substation sites occurs in either Zone 1 or Zone 2. Prior to construction, CPS Energy may conduct a survey of the final selected substation site and transmission line route to locate any previously unknown karst features. If any such features are found, CPS Energy will consult with FWS and may utilize techniques such as ground-penetrating radar to avoid subsurface karst features at structure locations. Because karst features can be spanned, no impacts to any endangered karst invertebrates from the proposed transmission line are anticipated.

No long-term impacts from construction and operation of the proposed substation and 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. The whooping crane, interior least tern, Sprague's pipit, wood stork, white-faced ibis, bald eagle, zone-tailed hawk, and peregrine falcon, if they occur in the study area, are likely to do so only as transitory migrants or post-breeding wanderers. While the transmission line structures may pose a hazard for these birds, the normal flying altitudes during migration are greater than the height of the proposed structures. The wires themselves may provide roosting sites for birds passing through the area.

The Texas horned lizard, timber rattlesnake, Texas indigo snake, Texas tortoise, and Cagle's map turtle, if they occur at the proposed site or in the transmission line 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) and jaguarundi are not expected to occur in the study area and are highly unlikely to be impacted by the project.

The aquatic widemouth blindcat, toothless blindcat, Cascade Caverns salamander, and Comal blind salamander are not expected to occur in the study area and will not be impacted by the proposed project. Four state-listed freshwater mussels are of potential occurrence in Bexar and/or Comal County (TPWD, 2013a); however, no records exist for the study area (TPWD, 2013b), and these species are not likely to occur there. Thus, they are unlikely to be impacted by the proposed project. 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, while critical habitat has been designated for seven of the endangered karst invertebrate species in Bexar County, none of this habitat occurs in the study area. Therefore, no impact to critical habitat as a result of the proposed project will occur.

4.1.5 Summary of Impact on Natural Resources

Substation Site B is the most favorable site from an ecological perspective because it would require the second-least amount of woodland habitat clearing (50% of substation site) and is not located within 300 ft of any potential federally endangered golden-cheeked warbler habitat. Substation Site A is ranked second from an ecological standpoint, followed by Substation Site C. While Substation Site A would require the greatest amount of woodland habitat clearing (75% of substation site), it is not located within 300 ft of any potential golden-cheeked warbler habitat, and although Substation Site C would require the least amount of woodland clearing (20% of substation site), it is located within 300 ft of potential golden-cheeked warbler habitat, thus making it the least favorable site from an ecological standpoint.

Route B5 is the most favorable route from an ecological perspective because it does not cross any potential federally endangered golden-cheeked warbler habitat, or have potential habitat within 300 ft of the ROW, crosses the third-least amount of woodland habitat, and is the third-shortest alternative route. Furthermore, Route B5 crosses the fewest streams and least amount of wetlands, and crosses the second-least amount of the EARZ. Route B2 is ranked second from an ecological standpoint, followed by Route B6. As with Route B5, routes B2 and B6 do not cross any potential golden-cheeked warbler habitat, or have potential habitat within 300 ft of the ROW, and cross the least amount of wetlands. Route B2 crosses the fourth-least amount of woodland habitat, is the shortest alternative route, and crosses the fifth-least amount of EARZ. Route B6 crosses the least amount of woodland habitat, is the fourth-shortest alternative route, and crosses the third-least amount of EARZ. Route C1 is the least favorable from an ecological standpoint. It crosses the most potential golden-cheeked warbler habitat, and is within 300 ft of the most potential habitat; it crosses the greatest amount of woodland habitat, and crosses the greatest amount of wetlands.

4.2 IMPACT ON HUMAN RESOURCES

4.2.1 Socioeconomic Impact

Because CPS Energy normally uses its own employees or subcontractors during the clearing and construction phase of substations and transmission line projects, minimal short-term local employment will be generated. A portion of the project wages, however, 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 of acquisition) will be made to individuals whose lands are crossed by the transmission line based on the appraised land value, resulting in increased income to those landowners. Because CPS Energy would require easements only for the proposed

line, none of this land will be taken off the tax rolls. The cost of permitting, designing, and constructing the line will be paid for through revenue generated by the sale of electrical service.

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

4.2.2 Impact on Community Values

Potential adverse effects on 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 related to the location and specific characteristics of a proposed substation and transmission line, and do not include possible objections to the substation and 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 substation and 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 substation, 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 substation and transmission line construction are determined by the amount of land, of whatever use, displaced by the actual structure and ROW (direct impacts) and by the compatibility of substation and electric transmission line ROW with adjacent land uses (indirect impacts). During construction, temporary impacts to land use at the chosen site and within the ROW could occur due to the movement of construction workers, vehicles, and materials through the area and along the ROW. Construction noise and dust, as well as some temporary disruption of traffic flow, may also temporarily affect residents and businesses in the area immediately adjacent to the chosen site and the ROW. Coordination among CPS Energy, contractors, and landowners regarding access to the site and 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 paralleling existing ROW and 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 within a specified distance of a substation site or an alternative route centerline. Habitable structures are defined by the PUC as ". . . single-family and multifamily dwellings and related structures, mobile homes, apartment buildings, commercial structures, industrial structures, business structures, churches, hospitals, schools, or other structures normally inhabited by humans or intended to be inhabited by humans on a daily or regular basis." Atkins staff determined the number of habitable structures within the actual footprint and within 300 ft of the alternative substation sites and the alternative routes by reviewing aerial photography, supported by field reconnaissance where possible.

None of the three alternative substation sites have habitable structures within the footprint of their respective proposed locations. When comparing sites based on habitable structures within 300 ft, sites A and C have the fewest, with zero habitable structures, while Site B has four (four commercial structures) (Table 7-1 in Section 7.0).

Eight of the 18 primary alternative routes being evaluated (routes A1, A2, A4, A5, B1, B2, B4, and B5) have one habitable structure, a warehouse, located within 50 ft of their centerlines. No other alternatives have a habitable structure within the 50 ft of their centerlines. Overall, Route A7 has the fewest habitable structures located within 300 ft of its centerline, with 20 structures, followed by routes A6 and C1 (21 structures) and Route A9 (22 structures). Route A2 has the greatest number of habitable structures (46) located within 300 ft of its centerline, 17 of which are commercial buildings. Route A1 has 42 habitable structures within 300 ft of its centerline (14 commercial buildings), followed by routes B2 and B5 (40 habitable structures) and A5 (38 structures).

Paralleling existing compatible ROW is also generally considered a positive routing criterion, one that usually results in fewer impacts than establishing new ROW and is, in fact, included in the PUC's transmission line certification criteria. Each primary alternative route parallels existing compatible ROW located along the numerous roadways within the study area. When comparing the routes for this project, Route C1 parallels the greatest amount of compatible ROW (21,265 ft or approximately 93% of its total length), followed by Route B1 (75%), Route A1 (66%), and routes B2 and B4 (approximately 64% each). Route B6 parallels the least amount of existing compatible ROW with approximately 44% its total length.

Another important land use criterion is the length of property lines paralleled. In the absence of existing ROW to follow, paralleling property or fence lines minimizes the potential for disruption to agricultural activities and creates less of a constraint to future development of a tract of land. Property lines that occur along existing ROW (e.g., highways and pipelines) were not included in this category, as the intent was to parallel the ROW and not the property line. In this regard, Route B6 parallels the greatest length of property lines (approximately 61% of its total length), followed by routes B5 and B4 (54% and 52%, respectively). By comparison, Route C1 does not parallel any property lines, and Route A7 only parallels property lines for approximately 0.07% of its length.

Finally, the overall length of a particular alternative route can be an indicator of the relative level of land use impact, either existing or planned. Shorter routes generally affect fewer landowners and would usually result in fewer potential impacts. In this regard, Route B2 is the shortest route at approximately 20,330 ft (3.85 miles), followed closely by Route B3 (20,665 ft, or 3.91 miles), and Route B5 (20,700 ft, or 3.92 miles). By comparison, Route A9 is the longest alternative at approximately 29,495 ft (5.59 miles), followed by Route A4 (28,310 ft, or 5.36 miles), and Route A8 (27,755 ft, or 5.26 miles).

The proposed substation and transmission line would have a limited effect on communication operations in the area. No AM radio transmitters within 10,000 ft of any of the alternative substation sites (FCC, 2013). However, Site A has one electronic communication tower, and Site C has two electronic communication towers within 2,000 ft of the proposed site location.

Additionally, no AM radio transmitters occur within 10,000 ft of any of the transmission line ROW centerlines. Every alternative route, however, would be located within 2,000 ft of an electronic communication tower. Of these, Route A7 would have one electronic communication tower within 2,000 ft, and routes A1, A2, A4, and A5 would have the greatest amount of communications towers (five) within 2,000 ft.

4.2.4 Impact on Recreation

Potential impacts to recreational land use include the disruption or preemption of recreational activities. None of the alternative substation sites are located within the boundaries of a designated park or recreation area. Additionally, none of the sites is located within 1,000 ft of any designated park or recreational area. Ten of the proposed alternative routes (routes A3, A6, A7, A8, A9, B3, B6, B7, B8, B9, and C1) cross a small portion (60 ft) of the Indian Springs Conservation Association; however, since these routes are not located across any significant portion of the park, no interference with any potential recreational activities would result and any potential impacts to this facility would be indirect and more likely to be visual in nature. Additionally, Routes A1, A2, A4, A5, B1, B2, B4, and B5 would each be within 1,000 ft of the Indian Springs Conservation Association.

4.2.5 Impact on Agriculture

Impacts to agricultural lands can generally be ranked by degree of potential impact, with the least potential impact occurring in areas where grazing is the primary use (pasture or rangeland), followed by cultivated cropland, with forested/wooded land (orchards, commercial timber, etc.) having the highest degree of potential impact.

The study area occurs in a portion of San Antonio that is experiencing intense commercial and residential development, and agriculture constitutes only a small portion of land use throughout the study area. 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, irrigation/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. Very little cropland is located within the study area. None of the alternative substation sites is located in cropland and the amount of cropland crossed by any of the alternative routes is minimal. Fourteen of the routes do not cross any cropland, and the remaining three routes (A4, A5, and A6) cross approximately 345 ft.

4.2.6 Impact on Transportation/Aviation

Potential impacts to transportation could include minor impacts to road surfaces, disruption of traffic or conflicts with proposed roadway and utility improvements, and may also include increased traffic during the construction period. The project would generate only minor construction traffic at any given time or location, however. This traffic would consist of construction employees' personal vehicles, truck traffic for material deliveries, concrete trucks for structure foundation work, and mobile cranes for structure erection. These impacts are usually temporary and short term. CPS Energy will obtain road-crossing and access permits from TxDOT for any state-maintained roads or highways, which include U.S. and state highways and FM/RM roads, crossed by the approved route. Sixteen of the 18 primary alternative routes for the Bulverde substation and transmission project cross US 281 twice, while routes A7 and C1 do not cross any U.S. or state highways. Additionally, alternative routes A1 through A9 would cross FM 1863.

According to Federal Aviation Regulations (FAR), Part 77 (FAA, 1975), FAA notification of the construction of a proposed substation and 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 an FAA-registered 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 outward and upward at a slope of 50 to 1 for a horizontal distance of 10,000 ft. For heliports, notification is 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.

Structure heights will generally range from 80 to 120 ft, depending upon location and design. One FAA-registered airport, the Bulverde Airpark, is located in the northwest portion of the study area near the intersection of US 281 and FM 1863. The airport facilities include one asphalt runway

measuring 2,890 x 40 ft. Each of the alternative primary routes, except Route C1, is within 10,000 ft of the airfield. According to Atkins preliminary calculations, any alternative using segments 1, 6, 7, 8, or 10 (each alternative except for A7 or C1) will require FAA notification. The proposed substation and transmission line project, however, should have little or no effect on aviation operations in the study area.

4.2.7 Impact on Aesthetics

Aesthetic impacts, or impacts on visual resources, exist when the ROW, lines, and/or structures of a substation and transmission line system create an intrusion into, or substantially alter the character of, an 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, Atkins conducted investigations to determine whether the substation site would be visible from selected publicly accessible areas and 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, churches, schools, and cemeteries, particular scenic vistas that were encountered during the field surveys, and U.S. and state highways within the study area. Measurements were made to estimate the length of each of the primary alternative routes that would fall within a recreational or major highway foreground visual zone (FVZ), which is equal to 0.5 mile unobstructed by vegetation or topography. The determination of the visibility of the transmission line from various points was calculated from USGS topographic maps and aerial photography, in conjunction with field visits.

Construction of the proposed substation and 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 substation, structures and clearing of the ROW. Where wooded areas are cleared, piles of brush and wood debris could have a temporary negative impact on the local visual environment. Permanent impacts from the project would involve the views of the substation, structures and lines, as well as views of cleared ROW. Aesthetic impacts from the construction of this project are considered to be moderate. The alternative routes are located in an area that has experienced a high degree of alteration due to the existing transportation facilities and residential and commercial development. Since Atkins does not have access to private property within the study area, the aesthetic analysis is generally based on the potential visual impacts to publicly accessible areas (highways and other well-traveled roads, community facilities, etc.). CPS Energy will attempt to mitigate, as much as possible, the potential visual impacts of the proposed project, regardless of which route is ultimately selected.

As noted above, a transmission line (structures and wires) is considered to be within the FVZ if it is visible (i.e., not obstructed by terrain or trees) within 0.5 mile of an observer. Sixteen of the 18 primary alternative routes for the Bulverde substation and transmission project would have

significant portions of their ROW located within the FVZ of US 281, because they parallel and cross US 281. Routes C1 and A7 have the least amount of ROW located within the FVZ of U.S. and state highways, with approximately 0 ft and 2,535 ft, respectively, within the FVZ (0.5 mile) of US 281. Route A8 has the greatest length within the FVZ of US 281 (approximately 25,835 ft, or 4.9 miles), closely followed by Route A1 (approximately 25,800 ft, or 4.9 miles), then Route A2 (approximately 24,730 ft, or 4.7 miles), Route A3 (approximately 23,920 ft, or 4.5 miles), and Route A9 (approximately 23,910 ft, or 4.5 miles). When comparing routes based on amount of ROW located within the FVZ of FM/RM roads, nine of the proposed alternative routes (routes B1, B2, B3, B4, B5, B6, B7, B8, and C1) do not have any portion of the ROW within the FVZ of FM 1863. Each of the A routes must cross FM 1863, and therefore contain a portion within the FVZ of FM/RM roads. Routes A4, A5, A6, A7, and A9 have the least amount of ROW located within the FVZ of FM 1863, with approximately 2,825 ft (0.5 mile), while routes A1, A2, A3, and A8, have the greatest amount visible with approximately 4,325 ft (0.8 mile).

All of the proposed alternative routes have some portion located within the FVZ of parks and recreational areas. Six of the proposed alternative routes (routes A3, A6, A7, B3, B6, and C1) cross a small portion (60 ft) of the Indian Springs Conservation Association. Routes A7 and C1 have the least amount of ROW located within the FVZ of parks and recreational areas, with approximately 3,330 ft (0.6 mile). Routes B6 and B8 have the greatest amount of ROW located within the FVZ of parks and recreational areas, with approximately 9,795 ft (1.9 miles). Additionally, with the exception of Route C1, each of the proposed alternative routes would have some ROW located within the FVZ of churches, schools, hospitals, and cemeteries. Routes B1, B2, B3, and B7 would have the least amount of ROW located within the FVZ for this category (approximately 9,745 ft, or 1.8 miles), while routes A4, A5, A6, and A9 would have the greatest amount of ROW located within the FVZ of churches, schools, hospitals, and cemeteries (approximately 15,835 ft, or 3.0 miles).

4.2.8 Summary of Impact on Human Resources

From a land use perspective, Site C was ranked first, followed by sites A and B, respectively. Site C would have the least impact on aesthetics. Along with Site A, Site C has no habitable structures either within the footprint or within 300 ft of the footprint. Site B on the other hand is within 300 ft of four habitable structures (all commercial) and was ranked last.

The evaluation of potential land use impacts focused on existing land use and development patterns within the study area. Routes that parallel compatible ROW, particularly major roadway corridors, were preferred to the alternatives that extend across open, undeveloped land. Although the alternatives that parallel US 281 have greater numbers of habitable structures located within 300 ft of their centerlines (a good portion of which are commercial structures), they would cause less land use disturbance as compared to routes that do not parallel corridors. Route C1 is the preferred route from a land use perspective, as it parallels the greatest length of compatible ROW (approximately 4.3 miles, or 93% of its total length), is only 0.5 mile longer than the shortest alternative, and has the second-fewest number of habitable structures located within 300 ft (21).

Routes B2 and B4 were ranked second and third by the land use evaluator, respectively. Route B1 is only 1,056 ft longer than the shortest alternative and parallels compatible ROW for approximately 75% of its total length, while Route B4 is only 1,435 ft longer than the shortest route and parallels compatible ROW for approximately 64% of its total length. Both Route B1 and Route B4 have 36 habitable structures located within 300 ft (13 of which are commercial).

Conversely, Route A7 is the least favorable alternative from a land use perspective. Although it actually has the fewest number of habitable structures located within 300 ft, it traverses the greatest amount of undeveloped land and parallels major roadways to a much lesser degree. It would therefore create a greater intrusion into the landscape and impact land use to a greater degree by introducing an additional major infrastructure corridor through undeveloped land that is surrounded by residential subdivisions.

4.3 IMPACT ON CULTURAL RESOURCES

Any construction activity has the potential for adversely impacting cultural resource sites. Although this substation and transmission line project is currently being conducted without the need for federal funding, permitting or assistance, federal guidelines established under Section 106 of the National Historic Preservation Act of 1966, as amended, provide useful standards for considering the severity of possible direct and indirect impacts. According to the Secretary of the Interior's Guidelines for protection of cultural resources (36 CFR 800), adverse impacts may occur directly or indirectly when a project causes changes in archeological, architectural, or cultural qualities that contribute to a resource's historical or archeological significance.

4.3.1 Direct Impacts

Direct impacts to cultural resource sites may occur during the construction phase of the proposed substation and transmission line and cause physical destruction or alteration of all or part of a resource. Typically, direct impacts are caused by the actual construction of the substation/ transmission 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. Additionally, construction of a substation/transmission line may directly alter, damage, or destroy historic buildings, engineering structures, landscapes, or districts. Direct impacts may also include isolation of a historic resource from or alteration of its surrounding environment (setting).

4.3.2 Indirect Impacts

Indirect impacts include those effects caused by the project that are further removed in distance, or that occur later in time but are reasonably foreseeable. These indirect impacts may include introduction of visual or audible elements that are out of character with the resource or its setting. Indirect impacts may also occur as a result of alterations in the pattern of land use, changes in population density, accelerated growth rates, or increased pedestrian or vehicular traffic. Historic

buildings, structures, landscapes, and districts are among the types of resources that might be adversely impacted by the indirect impact of the proposed substation and transmission line.

4.3.3 Mitigation

The preferred form of mitigation for impacts to 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. Indirect impacts on historical properties and landscapes can be lessened through careful design and landscaping considerations. Relocation may also be possible for some historic structures. Additionally, in the event that CPS Energy or its contractors encounter any cultural resources, including human remains, during construction, work should cease immediately in the vicinity of the resource, the discovery reported to the THC, and action taken as directed by the THC.

4.3.1 Summary of Cultural Resource Impacts

Because the study area contains areas with a high probability of containing cultural resources sites, the construction of the proposed substation and transmission line does have the potential to impact previously unrecorded cultural resource sites. One method utilized by archeologists to assess an area for the potential occurrence of cultural resources is to identify high probability areas (HPAs). HPA is an area that is considered to have a potential for containing previously unrecorded archeological sites. The identification of HPA is usually accomplished by examining 7.5-minute topographic maps and, sometimes, aerial photography. When identifying HPAs, topography and the availability of raw material, water, and subsistence resources are all taken into consideration. Also examined are the geological processes in the immediate action area. These may be considered important because geologic events may protect the integrity of an archeological site by burying it within deep sediments, or alternately, destroying it through erosional processes. Locations that are usually identified as HPAs for the occurrence of prehistoric sites include water crossings, stream confluences, drainages, alluvial terraces, wide floodplains, upland knolls, and areas where lithic or other subsistence resources could be found. Historic sites would be expected adjacent to historic roadways and in areas with structural remains.

The designation of HPA and the evaluation of the substation site and alignment of the transmission line for their potential to contain previously unrecorded cultural resource sites were made on the basis of topographic maps. As of this report, no Atkins archeologist or historian has conducted cultural resource investigations within the study area for this project. Therefore, some of the designated HPAs (as well as direct and indirect impacts) may change when a visual reconnaissance or survey is conducted. In addition, the plotting accuracy for the previously recorded archeological sites is not necessarily precise. Most of these sites were plotted by field archeologists based on topographic features and manual measurements which were then submitted to TARL for inclusion in their maps.

The results of the records and literature review indicated that in the portion of the study area where archeological investigations have been conducted, cultural resource sites have been recorded. At the time the records and literature review was conducted, five previously recorded archeological sites (41BX746, 41BX1695, 41BX1696, 41BX1891, and 41CM294), one RTHL (Wilhelm Weidner Homestead), and four HTCs (Heinrich Voges, Fritz Voges, Wilhelm Weidner, and Koch cemeteries) were identified as being crossed or within 1,000 ft of a potential substation site or an alternative route. Other unrecorded cultural resource sites in proximity to the alternative substation sites/routes, or sites recorded after the file review was completed, are not accounted for in this total. Table 4-1 provides information on cultural resource sites in the vicinity of these alternative substation sites and routes.

TABLE 4-1

CULTURAL RESOURCE SITES IN THE VICINITY OF THE PROJECT AREA

Archeological Site	Previous Investigation Type	Conducted by…	Site Type	Explanation of Type/Consists of…	Eligibility
41BX746	Survey	M. Kohnitz	Occupation	Burned rock midden	Unknown/Undetermined
41BX1695	Impact Evaluation	Atkins	Lithic scatter	Tested cobbles, modified flakes and debitage with a preform and a Plainview-like dart point basal fragment	Ineligible
14BX1696	Impact Evaluation	Atkins	Lithic scatter	Tested cobbles, modified flakes and debitage with a preform and a Pedernales-like dart point base fragment	Ineligible
41BX1891	Impact Evaluation	GTI Environmental Inc.	Prehistoric surface scatter	Debitage	Ineligible
41CM294	Survey	South Texas Archeological Association	Rockshelter	Metate, lithics, bone and charcoal	Unknown/Undetermined

The alternative routes for the project are made up of unique combinations of 19 segments and utilized 1 of 3 potential substation locations. Each substation site and route segment was individually examined for the number and type of previously recorded cultural resource sites that are either crossed by or located within 1,000 ft of each potential substation site and alternative route (see tables 7-1 and 7-2, respectively). During the record and literature review, 41BX1695 and 41BX1696 were identified as being within 1,000 ft of segments 11, 12, and 13. Additionally,

Segment 11 is also within 1,000 ft of 41BX746. Sites 41BX1695 and 41BX1696 were identified by Atkins during an impact evaluation conducted for the widening of US 281 from Loop 1604 to Cibolo Creek. Both sites were identified as lithic scatters containing tested cobbles, modified flakes, and debitage. Additionally, 41BX1695 contained a preform and a Plainview-like dart point basal fragment, while 41BX1696 contained a Pedernales-like dart point base fragment (Ellis et al., 2009). Both of these sites have been determined ineligible for inclusion in the NRHP. Site 41BX746, recorded in the mid-1980s, is an occupation site containing a burned rock midden, multiple diagnostic dart, and arrow projectile points. Bulldozing at the site both revealed and partially destroyed the site (Ellis et al., 2009). The site has an unknown or undetermined eligibility for listing in the NRHP.

Site 41CM294 was identified as being within 1,000 ft of Segment 1, while 41BX1891 was identified as being within 1,000 ft of segments 16 and 21. Site 41CM294 (Wysoki Rockshelter, recorded in 2006 by the South Texas Archeological Association) is a deeply stratified, well-preserved small rockshelter containing a metate, lithics, bone, and charcoal. The site has an unknown or undetermined eligibility for inclusion in the NRHP. Site 41BX1891, recorded in 2011 by GTI Environmental, Inc., is an unknown prehistoric site containing a surface scatter of debitage and was identified during a survey for road improvements along Bulverde Road. The site has been determined ineligible for inclusion in the NRHP.

Of the cemeteries identified, Fritz Voges occurs within 1,000 ft of Segment 3, Weidner Cemetery within 1,000 ft of segments 4 and 9, Koch Cemetery within 1,000 ft of Segment 5, and the Heinrich Voges Cemetery within 1,000 ft of segments 7 and 8, as well as substation Site B. All of these cemeteries have been dedicated by the THC as HTCs. Cemeteries are eligible for designation as an HTC if it is at least 50 years old and worthy of recognition for its historical associations. Although impacts to these cemeteries are not anticipated as a result of any of the proposed substation sites or alternative routes as currently delineated, Atkins recommends that any proposed construction activity stay at least 75 ft away from the edge of a cemetery.

Finally, the Wilhelm Weidner RTHL was identified as being crossed by Segment 9 and within 1,000 ft of segments 4, 6, and 8 as well as substation Site B. Recorded Texas Historic Landmarks are designated historic structures worthy of preservation for their architectural integrity and historical association. The Wilhelm Weidner RTHL was designated in 1974 and consists of a stone two-story home modeled after an ancestral home in Germany as well as several ancillary features, including a barn and rock wall. Although not currently listed in the NRHP, for the purposes of this evaluation, the property is being considered as eligible for inclusion in the NRHP.

The criteria used for ranking the three substation locations from a cultural resources standpoint included containing or being within 1,000 ft of a cultural resource and secondly, the percent of the site estimated to have a high probability for containing previously unrecorded cultural resources. None of the three substation sites contained known cultural resources, and only Site B was within 1,000 ft of a known site: the Heinrich Voges HTC and the Wilhelm Weidner RTHL. Therefore, Site B

was ranked last. Sites A and C had 100% estimated HPA and 10% estimated HPA, respectively; thus, Site C was favored over Site A. From a cultural resources standpoint, Site C was ranked first, followed by sites A and B, respectively.

The criteria used for ranking the primary transmission line routes included proximity to the Wilhelm Weidner RTHL, the number of previously recorded sites within 1,000 ft of an alternative route, and the amount of HPA delineated along each of the alternative routes. The 18 alternative routes were grouped into 3 different groups prior to ranking. The first group was within 1,000 ft of one to six archeological sites. The second group was within 1,000 ft of the Wilhelm Weidner Homestead and five previously recorded archeological sites. The third group crossed the Wilhelm Weidner Homestead and was within 1,000 ft of six previously recorded archeological sites. Within each of these groups, the alternative routes were then ranked from least to most amount of HPA.

Of the 18 alternative routes, 6 routes (A1, A2, A3, A7, A8, and C1) were in group 1 as described above and are the six best routes from a cultural resources standpoint. These routes were further ranked by HPA as follows, with the better routes having the least amount of HPA: C1 (approximately 18,680 ft, or 3.54 miles), A7 (approximately 20,590 ft, or 3.90 miles), A2 (approximately 23,340 ft, or 4.42 miles), A3 (approximately 23,675 ft, or 4.48 miles), A1 (approximately 24,380 ft, or 4.62 miles), and A8 (approximately 25,560 ft, or 4.84 miles), respectively.

Eight routes (B1, B2, B3, B4, B5, B6, B7, and B8) were within 1,000 ft of the Wilhelm Weidner Homestead and five previously recorded archeological sites (group 2). Ranked by HPA, Route B5 ranked seventh with approximately 16,760 ft, or 3.17 miles of HPA, followed by Route B6 (approximately 17,095 ft, or 3.24 miles), Route B4 (approximately 17,800 ft, or 3.37 miles), Route B8 (approximately 18,980 ft, or 3.59 miles), Route B2 (approximately 19,300 ft, or 3.66 miles), Route B3 (approximately 19,635 ft, or 3.72 miles), Route B1 (approximately 20,340 ft, or 3.85 miles), and Route B7 (approximately 21,525 ft, or 3.85 miles), respectively.

Group three (routes A4, A5, A6, and A9) crossed the Wilhelm Weidner Homestead and was within 1,000 ft of six previously recorded archeological sites. Ranked by HPA, Route A5 (approximately 21,095 ft, or 4.00 miles) is ranked fifteenth, followed by Route A6 (approximately 21,430 ft, or 4.06 miles), Route A4 (approximately 22,135 ft, or 4.19 miles), and Route A9 (approximately 23,315 ft, or 4.42 miles), respectively.

Therefore, the overall ranking from most to least recommended from a cultural resources perspective is as follows: C1, A7, A2, A3, A1, A8, B5, B6, B4, B8, B2, B3, B1, B7, A5, A6, A4, and A9.

5.0 AGENCIES/OFFICIALS CONSULTED

The following local, state, and federal agencies and officials were contacted by letter on August 7, 2013, by CPS Energy and Atkins to solicit comments, concerns, and information regarding potential environmental impacts, permits, or approvals for the construction of CPS Energy's proposed substation and transmission line in Bexar and Comal counties, Texas. A map of the study area was included with each letter. Sample copies of the letters and responses received as of the date of this report are included in Appendix A.

Local

- City of San Antonio Mayor
- City of San Antonio Council Members
- City of San Antonio Economic Development Department
- City of San Antonio Department of Planning & Community Development
- City of San Antonio Department of Public Works
- Alamo Area Council of Governments (AACOG)
- Guadalupe-Blanco River Authority
- Edwards Aquifer Authority
- San Antonio River Authority
- San Antonio Water System (SAWS)
- San Antonio Conservation Society
- Superintendent, Judson ISD
- Superintendent, North East ISD
- Bexar County Economic Development
- Bexar County Judge
- Bexar County Commissioners
- Bexar County Justice of the Peace, Precinct 3
- Bexar County Farm Service Agency
- Bexar County Farm Bureau
- Bexar County Public Works Department
- Bexar County Chief of Staff
- City of Bulverde Mayor
- City of Bulverde City Administrator
- City of Bulverde Council Members

- City of Bulverde Public Works
- Bulverde Spring Branch Economic Development Corporation
- Superintendent, Comal ISD
- Caldwell-Hays-Comal County Farm Service
- Comal County Farm Bureau
- Comal County Economic Development
- Comal County Judge
- Comal County Commissioner, Precinct 2
- Comal County Justice of the Peace, Precinct 2
- City of Garden Ridge Mayor
- City of Garden Ridge City Administrator
- City of Garden Ridge Aldermen
- City of Garden Ridge Mayor Pro Tempore

State

- Texas Parks and Wildlife Department (TPWD), Wildlife Habitat Assessment Program
- Texas Water Development Board (TWDB)
- Texas Department of Transportation (TxDOT), Division of Aviation
- TxDOT, Environmental Affairs Division
- Texas Historical Commission (THC)
- TxDOT, District Engineer
- Texas Commission on Environmental Quality (TCEQ)
- Texas General Land Office (GLO)
- Texas State Senator, District 25
- Texas House Representative, District 122
- Texas House Representative, District 73

Federal

- Federal Aviation Administration (FAA)
- Natural Resources Conservation Service (NRCS), Texas State Office
- Environmental Protection Agency (EPA)
- Federal Emergency Management Agency (FEMA)
- U.S. Fish & Wildlife Service (FWS)
- U.S. Army Corps of Engineers (USACE), Fort Worth District

- U.S. Representative, District 21

As of the date of this report, written responses to the August 2013 letters have been received from TxDOT Aviation Division, Texas GLO, THC, TWDB, and TPWD (state); and FEMA, USACE, NRCS, and FWS (federal). In addition, verbal responses were received from the TCEQ (state) and FAA (federal).

5.1 RESPONSES FROM LOCAL AGENCIES/OFFICIALS

As of the date of this report, no written responses have been received from local agencies/officials.

5.2 RESPONSES FROM STATE AGENCIES/OFFICIALS

The TxDOT Aviation Division responded with a description of the Title 14, US Code, Part 77 of the FAA FAR, which requires notice to the FAA if the facility is to be constructed within certain conditions. They advised that one public-use airport is within or near the study area (Bulverde Airpark, 1T8), gave its coordinates, and added that no public use heliports are located in or near the study area. They concluded by saying that if the criterion of any of the FAR 77.9 rules are met by the proposed routing, the FAA must be notified in four copies by using FAA Form 7460-1, "Notice of Proposed Construction or Alteration." A website was provided whereby this form and supporting documents could be found, as well as instructions on how to file electronically.

The Texas GLO responded that based on the preliminary project study area, it does not appear that the GLO will have environmental issues or land use constraints at this time. When a final route/location has been determined, they requested to be contacted so they can assess the route/location and determine if the project will cross any streambeds or Permanent School Fund (PSF) land that would require an easement from their agency.

The THC responded that their letter serves as comment on the proposed undertaking from the Executive Director of the THC and the State Historic Preservation Officer. They stated that the review staff requires more information to complete their review. Their records indicate that numerous archeological sites have been previously recorded within the general project area, but professional archeological surveys have been limited. Currently, insufficient information exists to make a determination as to whether the proposed project has the potential to impact cultural resources in the area, or to determine whether a cultural resources survey is necessary. They requested a new coordination letter with a more defined project area, and with more established details. The THC referred to their Project Review section of their website for additional details.

The TWDB stated the agency's responsibilities, namely to plan for the state's water resources and provide affordable water and wastewater resources, planning, geographical data collection and dissemination, and financial and technical assistance services. They are not a regulatory agency and do not issue permits, and based on the map and information provided, they do not anticipate any

conflict with any recommended water management strategies in the regional or state water plans; therefore, they do not have any specific comments in regard to the proposed project.

TPWD provided a list of federally/state-listed species, species of concern, and special features/natural communities occurring within Bexar and Comal counties. They noted that a search of the Texas NDD revealed that the golden-cheeked warbler and a ground beetle, both federally listed as endangered, and the cascade caverns salamander and Comal blind salamander, both state listed as threatened, have been documented in and/or within 1.5 miles of the study area. TPWD also noted that a bat roost (Bracken Bat Cave), two vegetation communities and karst zones 1 and 2 also have been documented in and/or within 1.5 miles of the study area. TPWD provided a map of the project area and Element of Occurrence Records to assist in project planning. The agency recommended avoiding golden-cheeked warbler habitat and karst zones 1 and 2, and recommended using areas that have already been disturbed. They gave descriptions of the applicable federal regulations, including the ESA and the MBTA, and the state regulations, including the Parks and Wildlife Code, and recommendations as to how to best adhere to each. They requested a copy of the resulting environmental assessment prior to submittal to the PUC, if applicable.

In a phone conversation with Atkins, TCEQ requested the GPS coordinates of the four corners of the study area, which Atkins subsequently provided.

5.3 RESPONSES FROM FEDERAL AGENCIES/OFFICIALS

FEMA requested that the counties' floodplain administrators be contacted for the review and possible permit requirements for the project. They added that if the project were to be federally funded, they requested that it be in compliance with Executive Orders 11988 and 11990.

The USACE assigned the project SWF-2013-00379 to use for all future correspondence concerning this project. They noted that Atkins may be contacted for additional information about the request, but gave a list of references to find information in the meantime. They finalized the letter by stating that it is unlawful to start work without a Department of the Army permit, if one is required. This letter was followed by an email from the USACE requesting a jurisdictional determination for the project site.

The NRCS started by noting that their review is part of NEPA, and as required by the FPPA. Based on a provided map, a determination regarding the environmental effects of the proposed project cannot be made without knowing the exact location of the site, as approximately 4,500 acres of prime farmland occur in the area of interest. However, no hydric soils are listed. If the project is being funded by a federal agency, it may require an FPPA rating, but if federal funds or technical assistance are not involved, the project is exempt. NRCS also provided a pamphlet describing how to create a web soil survey online, and another page of text with sources for the NRCS FPPA and NRCS Conservation Easements for Texas.

The FWS attached guidelines from Section 7 of the ESA and provided an internet URL to find up-to-date federally listed species for Texas counties. The agency said that a qualified biologist should evaluate the proposed site for federally listed species habitat. The FWS continued that they are the principal federal agency charged with protecting habitat and enhancing populations of migratory birds that spend all or parts of their lives in the U.S., and gave some recommendation for resources. They then discussed the inherent issues with meteorological towers constructed in association with electric substations and how they can be problematic for birds. They recommended following the voluntary guidance set forth in one of their published documents and gave an internet URL to find the document. They stated that monitoring at these towers would provide insight into the effectiveness of the minimization measures, and they requested the results of any wildlife monitoring and any data obtained regarding wildlife mortality at towers associated with this project. They wrote that if power lines are proposed, the FWS recommends the installation of underground rather than overhead power lines wherever possible. For new overhead lines or retrofitting of old lines, they recommend that project developers implement the Avian Power Line Interaction Committee guidelines. They concluded by giving the project the Service Consultation number 02ETAU00-2013-CPA-0032, for future reference.

The FAA, in a phone conversation with Atkins, notified Atkins of its website where the FAA notice criteria are located.

6.0 PUBLIC OPEN-HOUSE MEETING

CPS Energy held a public open house meeting for its Bulverde substation and transmission project. The meeting was held at St. Paul Lutheran Church on October 15, 2013. Landowners within 300 ft of all alternative routes were invited, as well as neighborhood associations, area residents, and local elected officials. Apart from the invitation letters, CPS Energy also publicized the meeting through local newspaper advertisements and through its website. The open-house meeting was intended to solicit comments from citizens, landowners, and public officials concerning the proposed project. The meeting had the following objectives:

- Promote a better understanding of the proposed project including the purpose, need, and potential benefits and impacts;
- Inform and educate the public with regard to the 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.

Information on public involvement is located in Appendix B.

At the open-house meeting, rather than a formal presentation in a speaker-audience format, CPS Energy representatives and Atkins staff utilized space by setting up several information stations. Each station was devoted to a particular aspect of the siting study and was manned by CPS Energy representatives and/or Atkins 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 areas of interest and ask specific questions. More importantly, the one-on-one discussions with CPS Energy representatives/Atkins staff encourage more interaction from those citizens who might be hesitant to participate in a speaker-audience format.

CPS Energy 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. The following is a summary of questionnaire responses received by CPS Energy at or before the announced CPS Energy deadline for returning completed questionnaires.

A total of 22 citizens/landowners signed in at the public open house meeting held at St. Paul Lutheran Church on October 15, 2013. CPS Energy received 15 questionnaires. Seven questions were asked on the questionnaire, the first of which was if the need for the project had been adequately explained. Nine of the 15 respondents (60%) indicated that the need for the project had been adequately explained, while 6 respondents (40%) indicated that it had not been adequately

explained. The second question asked respondents to rank a list of factors that they believed should be considered in the siting of the substation and transmission line. These factors included proximity to residential areas; floodplains/wetlands; recreational/park areas; archeological/historical sites; commercial/industrial areas; wildlife habitat/woodlands; schools; and churches/cemeteries. The responses, from most important to least important, were:

- Residential areas;
- Wildlife habitat/woodlands;
- Archeological/historical sites;
- Churches/cemeteries;
- Schools;
- Floodplains/wetlands;
- Recreational/park areas; and
- Commercial/industrial areas.

The third question asked if any other factors should be considered. Eleven of the 15 respondents (73%) answered this question, with the following responses (because some respondents had more than one response, the number of responses exceeds the number of respondents):

- Property/house values (4 respondents);
- Health (3 respondents);
- Aesthetics (2 respondents);
- Possibility of joint power contract with Pedernales Electric Cooperative (PEC) to remove need for CPS to build a substation, or have PEC build a substation on the north end and have CPS own the transformers with distribution lines;
- Power lines running through the property;
- Impact to the existing residential areas;
- Will shut down landowner's proposed subdivision, devalue property, prevent them from being able to sell, could destroy heritage oaks and graveyard (attachment, including a proposed subdivision plat, was provided with questionnaire, and is summarized in greater detail at the end of this section);
- Historical value – stone walls built by German immigrants; train tracks where buggy wagons once travelled; and
- Geology – this is a cavernous area and a recharge zone.

The fourth question asked respondents to identify substation site options and route segments that they believed would have a significant impact on people or the natural environment, as well as why and/or how. Thirteen of the 15 respondents (87%) answered this question, with the following responses:

- Any US 281 route could potentially create future issues with highway expansion;
- Substations A, C, and D would have impact on the natural environment;
- Substations C and D and segments 5, 19, and 20 would severely impact the natural environment;
- Substation A's location at/near the US 281 and FM 1863 intersection will limit development in what appears to be prime community property. Substation B's location near US 281 can also limit community development and affect wildlife;
- Segment 5 – would like for this segment to be at least 1 mile away from Verde Mountain Estates (2 respondents);
- Segment 5 – affects future subdivision development, approximately 6–8 lots (see attachment description at the end of this section);
- Segment 5 – would have significant negative effect on the existing residence as it appears to come very close;
- Segment 5 (2 responses with no further explanation);
- Bulverde Station (no ID given) is not suitable or desirable. It will negatively impact wildlife, natural historical features maintained by local property managers. The community is surrounded by a wildlife refuge and a huge animal shelter. Ancient stone walls have been preserved to ensure historical meaning. The community has remained small purposely and most tenants are personally connected to the first owners of the land;
- Segment 2 is too close to homes and with historical sites, and substation B is too close to residential lots;
- Substation A, segments 2, 9, and 10 – residential, crosses historic rock fences, aquifer recharge features, cave, designated 1880s plus cemeteries, devalue property values, sight pollution, radiation – electric and magnetic field (EMF), disrupt wildlife patterns and habitats, disrupt livestock, loss of pasture and grazing areas for livestock, destruction of century oak trees;
- Substation B, segments 8, 9, and 10 – residential, crosses historic rock fences, devalues property, 6 generation-owned home is a registered Texas Historic Landmark and includes a second home and barn – one of two full story rock homes in Comal County, devalue property, sight pollution, radiation – EMF, disrupt wildlife patterns and habitats, disrupt livestock, loss of pasture and grazing areas for livestock; and
- Substations A and B and Segment 2.

The fifth question asked respondents how they learned of the public open house meeting. All 15 respondents (100%) answered this question, with the following responses:

- Received invitation letter from CPS Energy (9 respondents);
- Notified by neighbor (4 respondents);
- Phone call from the office (1 respondent); and
- Internet and friends (1 respondent).

The sixth question asked respondents if they had any additional comments or questions. Nine of the 15 respondents (60%) replied to this question, with the following responses:

- I prefer you locate the substation at A or B, utilizing route 7, 11, 12, and 16;
- Please send EMF information and home value data after poles are installed, and don't use silver poles;
- Need more than one meeting, needs answers to proposed subdivision inquiries;
- Has worked with said future developer for many years, she has a strong work ethic and has spent over a year of her time and over $100,000 pursuing subdivision. Spent months working with MPC over entrance gate variance, has numerous heritage oaks. Line is close to her house and down her narrow easement to her property;
- The Hill Country and Bulverde are building at a rapid rate. It is vital to the history of San Antonio to preserve the history in which this city was built and respect the ancestral passage to this city. Destroying it or crowding its natural beauty will not only diminish its value, but will lessen the significance of its existence. It is our charge to ensure we continue to uphold the values of our ancestors, teach the youth of their history, and maintain the pure goodness of what is in our control;
- Destroy habitat, cut off from neighbors;
- Use established 281 routes;
- Suggested routes: Substation A (segments 1 and 7) and Substation B (segments 6 and 7) – right-of-way already for TxDOT. Substation C (segments 17, 19, and 20) and Substation D (segments 18, 19, and 20) – right-of-way already on Lower Smithson Valley Rd; and
- Our street is Ancestral Trail not Angel Trail.

The seventh and final question on the questionnaire asked respondents if they would like someone to follow up with them to discuss the project in more detail. Five of the 15 respondents (33%) replied “no,” and 10 of the 15 respondents (67%) replied “yes.”

In addition to the questionnaires and the attachment, CPS Energy received an email from a concerned landowner. This landowner expressed opposition to crossing their property and requested that CPS follow the roads that are already cleared by the state. They reiterated that alternatives were available and not to cross their farmland and affect wildlife.

The attachment: The landowner has a route segment running through their property and down their driveway, or adjacent to their driveway, which is approximately 0.5 mile in length. They have 45 acres of land, of which they began planning a subdivision for in 2007, with final stages to break ground in 2008. They sent a letter of intent to adjacent neighbors to inform them, but due to the downturn in the housing market and because another neighbor began to develop property with 28 sites, postponed the development. They planned to resume when they knew the rate of sale from his property. The landowner states that they spent over $100,000 between planning the subdivision, meeting with engineers, lawyers, accountants, surveyors, administrators working with

the City of San Antonio, and a city arborist. They also have applied for and received three names for the subdivision, street name guidelines, applied for and received PUD 08-001, met with SAWS, received a new service delivery subdivision development package from CPS, incorporated as an LLC, developed a document for Homeowners Association, conducted an environmental screening and produced aerial photographs, radius report, created elevation and drainage plans, consulted septic companies, and met with GVTC. They spent months on a design for the gated entranceway, received a gate variance from the Planning Commission, and spent $100,000 on the gate design. Transmission line poles could be potentially 4 ft from their driveway, which would be a deal killer for homebuyers looking for homes of $500,000 and up, as well as driving hazard. The landowner estimates from their lot layout that the proposed project would come across at least six to eight lots, making development impossible. They also have a cemetery that dates back to the 1800s (record is incorrectly positioned on map), and many Heritage Oaks that range from 3 to 6 ft in diameter (landowner enclosed photos of trees). The landowner also enclosed topographic maps, correspondence with an engineering design studio and attorneys, as well as the City of San Antonio Department of Development Services (for the Tree Preservation Ordinance), an environmental screening, and a property appraisal.

7.0 PREFERRED SITE AND ROUTE SELECTION

Atkins, with review and assistance from CPS Energy, evaluated four potential substation sites and numerous preliminary alternative route segments for the proposed Bulverde substation and transmission project, based on environmental/land use criteria and agency and public input. CPS Energy also took into consideration engineering, construction cost, operation, and maintenance factors, as well as future needs. The resulting potential substation sites and route segments were presented to the general public at an open-house meeting held in October 2013. As a result of these evaluations and public input received at the open house, CPS Energy and Atkins selected 3 potential substation sites and 18 primary alternative routes for further analysis. These 3 sites and 18 primary routes were subjected to a detailed environmental analysis by Atkins, and to an engineering, cost, and future needs analysis by CPS Energy. A preferred site and route were selected from these 3 sites and 18 primary alternative routes.

7.1 ATKINS' ENVIRONMENTAL EVALUATION

Atkins used a consensus process to evaluate the potential environmental impact of the alternative routes. Atkins professionals with expertise in different environmental disciplines (terrestrial and aquatic ecology, land use/planning, and cultural resources) evaluated the 3 sites and 18 primary alternative routes. This evaluation was based on data collected for 32 separate environmental criteria for the substation sites and 45 environmental criteria for the primary alternative routes, as well as comments from local, state, and federal agencies; public involvement; and field reconnaissance of the study area, proposed substation sites, and alternative routes. The amount or number of each environmental criterion measured for the substation sites is presented in Table 7-1, while the amount or number of each environmental criterion measured along the primary alternative routes is presented in Table 7-2. Each person on the evaluation team independently analyzed the sites and 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 of the substation sites included aesthetics and the proximity to habitable structures (i.e., residences, businesses, schools, churches, hospitals, nursing homes, etc.). For the route evaluation, length paralleling existing ROW and proximity to habitable structures were the main factors considered. The main factors considered important in the ecological evaluation were the potential impact on endangered species, impact on woodland, overall length, and impact on the EARZ. The cultural resources evaluation focused on the proximity of known cultural resource sites and the amount 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 site and 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 3 substation sites and all 18 primary alternative routes in order

TABLE 7-1
ENVIRONMENTAL DATA FOR SITE EVALUATION
BULVERDE SUBSTATION

	LAND USE	Site A	Site B	Site C
1.	Number of habitable structures[1] within site footprint	(0 residential)	(0 residential)	(0 residential)
		(0 commercial)	(0 commercial)	(0 commercial)
2.	Number of habitable structures[1] within 300 ft of site	(0 residential)	(0 residential)	(0 residential)
		(0 commercial)	(4 commercial)	(0 commercial)
3.	Number of schools within 1,000 ft of site	0	0	0
4.	Number of parks/recreational areas[2] in or within 1,000 ft of site	0	0	0
5.	Number of FAA-registered airports within 20,000 ft of site	1	1	0
6.	Number of private airstrips within 10,000 ft of site	0	0	1
7.	Number of heliports within 5,000 ft of site	0	0	0
8.	Number of commercial AM radio transmitters within 10,000 ft of site	0	0	0
9.	Number of FM radio transmitters, microwave, and other electronic installations within 2,000 ft of site	1	0	2
	AESTHETICS			
10.	Is site within foreground visual zone[3] of U.S. and/or state highways?	Yes	Yes	No
11.	Is site within foreground visual zone[3] of FM roads?	Yes	No	No
12.	Is site within foreground visual zone[3] of parks/recreational areas[2]?	No	No	No
13.	Is site within foreground visual zone[3] of churches, schools, and cemeteries?	Yes	Yes	No
	ECOLOGY			
14.	Percent of site in upland woodland/brushland	75	50	20
15.	Percent of site in bottomland/riparian woodland	0	0	0
16.	Percent of site in potential wetlands (including bottomland wetlands)	0	0	0
17.	Is site in potential golden-cheeked warbler habitat?	No	No	No
18.	Is site within 300 ft of potential golden-cheeked warbler habitat?	No	No	Yes
19.	Is site in potential black-capped vireo habitat?	No	No	No
20.	Is site within 300 ft of potential black-capped vireo habitat?	No	No	No
21.	Is site in an area known to contain endangered karst invertebrate species (Zone 1)	No	No	No
22.	Is site in an area having a high probability of containing endangered karst invertebrate species (Zone 2)	No	No	No
23.	Is site in a critical habitat unit for endangered karst invertebrates?	No	No	No
24.	Is site within 500 ft of a known karst feature?	No	No	No
25.	Is site in a 100-year floodplain?	No	No	No
26.	Is site in the Edwards Aquifer Recharge Zone[4]?	No	No	No
27.	Is site in the Edwards Aquifer Contributing Zone[5]?	Yes	Yes	Yes
	CULTURAL RESOURCES			
28.	Number of recorded historic and prehistoric sites within site	0	0	0
29.	Number of recorded historic and prehistoric sites within 1,000 ft of site	0	1	0
30.	Number of National Register-listed, determined-eligible, or potentially eligible sites within site	0	0	0
31.	Number of National Register-listed, determined-eligible, or potentially eligible sites within 1,000 ft of site	0	1	0
32.	Percent of site in areas of high archeological/historical site potential	100	0	10

Note: All length measurements in feet.

[1] Single-family and multi-family dwellings and related structures, mobile homes, apartment buildings, commercial structures, industrial structures, business structures, churches, hospitals, nursing homes, schools, or other structures normally inhabited by humans or intended to be inhabited by humans on a daily or regular basis.

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

[3] One-half mile, unobstructed.

[4] Water Pollution Abatement Plan (WPAP) required.

TABLE 7-2
ENVIRONMENTAL DATA FOR ALTERNATIVE ROUTE EVALUATION
BULVERDE TRANSMISSION PROJECT

		Routes																	
	LAND USE	**A1**	**A2**	**A3**	**A4**	**A5**	**A6**	**A7**	**A8**	**A9**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**C1**
1.	Length of alternative route	26,575	25,505	25,840	28,310	27,245	27,580	26,525	27,755	29,495	21,395	20,330	20,665	21,765	20,700	21,030	22,580	22,950	22,965
2.	Number of habitable structures[1] within ROW	1	1	0	1	1	0	0	0	0	1	1	0	1	1	0	0	0	0
3.	Number of habitable structures[1] within 300 ft of ROW centerline	42	46	29	34	38	21	20	30	22	36	40	23	36	40	23	23	24	21
4.	Length of ROW parallel to existing ROW (highway, road, pipeline, etc.)	17,330	14,290	12,480	17,025	13,985	12,175	16,625	15,520	15,215	15,815	12,775	10,965	13,735	10,695	8,885	14,005	11,925	21,265
5.	Length of ROW parallel to property lines not following existing ROW[2]	1,580	1,370	3,005	6,755	6,545	8,180	1,845	3,705	8,880	920	710	2,345	5,405	5,195	6,830	3,045	7,530	0
6.	Number of parks/recreational areas[3] crossed by ROW	0	0	1	0	0	1	1	1	1	0	0	1	0	0	1	1	1	1
7.	Length of ROW across parks/recreational areas[3]	0	0	60	0	0	60	60	60	60	0	0	60	0	0	60	60	60	60
8.	Number of parks/recreational areas[3] within 1,000 ft of ROW centerline	1	1	0	1	1	0	0	0	0	1	1	0	1	1	0	0	0	0
9.	Length of ROW across cropland	0	0	0	345	345	345	0	0	345	0	0	0	0	0	0	0	0	0
10.	Length of ROW across rangeland/pastureland	18,160	17,360	17,595	21,970	21,170	21,405	22,885	18,775	22,585	14,315	13,515	13,750	15,965	15,165	15,400	14,930	16,575	22,170
11.	Length of ROW across land irrigated by traveling systems (rolling or pivot type)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12.	Number of pipeline crossings	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1
13.	Number of transmission line crossings	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.	Number of U.S. and state highway crossings	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2	2	2	0
15.	Number of Farm-to-Market and Ranch-to-Market road crossings	0	0	0	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0
16.	Number of FAA-registered airports within 10,000 ft of ROW centerline (with runway <3,200 ft)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
17.	Number of FAA-registered airports within 20,000 ft of ROW centerline (with runway >3,200 ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18.	Number of private airstrips within 10,000 ft of ROW centerline	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
19.	Number of heliports within 5,000 ft of ROW centerline	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
20.	Number of commercial AM radio transmitters within 10,000 ft of ROW centerline	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21.	Number of FM radio transmitters, microwave relay stations, or other electronic installations, within 2,000 ft of ROW	5	5	3	5	5	3	1	3	3	4	4	2	4	4	2	2	2	3
	AESTHETICS																		
22.	Estimated length of ROW within foreground visual zone[4] of U.S. and State highways	25,800	24,730	23,920	23,875	22,805	21,990	2,535	25,835	23,910	20,620	19,555	18,740	20,990	19,925	19,110	20,655	21,025	0
23.	Estimated length of ROW within foreground visual zone[4] of Farm-to-Market roads	4,325	4,325	4,325	2,825	2,825	2,825	2,825	4,325	2,825	0	0	0	0	0	0	0	0	0
24.	Estimated length of ROW within foreground visual zone[4] of parks/recreational areas	9,115	9,115	9,445	6,135	6,135	6,460	3,330	9,445	6,460	9,395	9,395	9,720	9,465	9,465	9,795	9,720	9,795	3,330
25.	Estimated length of ROW within foreground visual zone[4] of churches, schools, and cemeteries	13,975	13,975	13,975	15,835	15,835	15,835	11,025	13,975	15,835	9,745	9,745	9,745	10,115	10,115	10,115	9,745	10,115	0
	ECOLOGY																		
26.	Length of ROW across upland woodland/brushland	10,755	10,740	10,245	10,780	10,770	10,275	11,675	10,720	10,745	8,380	8,365	7,870	8,265	8,250	7,755	8,345	8,225	12,605
27.	Length of ROW across bottomland/riparian woodland	1,135	755	985	1,300	920	1,150	955	1,365	1,530	1,135	755	985	1,135	755	985	1,365	1,365	1,250
28.	Length of ROW across potential wetlands (including bottomland wetlands)	10	10	10	10	10	10	130	10	10	10	10	10	10	10	10	10	10	245
29.	Length of ROW across known/occupied habitat of golden-cheeked warbler or black-capped vireo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30.	Length of ROW within 300 ft of known/occupied habitat of golden-cheeked warbler or black-capped vireo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31.	Length of ROW across potential habitat of golden-cheeked warbler or black-capped vireo	0	0	0	0	0	0	1,685	0	0	0	0	0	0	0	0	0	0	5,400
32.	Length of ROW within 300 ft of potential habitat of golden-cheeked warbler or black-capped vireo	0	0	0	0	0	0	2,785	0	0	0	0	0	0	0	0	0	0	7,390
33.	Length of ROW across areas known to contain endangered karst invertebrate species (Zone 1)	1,335	1,335	0	1,335	1,335	0	0	0	0	1,335	1,335	0	1,335	1,335	0	0	0	0
34.	Length of ROW across areas having a high probability of containing endangered karst invertebrate species (Zone 2)	3,675	3,365	5,035	3,675	3,365	5,035	5,555	6,190	6,190	3,675	3,365	5,035	3,675	3,365	5,035	6,190	6,190	5,555
35.	Length of ROW across open water (lakes, ponds)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36.	Number of stream crossings	8	6	7	8	6	7	9	11	11	7	5	6	7	5	6	10	10	10
37.	Length of ROW parallel to and within 100 ft of streams	765	490	0	765	490	0	895	270	270	765	490	0	765	490	0	270	270	720
38.	Length of ROW across 100-year floodplains	3,165	3,165	2,185	4,630	4,630	3,650	4,000	2,185	3,650	2,820	2,820	1,840	3,790	3,790	2,810	1,840	2,810	620
39.	Length of ROW across Edwards Aquifer Recharge Zone[5]	10,835	10,270	10,605	13,095	12,530	12,865	11,875	12,015	14,280	10,585	10,020	10,355	9,990	9,425	9,760	11,765	11,175	6,815
40.	Length of ROW across Edwards Aquifer Contributing Zone[6]	15,740	15,240	15,240	15,215	14,715	14,715	14,650	15,740	15,215	10,810	10,310	10,310	11,775	11,270	11,270	10,810	11,775	16,150
	CULTURAL RESOURCES																		
41.	Number of recorded historic and prehistoric sites crossed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42.	Number of recorded historic and prehistoric sites within 1,000 ft of ROW centerline	6	6	6	6	6	6	3	6	6	5	5	5	5	5	5	5	5	1
43.	Number of National Register-listed, determined-eligible, or potentially eligible sites crossed	0	0	0	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0
44.	Number of National Register-listed, determined-eligible, or potentially eligible sites within 1,000 ft of ROW centerline	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0
45.	Length of ROW across areas of high archeological/historical site potential	24,380	23,340	23,675	22,135	21,095	21,430	20,590	25,560	23,315	20,340	19,300	19,635	17,800	16,760	17,095	21,525	18,980	18,680

Note: All length measurements in feet.

[1] Single-family and multi-family dwellings and related structures, mobile homes, apartment buildings, commercial structures, industrial structures, business structures, churches, hospitals, nursing homes, schools, or other structures normally inhabited by humans or intended to be inhabited by humans on a daily or regular basis.

[2] Property lines created by existing road, highway, or railroad ROW are not "double counted."

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

[4] One-half mile, unobstructed.

[5] Water Pollution Abatement Plan (WPAP) required.

[6] Contributing Zone Plan required if more than 5 acres of disturbance (including access roads).

of their potential environmental impact. These rankings are shown in tables 7-3 and 7-4, respectively.

7.1.1 Substation Site Evaluation

Although all three potential substation sites evaluated in this report are environmentally acceptable sites, it is the consensus of the Atkins evaluators that Site B is the most favorable site after evaluating the objective criteria.

TABLE 7-3

ENVIRONMENTAL RANKING OF PRIMARY ALTERNATIVE SITES
BULVERDE SUBSTATION AND TRANSMISSION PROJECT

	Site			
Ranking	Land Use	Ecology	Cultural Resources	Consensus
1st	C	B	C	B
2nd	A	A	A	A
3rd	B	C	B	C

From a land use perspective, Site C was ranked first, followed by sites A and B, respectively. Site C would have the least impact on aesthetics. Along with Site A, Site C has no habitable structures either within the footprint or within 300 ft of the footprint. Site B on the other hand is within 300 ft of four habitable structures (all commercial) and was ranked last.

The ecology evaluator based the assessment on the percentage of the site that would require clearing of woodland habitat and the proximity of the site to potential golden-cheeked warbler habitat. Substation Site B is the most favorable site from an ecological perspective because it would require the second-least amount of woodland habitat clearing (50% of substation site) and is not located within 300 ft of any potential federally endangered golden-cheeked warbler habitat. Substation Site A is ranked second from an ecological standpoint, followed by Substation Site C. While Substation Site A would require the greatest amount of woodland habitat clearing (75% of substation site), it is not located within 300 ft of any potential golden-cheeked warbler habitat, and although Substation Site C would require the least amount of woodland clearing (20% of substation site), it is located within 300 ft of potential golden-cheeked warbler habitat, thus making it the least favorable site from an ecological standpoint.

The criteria used for ranking the three substation locations from a cultural resources standpoint included containing or being within 1,000 ft of a cultural resource and secondly, the percent of the site estimated to have a high probability for containing previously unrecorded cultural resources. None of the three substation sites contained known cultural resources, and only Site B was within 1,000 ft of a known site: the Heinrich Voges HTC and the Wilhelm Weidner RTHL. Therefore, Site B was ranked last. Sites A and C had 100% estimated HPA and 10% estimated HPA, respectively; thus

Site C was favored over Site A. From a cultural resources standpoint, Site C was ranked first, followed by sites A and B, respectively.

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 Site B is the first choice, followed by sites A and C, respectively. The group put most weight on endangered species. While none of the sites was located in endangered species habitat, Site C was the only site located within 300 ft of potential habitat for the golden-cheeked warbler and thus was ranked last. Site B was preferred to Site A, because no part of the site was considered to contain HPA, whereas the entirety of Site A was considered to contain HPA. Furthermore, Site B would require removal of less woodland than Site A.

7.1.2 Route Evaluation

Although all 18 alternative routes evaluated in this report are environmentally acceptable routes, it is the consensus of Atkins evaluators that Route B1 is the most favorable alternative after evaluating the objective criteria.

TABLE 7-4

ENVIRONMENTAL RANKING OF PRIMARY ALTERNATIVE ROUTES
BULVERDE SUBSTATION AND TRANSMISSION PROJECT

	Route			
Ranking	Land Use	Ecology	Cultural Resources	Consensus
1st	C1	B5	C1	B1
2nd	B1	B2	A7	A1
3rd	B4	B6	A2	B2
4th	B2	B3	A3	A2
5th	B5	B4	A1	B3
6th	A1	B1	A8	B7
7th	A2	B8	B5	A3
8th	B7	B7	B6	B4
9th	B3	A2	B4	B8
10th	B8	A3	B8	B5
11th	B6	A5	B2	B6
12th	A4	A1	B3	A4
13th	A5	A6	B1	A5
14th	A3	A4	B7	A6
15th	A6	A8	A5	A8
16th	A8	A9	A6	A9
17th	A9	A7	A4	A7
18th	A7	C1	A9	C1

The evaluation of potential land use impacts focused on existing land use and development patterns within the study area. Routes that parallel compatible ROW, particularly major roadway corridors, were preferred to the alternatives that extend across open, undeveloped land. Although the alternatives that parallel US 281 have greater numbers of habitable structures located within 300 ft of their centerlines (a good portion of which are commercial structures), they would cause less land use disturbance as compared to routes that do not parallel corridors. Route C1 is the preferred route from a land use perspective, as it parallels the greatest length of compatible ROW (approximately 4.3 miles, or 93% of its total length), is only 0.5 mile longer than the shortest alternative, and has the second-fewest number of habitable structures located within 300 ft (21). Routes B2 and B4 were ranked second and third by the land use evaluator, respectively. Route B1 is only 1,056 ft longer than the shortest alternative and parallels compatible ROW for approximately 75% of its total length, while Route B4 is only 1,435 ft longer than the shortest route and parallels compatible ROW for approximately 64% of its total length. Both Route B1 and Route B4 have 36 habitable structures located within 300 ft (13 of which are commercial).

Conversely, Route A7 is the least favorable alternative from a land use perspective. Although it actually has the fewest number of habitable structures located within 300 ft, it traverses the greatest amount of undeveloped land and parallels major roadways to a much lesser degree. It would therefore create a greater intrusion into the landscape and impact land use to a greater degree by introducing an additional major infrastructure corridor through undeveloped land that is surrounded by residential subdivisions.

Route B5 is the most favorable route from an ecological perspective, because it does not cross any potential federally endangered golden-cheeked warbler habitat, or have potential habitat within 300 ft of the ROW, crosses the third-least amount of woodland habitat, and is the third-shortest alternative route. Furthermore, Route B5 crosses the fewest streams and least amount of wetlands, and crosses the second-least amount of the EARZ. Route B2 is ranked second from an ecological standpoint, followed by Route B6. As with Route B5, routes B2 and B6 do not cross any potential golden-cheeked warbler habitat, or have potential habitat within 300 ft of the ROW, and cross the least amount of wetlands. Route B2 crosses the fourth-least amount of woodland habitat, is the shortest alternative route, and crosses the fifth-least amount of EARZ. Route B6 crosses the least amount of woodland habitat, is the fourth-shortest alternative route, and crosses the third-least amount of EARZ. Route C1 is the least favorable from an ecological standpoint. It crosses the most potential golden-cheeked warbler habitat, and is within 300 ft of the most potential habitat; it crosses the greatest amount of woodland habitat, and crosses the greatest amount of wetlands.

The criteria used for ranking the 18 primary routes from a cultural resources standpoint included proximity to the Wilhelm Weidner RTHL, the number of previously recorded sites within 1,000 ft of an alternative route, and the amount of HPA delineated along each of the alternative routes. The 18 alternative routes were grouped into 3 different groups prior to ranking. The first group was within 1,000 ft of one to six archeological sites. The second group was within 1,000 ft of the Wilhelm

Weidner Homestead and five previously recorded archeological sites. The third group crossed the Wilhelm Weidner Homestead and was within 1,000 ft of six previously recorded archeological sites. Within each of these groups, the alternative routes were then ranked from least to most amount of HPA.

Of the 18 alternative routes, 6 routes (A1, A2, A3, A7, A8, and C1) were in group 1 as described above and are the 6 best routes from a cultural resources standpoint. These routes were further ranked by HPA as follows, with the better routes having the least amount of HPA: C1 (approximately 18,680 ft, or 3.54 miles), A7 (approximately 20,590 ft, or 3.90 miles), A2 (approximately 23,340 ft, or 4.42 miles), A3 (approximately 23,675 ft, or 4.48 miles), A1 (approximately 24,380 ft, or 4.62 miles), and A8 (approximately 25,560 ft, or 4.84 miles), respectively. The four worst routes were A4, A5, A6, and A9 because they crossed the Wilhelm Weidner Homestead and were within 1,000 ft of six previously recorded archeological sites. Ranked by HPA, Route A9 (approximately 23,315 ft, or 4.42 miles) was ranked last (eighteenth), while Route A4 (22,135 ft, or 4.19 miles) was ranked seventeenth, Route A6 (21,430 ft, or 4.06 miles) was ranked sixteenth, and Route A5 (21,095 ft, or 4.00 miles) was ranked fifteenth.

Based on a subsequent group discussion of the evaluations by discipline and the relative importance of each set of criteria (human, cultural, and cultural), the group selected Route B1 as the recommended preferred route, followed by routes A1 and B2, respectively. Route B1 was ranked first because it parallels road ROW for a large portion of its length. Many of the habitable structures within 300 ft are commercial. Route A1 was ranked second because it is the same route as B1 except that it is a little longer. Similarly, Route B2 was ranked third ahead of Route A2 (ranked fourth) because it is essentially the same route except that it is shorter. Route C1 was ranked last because of potential issues with golden-cheeked warbler habitat.

7.2 CPS ENERGY'S EVALUATION

The CPS Energy evaluation team has expertise in utility management, engineering, system planning, environmental stewardship, and ROW management. CPS Energy's evaluation categories included environment and land use (based on Atkins' evaluation), cost, engineering (which includes feasibility, operations, and maintenance), and public input. The team's goal in choosing a substation site and transmission line route was to minimize the impact to the environment, landowners, and rate paying customers while optimizing constructability and operation and maintenance concerns.

CPS Energy used a short list and consensus process to evaluate the 3 substation sites (sites A, B, and C) and 18 primary routes. The CPS Energy team eliminated site/routes A4, A5, A6, A7, A8, A9, and C1 because of their poor environmental ranking as determined by Atkins' evaluation. The CPS Energy team eliminated routes A1, A2, A3, A4, A6, A8, B7, and B8 because they were the highest cost. Higher costs were generally associated with the longer transmission routes or type of property (commercial, residential, or agricultural).

The CPS Energy evaluation team selected Site B/Route B1 as the overall preferred site/route. This site/route:

- is ranked first environmentally;
- is the second choice substation site for Distribution Planning;
- is lower in cost;
- is the fifth-shortest route, following established corridors and property lines; and
- avoids endangered species habitat and residential areas.

Table 7-5 provides data for each route sorted by estimated cost (lowest to highest cost).

TABLE 7-5

ESTIMATED COST AND LENGTH OF THE 18 PRIMARY SITES/ROUTES (ROUNDED)

Route	Cost ($ millions)	Length (miles)	Route Segments
A7	33.5	5.02	3-5-20-21
C1	38.4	4.35	17-19-20-21
B5	39.5	3.92	8-10-11-13-14-16
B6	39.6	3.98	8-10-11-13-15-21
B2	39.6	3.85	6-7-11-13-14-16
B3	39.6	3.91	6-7-11-13-15-21
B4	41.1	4.12	8-10-11-12-16
B1	41.5	4.05	6-7-11-12-16
A9	41.6	5.59	3-4-9-10-11-12-14-15-21
A5	41.6	5.16	3-4-9-10-11-13-14-16
A6	41.9	5.22	3-4-9-10-11-13-15-21
B7	42.5	4.28	6-7-11-12-14-15-21
B8	42.6	4.35	8-10-11-12-14-15-21
A4	42.9	5.36	3-4-9-10-11-12-16
A3	46.1	4.89	1-7-11-13-15-21
A2	46.2	4.83	1-7-11-13-14-16
A1	47.9	5.03	1-7-11-12-16
A8	49.0	5.26	1-7-11-12-14-15-21

Habitable structures and other land use features in the vicinity of CPS Energy's recommended route (Route B1) are tabulated in Table 7-6 and shown on Figure 7-1 (map pocket). Habitable structures and other land use features in the vicinity of the other 17 routes are tabulated in tables 7-7 through 7-23, as well as being shown on Figure 7-1 (map pocket).

TABLE 7-6

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES IN THE VICINITY OF CPS ENERGY'S RECOMMENDED ROUTE (ROUTE B1) BULVERDE SUBSTATION AND TRANSMISSION PROJECT

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
9a	U-Haul office	86 N
9b	JP Motor Center "Quality Used Cars"	87 S
10	Single-family Residence	202 E
15	Single-family Residence	152 W
16	Single-family Residence	172 W
17	Single-family Residence	263 W
18	Hanson & Calson's Carpets, Inc.	214 S
19	Unknown commercial	114 E
22	Single-family Residence	232 NE
23	Ferrell Gas	199 NE
24	Rebecca Creek Distillery	118 SW
25	Boatner and Hamad Land & Title	215 SW
34	Walgreens	287 S
62	Warehouse	180 SW
63	Warehouse	49 SW
64	Warehouse	202 SW
65	Warehouse	179 SW
66	Warehouse	267 SW
67	Single-family Residence	279 N
68	Single-family Residence	274 N
69	Single-family Residence	263 N
70	Single-family Residence	260 N
71	Single-family Residence	253 N
72	Single-family Residence	255 N
73	Single-family Residence	265 N
74	Single-family Residence	267 N
75	Single-family Residence	262 N
76	Single-family Residence	256 N
77	Single-family Residence	244 N
78	Single-family Residence	179 S

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
79	Single-family Residence	195 S
80	Single-family Residence	216 S
81	Single-family Residence	203 S
82	Single-family Residence	203 S
83	Single-family Residence	215 S
84	Single-family Residence	211 S
85	Single-family Residence	214 S
86	Bulverde Airpark	2,930 W
92	SBC Tower Holdings, LLC	1,984 W
93	Crown Communication, LLC	792 S
94	KFLZ-LP-TV	1,473 S
95	KSSJ-LP TV	1,527 S
96	Access point to Cibolo Canyon (conservation easement)	0
97	Unknown heliport	3,833 S

[1]These structures and/or features are located on Figure 7-1 (map pocket).

TABLE 7-7

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES IN THE VICINITY OF ROUTE A1
BULVERDE SUBSTATION AND TRANSMISSION PROJECT

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
1	Single-family Residence	294 NW
2	Security State Bank and Trust	149 N
3	Chevron Gas Station	109 S
4	Commercial Center	160 S
5	Single-family Residence	182 S
6	St. Paul Lutheran Church	216 E
7	St. Paul Lutheran Day School	254 E
8	St. Paul Lutheran Office	61 E
10	Single-family Residence	202 E
15	Single-family Residence	152 W
16	Single-family Residence	172 W
17	Single-family Residence	263 W
18	Hanson & Calson's Carpets, Inc.	214 S
19	Unknown commercial	114 E
22	Single-family Residence	232 NE
23	Ferrell Gas	199 NE
24	Rebecca Creek Distillery	118 SW
25	Boatner and Hamad Land & Title	215 SW
34	Walgreens	287 S
62	Warehouse	180 SW
63	Warehouse	49 SW
64	Warehouse	202 SW
65	Warehouse	179 SW
66	Warehouse	267 SW
67	Single-family Residence	279 N
68	Single-family Residence	274 N
69	Single-family Residence	263 N
70	Single-family Residence	260 N
71	Single-family Residence	253 N
72	Single-family Residence	255 N
73	Single-family Residence	265 N

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
74	Single-family Residence	267 N
75	Single-family Residence	262 N
76	Single-family Residence	256 N
77	Single-family Residence	244 N
78	Single-family Residence	179 S
79	Single-family Residence	195 S
80	Single-family Residence	216 S
81	Single-family Residence	203 S
82	Single-family Residence	203 S
83	Single-family Residence	215 S
84	Single-family Residence	211 S
85	Single-family Residence	214 S
86	Bulverde Airpark	2,930 W
88	T Mobile West Corp	1,156 E
92	SBC Tower Holdings, LLC	1,984 W
93	Crown Communication, LLC	792 S
94	KFLZ-LP-TV	1,473 S
95	KSSJ-LP TV	1,527 S
96	Access point to Cibolo Canyon (conservation easement)	0
97	Unknown heliport	3,833 S

[1]These structures and/or features are located on Figure 7-1 (map pocket).

TABLE 7-8

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES IN THE VICINITY OF ROUTE A2
BULVERDE SUBSTATION AND TRANSMISSION PROJECT

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
1	Single-family Residence	294 NW
2	Security State Bank and Trust	149 N
3	Chevron Gas Station	109 S
4	Commercial Center	160 S
5	Single-family Residence	182 S
6	St. Paul Lutheran Church	216 E
7	St. Paul Lutheran Day School	254 E
8	St. Paul Lutheran Office	61 E
10	Single-family Residence	202 E
15	Single-family Residence	152 W
16	Single-family Residence	172 W
17	Single-family Residence	263 W
18	Hanson & Calson's Carpets, Inc.	215 S
20	Exxon Building	288 W
21	Exxon Gas Station	272 W
26	Reflections Taxidermy	290 W
27	for rent	283 W
28	Kerri's Closet	283 W
29	Dancing Glass Boutique and Bistro	292 W
30	Single-family Residence	235 W
31	Fix it Shop	227 W
32	Eclectic..??	131 W
33	Single-family Residence	123 W
62	Warehouse	180 SW
63	Warehouse	49 SW
64	Warehouse	202 SW
65	Warehouse	179 SW
66	Warehouse	267 SW
67	Single-family Residence	279 N
68	Single-family Residence	274 N
69	Single-family Residence	263 N

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
70	Single-family Residence	260 N
71	Single-family Residence	253 N
72	Single-family Residence	255 N
73	Single-family Residence	265 N
74	Single-family Residence	267 N
75	Single-family Residence	262 N
76	Single-family Residence	256 N
77	Single-family Residence	244 N
78	Single-family Residence	179 S
79	Single-family Residence	195 S
80	Single-family Residence	216 S
81	Single-family Residence	203 S
82	Single-family Residence	203 S
83	Single-family Residence	215 S
84	Single-family Residence	211 S
85	Single-family Residence	214 S
86	Bulverde Airpark	2,930 W
88	T Mobile West Corp	1,156 E
92	SBC Tower Holdings, LLC	1,984 W
93	Crown Communication, LLC	792 S
94	KFLZ-LP-TV	1,473 S
95	KSSJ-LP TV	1,527 S
96	Access point to Cibolo Canyon (conservation easement)	0
97	Unknown heliport	3,833 S

[1]These structures and/or features are located on Figure 7-1 (map pocket).

TABLE 7-9

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES IN THE VICINITY OF ROUTE A3
BULVERDE SUBSTATION AND TRANSMISSION PROJECT

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
1	Single-family Residence	294 NW
2	Security State Bank and Trust	149 N
3	Chevron Gas Station	109 S
4	Commercial Center	160 S
5	Single-family Residence	182 S
6	St. Paul Lutheran Church	216 E
7	St. Paul Lutheran Day School	254 E
8	St. Paul Lutheran Office	61 E
10	Single-family Residence	202 E
15	Single-family Residence	152 W
16	Single-family Residence	172 W
17	Single-family Residence	263 W
18	Hanson & Calson's Carpets, Inc.	215 S
20	Exxon Building	288 W
21	Exxon Gas Station	272 W
26	Reflections Taxidermy	290 W
27	for rent	283 W
28	Kerri's Closet	283 W
29	Dancing Glass Boutique and Bistro	292 W
30	Single-family Residence	235 W
31	Fix it Shop	227 W
32	Eclectic..??	131 W
33	Single-family Residence	123 W
56	Single-family Residence	91 S
57	Single-family Residence	106 S
58	Single-family Residence	142 S
59	Single-family Residence	224 S
60	Single-family Residence	246 SW
61	Single-family Residence	269 SW
86	Bulverde Airpark	2,930 W
88	T Mobile West Corp	1,156 E

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
92	SBC Tower Holdings, LLC	1,984 W
93	Crown Communication, LLC	1,235 S
96	Access point to Cibolo Canyon (conservation easement)	0
97	Unknown heliport	4,840 S

[1]These structures and/or features are located on Figure 7-1 (map pocket).

TABLE 7-10

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES IN THE VICINITY OF ROUTE A4
BULVERDE SUBSTATION AND TRANSMISSION PROJECT

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
14	Single-family Residence	110 E
15	Single-family Residence	152 W
16	Single-family Residence	172 W
17	Single-family Residence	263 W
18	Hanson & Calson's Carpets, Inc.	214 S
19	Unknown commercial	114 E
22	Single-family Residence	232 NE
23	Ferrell Gas	199 NE
24	Rebecca Creek Distillery	118 SW
25	Boatner and Hamad Land & Title	215 SW
34	Walgreens	287 S
62	Warehouse	180 SW
63	Warehouse	49 SW
64	Warehouse	202 SW
65	Warehouse	179 SW
66	Warehouse	267 SW
67	Single-family Residence	279 N
68	Single-family Residence	274 N
69	Single-family Residence	263 N
70	Single-family Residence	260 N
71	Single-family Residence	253 N
72	Single-family Residence	255 N
73	Single-family Residence	265 N
74	Single-family Residence	267 N
75	Single-family Residence	262 N
76	Single-family Residence	256 N
77	Single-family Residence	244 N
78	Single-family Residence	179 S
79	Single-family Residence	195 S
80	Single-family Residence	216 S
81	Single-family Residence	203 S

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
82	Single-family Residence	203 S
83	Single-family Residence	215 S
84	Single-family Residence	211 S
85	Single-family Residence	214 S
86	Bulverde Airpark	5,382 W
88	T Mobile West Corp	1,166 W
92	SBC Tower Holdings, LLC	1,984 W
93	Crown Communication, LLC	792 S
94	KFLZ-LP-TV	1,473 S
95	KSSJ-LP TV	1,527 S
96	Access point to Cibolo Canyon (conservation easement)	0
97	Unknown heliport	3,833 S

[1]These structures and/or features are located on Figure 7-1 (map pocket).

TABLE 7-11

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES IN THE VICINITY OF ROUTE A5
BULVERDE SUBSTATION AND TRANSMISSION PROJECT

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
14	Single-family Residence	110 E
15	Single-family Residence	152 W
16	Single-family Residence	172 W
17	Single-family Residence	263 W
18	Hanson & Calson's Carpets, Inc.	215 S
20	Exxon Building	288 W
21	Exxon Gas Station	272 W
26	Reflections Taxidermy	290 W
27	for rent	283 W
28	Kerri's Closet	283 W
29	Dancing Glass Boutique and Bistro	292 W
30	Single-family Residence	235 W
31	Fix it Shop	227 W
32	Eclectic..??	131 W
33	Single-family Residence	123 W
62	Warehouse	180 SW
63	Warehouse	49 SW
64	Warehouse	202 SW
65	Warehouse	179 SW
66	Warehouse	267 SW
67	Single-family Residence	279 N
68	Single-family Residence	274 N
69	Single-family Residence	263 N
70	Single-family Residence	260 N
71	Single-family Residence	253 N
72	Single-family Residence	255 N
73	Single-family Residence	265 N
74	Single-family Residence	267 N
75	Single-family Residence	262 N
76	Single-family Residence	256 N
77	Single-family Residence	244 N

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
78	Single-family Residence	179 S
79	Single-family Residence	195 S
80	Single-family Residence	216 S
81	Single-family Residence	203 S
82	Single-family Residence	203 S
83	Single-family Residence	215 S
84	Single-family Residence	211 S
85	Single-family Residence	214 S
86	Bulverde Airpark	5,382 W
88	T Mobile West Corp	1,166 W
92	SBC Tower Holdings, LLC	1,984 W
93	Crown Communication, LLC	792 S
94	KFLZ-LP-TV	1,473 S
95	KSSJ-LP TV	1,527 S
96	Access point to Cibolo Canyon (conservation easement)	0
97	Unknown heliport	3,833 S

[1]These structures and/or features are located on Figure 7-1 (map pocket).

TABLE 7-12

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES IN THE VICINITY OF ROUTE A6
BULVERDE SUBSTATION AND TRANSMISSION PROJECT

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
14	Single-family Residence	110 E
15	Single-family Residence	152 W
16	Single-family Residence	172 W
17	Single-family Residence	263 W
18	Hanson & Calson's Carpets, Inc.	215 S
20	Exxon Building	288 W
21	Exxon Gas Station	272 W
26	Reflections Taxidermy	290 W
27	for rent	283 W
28	Kerri's Closet	283 W
29	Dancing Glass Boutique and Bistro	292 W
30	Single-family Residence	235 W
31	Fix it Shop	227 W
32	Eclectic..??	131 W
33	Single-family Residence	123 W
56	Single-family Residence	91 S
57	Single-family Residence	106 S
58	Single-family Residence	142 S
59	Single-family Residence	224 S
60	Single-family Residence	246 SW
61	Single-family Residence	269 SW
86	Bulverde Airpark	5,382 W
88	T Mobile West Corp	1,166 W
92	SBC Tower Holdings, LLC	1,984 W
93	Crown Communication, LLC	1,235 S
96	Access point to Cibolo Canyon (conservation easement)	0
97	Unknown heliport	4,840 S

[1]These structures and/or features are located on Figure 7-1 (map pocket).

TABLE 7-13

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES IN THE VICINITY OF ROUTE A7
BULVERDE SUBSTATION AND TRANSMISSION PROJECT

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
36	Single-family Residence	160 NW
37	Single-family Residence	254 SE
38	Single-family Residence	205 SE
39	Single-family Residence	186 NW
40	Single-family Residence	190 NW
41	Single-family Residence	115 NW
42	Single-family Residence	248 SE
43	Allure Dude Ranch	271 NW
44	Single-family Residence	279 SE
45	Single-family Residence	242 NW
46	Single-family Residence	288 NW
47	Single-family Residence	267 SE
48	Mobile Home	252 SE
49	Single-family Residence	296 SE
50	Single-family Residence	241 NW
51	Single-family Residence	179 SE
52	Single-family Residence	297 SE
53	Single-family Residence	243 SE
54	Single-family Residence	244 E
55	Single-family Residence	164 E
86	Bulverde Airpark	6,370 W
88	T Mobile West Corp	1,166 W
96	Access point to Cibolo Canyon (conservation easement)	0
97	Unknown heliport	4,840 S

[1]These structures and/or features are located on Figure 7-1 (map pocket).

TABLE 7-14

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES IN THE VICINITY OF ROUTE A8
BULVERDE SUBSTATION AND TRANSMISSION PROJECT

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
1	Single-family Residence	294 NW
2	Security State Bank and Trust	149 NE
3	Chevron Gas Station	109 S
4	Commercial Center	160 S
5	Single-family Residence	182 S
6	St. Paul Lutheran Church	216 E
7	St. Paul Lutheran Day School	254 E
8	St. Paul Lutheran Office	61 E
10	Single-family Residence	202 E
15	Single-family Residence	152 W
16	Single-family Residence	172 W
17	Single-family Residence	263 W
18	Hanson & Calson's Carpets, Inc.	214 S
19	Unknown commercial	114 E
22	Single-family Residence	232 NE
23	Ferrell Gas	199 NE
24	Rebecca Creek Distillery	118 SW
25	Boatner and Hamad Land & Title	215 SW
29	Dancing Glass Boutique and Bistro	295 W
30	Single-family Residence	271 NW
31	Fix it Shop	228 W
32	Eclectic..??	167 NW
33	Single-family Residence	136 NW
34	Walgreens	287 S
56	Single-family Residence	91 S
57	Single-family Residence	106 S
58	Single-family Residence	142 S
59	Single-family Residence	224 S
60	Single-family Residence	246 SW
61	Single-family Residence	269 SW
86	Bulverde Airpark	2,930 W

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
88	T Mobile West Corp	1,156 E
92	SBC Tower Holdings, LLC	1,984 W
93	Crown Communication, LLC	849 S
96	Access point to Cibolo Canyon (conservation easement)	0
97	Unknown heliport	4,551 S

[1]These structures and/or features are located on Figure 7-1 (map pocket).

TABLE 7-15

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES IN THE VICINITY OF ROUTE A9
BULVERDE SUBSTATION AND TRANSMISSION PROJECT

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
14	Single-family Residence	110 E
15	Single-family Residence	152 W
16	Single-family Residence	172 W
17	Single-family Residence	263 W
18	Hanson & Calson's Carpets, Inc.	214 S
19	Unknown commercial	114 E
22	Single-family Residence	232 NE
23	Ferrell Gas	199 NE
24	Rebecca Creek Distillery	118 SW
25	Boatner and Hamad Land & Title	215 SW
29	Dancing Glass Boutique and Bistro	295 W
30	Single-family Residence	271 NW
31	Fix it Shop	228 W
32	Eclectic..??	167 NW
33	Single-family Residence	136 NW
34	Walgreens	287 S
56	Single-family Residence	91 S
57	Single-family Residence	106 S
58	Single-family Residence	142 S
59	Single-family Residence	224 S
60	Single-family Residence	246 SW
61	Single-family Residence	269 SW
86	Bulverde Airpark	5,382 W
88	T Mobile West Corp	1,166 W
92	SBC Tower Holdings, LLC	1,984 W
93	Crown Communication, LLC	849 S
96	Access point to Cibolo Canyon (conservation easement)	0
97	Unknown heliport	4,551 S

[1]These structures and/or features are located on Figure 7-1 (map pocket).

TABLE 7-16

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES IN THE VICINITY OF ROUTE B2
BULVERDE SUBSTATION AND TRANSMISSION PROJECT

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
9a	U-Haul Office	86 N
9b	JP Motor Center "Quality Used Cars"	87 S
10	Single-family Residence	202 E
15	Single-family Residence	152 W
16	Single-family Residence	172 W
17	Single-family Residence	263 W
18	Hanson & Calson's Carpets, Inc.	215 S
20	Exxon Building	288 W
21	Exxon Gas Station	272 W
26	Reflections Taxidermy	290 W
27	for rent	283 W
28	Kerri's Closet	283 W
29	Dancing Glass Boutique and Bistro	292 W
30	Single-family Residence	235 W
31	Fix it Shop	227 W
32	Eclectic..??	131 W
33	Single-family Residence	123 W
62	Warehouse	180 SW
63	Warehouse	49 SW
64	Warehouse	202 SW
65	Warehouse	179 SW
66	Warehouse	267 SW
67	Single-family Residence	279 N
68	Single-family Residence	274 N
69	Single-family Residence	263 N
70	Single-family Residence	260 N
71	Single-family Residence	253 N
72	Single-family Residence	255 N
73	Single-family Residence	265 N
74	Single-family Residence	267 N
75	Single-family Residence	262 N

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
76	Single-family Residence	256 N
77	Single-family Residence	244 N
78	Single-family Residence	179 S
79	Single-family Residence	195 S
80	Single-family Residence	216 S
81	Single-family Residence	203 S
82	Single-family Residence	203 S
83	Single-family Residence	215 S
84	Single-family Residence	211 S
85	Single-family Residence	214 S
86	Bulverde Airpark	2,930 W
92	SBC Tower Holdings, LLC	1,984 W
93	Crown Communication, LLC	792 S
94	KFLZ-LP-TV	1,473 S
95	KSSJ-LP TV	1,527 S
96	Access point to Cibolo Canyon (conservation easement)	0
97	Unknown heliport	3,833 S

[1]These structures and/or features are located on Figure 7-1 (map pocket).

TABLE 7-17

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES IN THE VICINITY OF ROUTE B3
BULVERDE SUBSTATION AND TRANSMISSION PROJECT

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
9a	U-Haul Office	86 N
9b	JP Motor Center "Quality Used Cars"	87 S
10	Single-family Residence	202 E
15	Single-family Residence	152 W
16	Single-family Residence	172 W
17	Single-family Residence	263 W
18	Hanson & Calson's Carpets, Inc.	215 S
20	Exxon Building	288 W
21	Exxon Gas Station	272 W
26	Reflections Taxidermy	290 W
27	for rent	283 W
28	Kerri's Closet	283 W
29	Dancing Glass Boutique and Bistro	292 W
30	Single-family Residence	235 W
31	Fix it Shop	227 W
32	Eclectic..??	131 W
33	Single-family Residence	123 W
56	Single-family Residence	91 S
57	Single-family Residence	106 S
58	Single-family Residence	142 S
59	Single-family Residence	224 S
60	Single-family Residence	246 SW
61	Single-family Residence	269 SW
86	Bulverde Airpark	2,930 W
92	SBC Tower Holdings, LLC	1,984 W
93	Crown Communication, LLC	1,235 S
96	Access point to Cibolo Canyon (conservation easement)	0
97	Unknown heliport	4,840 S

[1]These structures and/or features are located on Figure 7-1 (map pocket).

TABLE 7-18

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES IN THE VICINITY OF ROUTE B4
BULVERDE SUBSTATION AND TRANSMISSION PROJECT

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
11	Mobile Home	83 W
12	Auto Care Plus	243 W
13	Valero Gas Station	256 W
15	Single-family Residence	152 W
16	Single-family Residence	172 W
17	Single-family Residence	263 W
18	Hanson & Calson's Carpets, Inc.	214 S
19	Unknown commercial	114 E
22	Single-family Residence	232 NE
23	Ferrell Gas	199 NE
24	Rebecca Creek Distillery	118 SW
25	Boatner and Hamad Land & Title	215 SW
34	Walgreens	287 S
62	Warehouse	180 SW
63	Warehouse	49 SW
64	Warehouse	202 SW
65	Warehouse	179 SW
66	Warehouse	267 SW
67	Single-family Residence	279 N
68	Single-family Residence	274 N
69	Single-family Residence	263 N
70	Single-family Residence	260 N
71	Single-family Residence	253 N
72	Single-family Residence	255 N
73	Single-family Residence	265 N
74	Single-family Residence	267 N
75	Single-family Residence	262 N
76	Single-family Residence	256 N
77	Single-family Residence	244 N
78	Single-family Residence	179 S
79	Single-family Residence	195 S

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
80	Single-family Residence	216 S
81	Single-family Residence	203 S
82	Single-family Residence	203 S
83	Single-family Residence	215 S
84	Single-family Residence	211 S
85	Single-family Residence	214 S
86	Bulverde Airpark	4,211 W
92	SBC Tower Holdings, LLC	1,984 W
93	Crown Communication, LLC	792 S
94	KFLZ-LP-TV	1,473 S
95	KSSJ-LP TV	1,527 S
96	Access point to Cibolo Canyon (conservation easement)	0
97	Unknown heliport	3,833 S

[1]These structures and/or features are located on Figure 7-1 (map pocket).

TABLE 7-19

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES IN THE VICINITY OF ROUTE B5
BULVERDE SUBSTATION AND TRANSMISSION PROJECT

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
11	Mobile Home	83 W
12	Auto Care Plus	243 W
13	Valero Gas Station	256 W
15	Single-family Residence	152 W
16	Single-family Residence	172 W
17	Single-family Residence	263 W
18	Hanson & Calson's Carpets, Inc.	215 S
20	Exxon Building	288 W
21	Exxon Gas Station	272 W
26	Reflections Taxidermy	290 W
27	for rent	283 W
28	Kerri's Closet	283 W
29	Dancing Glass Boutique and Bistro	292 W
30	Single-family Residence	235 W
31	Fix it Shop	227 W
32	Eclectic..??	131 W
33	Single-family Residence	123 W
62	Warehouse	180 SW
63	Warehouse	49 SW
64	Warehouse	202 SW
65	Warehouse	179 SW
66	Warehouse	267 SW
67	Single-family Residence	279 N
68	Single-family Residence	274 N
69	Single-family Residence	263 N
70	Single-family Residence	260 N
71	Single-family Residence	253 N
72	Single-family Residence	255 N
73	Single-family Residence	265 N
74	Single-family Residence	267 N
75	Single-family Residence	262 N

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
76	Single-family Residence	256 N
77	Single-family Residence	244 N
78	Single-family Residence	179 S
79	Single-family Residence	195 S
80	Single-family Residence	216 S
81	Single-family Residence	203 S
82	Single-family Residence	203 S
83	Single-family Residence	215 S
84	Single-family Residence	211 S
85	Single-family Residence	214 S
86	Bulverde Airpark	4,211 W
92	SBC Tower Holdings, LLC	1,984 W
93	Crown Communication, LLC	792 S
94	KFLZ-LP-TV	1,473 S
95	KSSJ-LP TV	1,527 S
96	Access point to Cibolo Canyon (conservation easement)	0
97	Unknown heliport	3,833 S

[1]These structures and/or features are located on Figure 7-1 (map pocket).

TABLE 7-20

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES IN THE VICINITY OF ROUTE B6
BULVERDE SUBSTATION AND TRANSMISSION PROJECT

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
11	Mobile Home	83 W
12	Auto Care Plus	243 W
13	Valero Gas Station	256 W
15	Single-family Residence	152 W
16	Single-family Residence	172 W
17	Single-family Residence	263 W
18	Hanson & Calson's Carpets, Inc.	215 S
20	Exxon Building	288 W
21	Exxon Gas Station	272 W
26	Reflections Taxidermy	290 W
27	For rent	283 W
28	Kerri's Closet	283 W
29	Dancing Glass Boutique and Bistro	292 W
30	Single-family Residence	235 W
31	Fix it Shop	227 W
32	Eclectic..??	131 W
33	Single-family Residence	123 W
56	Single-family Residence	91 S
57	Single-family Residence	106 S
58	Single-family Residence	142 S
59	Single-family Residence	224 S
60	Single-family Residence	246 SW
61	Single-family Residence	269 SW
86	Bulverde Airpark	4,211 W
92	SBC Tower Holdings, LLC	1,984 W
93	Crown Communication, LLC	1,235 S
96	Access point to Cibolo Canyon (conservation easement)	0
97	Unknown heliport	4,840 S

[1]These structures and/or features are located on Figure 7-1 (map pocket).

TABLE 7-21

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES IN THE VICINITY OF ROUTE B7
BULVERDE SUBSTATION AND TRANSMISSION PROJECT

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
9a	U-Haul Office	86 N
9b	JP Motor Center "Quality Used Cars"	87 S
10	Single-family Residence	202 E
15	Single-family Residence	152 W
16	Single-family Residence	172 W
17	Single-family Residence	263 W
18	Hanson & Calson's Carpets, Inc.	214 S
19	Unknown commercial	114 E
22	Single-family Residence	232 NE
23	Ferrell Gas	199 NE
24	Rebecca Creek Distillery	118 SW
25	Boatner and Hamad Land & Title	215 SW
29	Dancing Glass Boutique and Bistro	295 W
30	Single-family Residence	271 NW
31	Fix it Shop	228 W
32	Eclectic..??	167 NW
33	Single-family Residence	136 NW
34	Walgreens	287 S
56	Single-family Residence	91 S
57	Single-family Residence	106 S
58	Single-family Residence	142 S
59	Single-family Residence	224 S
60	Single-family Residence	246 SW
61	Single-family Residence	269 SW
86	Bulverde Airpark	2,930 W
92	SBC Tower Holdings, LLC	1,984 W
93	Crown Communication, LLC	849 S
96	Access point to Cibolo Canyon (conservation easement)	0
97	Unknown heliport	4,551 S

[1]These structures and/or features are located on Figure 7-1 (map pocket).

TABLE 7-22

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES IN THE VICINITY OF ROUTE B8
BULVERDE SUBSTATION AND TRANSMISSION PROJECT

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
11	Mobile Home	83 W
12	Auto Care Plus	243 W
13	Valero Gas Station	256 W
15	Single-family Residence	152 W
16	Single-family Residence	172 W
17	Single-family Residence	263 W
18	Hanson & Calson's Carpets, Inc.	214 S
19	Unknown commercial	114 E
22	Single-family Residence	232 NE
23	Ferrell Gas	199 NE
24	Rebecca Creek Distillery	118 SW
25	Boatner and Hamad Land & Title	215 SW
29	Dancing Glass Boutique and Bistro	295 W
30	Single-family Residence	271 NW
31	Fix it Shop	228 W
32	Eclectic..??	167 NW
33	Single-family Residence	136 NW
34	Walgreens	287 S
56	Single-family Residence	91 S
57	Single-family Residence	106 S
58	Single-family Residence	142 S
59	Single-family Residence	224 S
60	Single-family Residence	246 SW
61	Single-family Residence	269 SW
86	Bulverde Airpark	4,211 W
92	SBC Tower Holdings, LLC	1,984 W
93	Crown Communication, LLC	849 S
96	Access point to Cibolo Canyon (conservation easement)	0
97	Unknown heliport	4,551 S

[1]These structures and/or features are located on Figure 7-1 (map pocket).

TABLE 7-23

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES IN THE VICINITY OF ROUTE C1
BULVERDE SUBSTATION AND TRANSMISSION PROJECT

Map No.[1]	Structure or Feature	Approximate Distance and Direction from Centerline (in ft)
35	Fry Roofing	180 SE
36	Single-family Residence	160 NW
37	Single-family Residence	254 SE
38	Single-family Residence	205 SE
39	Single-family Residence	186 NW
40	Single-family Residence	190 NW
41	Single-family Residence	115 NW
42	Single-family Residence	248 SE
43	Allure Dude Ranch	271 NW
44	Single-family Residence	279 SE
45	Single-family Residence	242 NW
46	Single-family Residence	288 NW
47	Single-family Residence	267 SE
48	Mobile Home	252 SE
49	Single-family Residence	296 SE
50	Single-family Residence	241 NW
51	Single-family Residence	179 SE
52	Single-family Residence	297 SE
53	Single-family Residence	243 SE
54	Single-family Residence	244 E
55	Single-family Residence	164 E
87	Flying J Airport	6,100 E
89	Unknown tower	1,946 W
90	Unknown tower	1,488 W
91	Unknown tower	1,233 W
96	Access point to Cibolo Canyon (conservation easement)	0
97	Unknown heliport	4,840 S

[1]These structures and/or features are located on Figure 7-1 (map pocket).

8.0 REFERENCES

Ahr, S.W., and D. Duke. 2002. Archeological Investigations for the San Antonio Water System Western Watershed Relief W-Extension-A Sewer Pipeline, San Antonio, Texas. Report of Investigations No. 251. Antiquities Permit No. 2805. Geo-Marine, Inc., San Antonio.

AirNav. 2013. Airport Search. http://www.airnav.com/airports/search.html.

Alamo Area Council of Governments (AACOG). 2013. http://www.aacog.com/.

Alexander, H.L., Jr. 1963. The Levi Site: A Paleo-Indian Campsite in Central Texas. In American Antiquity 28(4):510–528.

American Ornithologists' Union (AOU). 1998. Check-list of North American birds. 7th edition. Allen Press, Inc., Lawrence, Kansas.

———. 2000. 42nd supplement to the check-list of North American birds. Auk 117:847–858.

———. 2002. 43rd supplement to the check-list of North American birds. Auk 119:897–906.

———. 2003. 44th supplement to the check-list of North American birds. Auk 120:923–931.

———. 2004. 45th supplement to the check-list of North American birds. Auk 121:985–995.

———. 2005. 46th supplement to the check-list of North American birds. Auk 122:1026–1031.

———. 2006. 47th supplement to the check-list of North American birds. Auk 123:926–936.

———. 2007. 48th supplement to the check-list of North American birds. Auk 124:1109–1115.

———. 2008. 49th supplement to the check-list of North American birds. Auk 125.

———. 2009. 50th supplement to the check-list of North American birds. Auk 126:705–714.

———. 2010. 51st supplement to the check-list of North American birds. Auk 127(3):726–744.

———. 2011. 52nd supplement to the check-list of North American birds. Auk 128(3):600–613.

———. 2012. 53rd supplement to the check-list of North American birds. Auk 129(3):573–588.

———. 2013. 54th supplement to the check-list of North American birds. Auk 130(3):558–571.

Anonymous. 2012. *Handbook of Texas Online*, s.v. "Old San Antonio Road," http://www.tshaonline.org/handbook/online/articles/exo04.

Arnn III, J.W. 1997a. Archeological Investigations at the Landa Park Golf Course, New Braunfels, Texas. Report No. 250. Antiquities Permit No. 1682. Center for Archaeological Research, San Antonio.

———. 1997b. Archeological Investigations at the Landa Park Golf Course Pro Shop, New Braunfels, Texas. Report No. 256. Antiquities Permit No. 1757. Center for Archaeological Research, San Antonio.

Avery, M.L. (editor). 1978. Impacts of Transmission Lines on Birds in Flight: Proceedings of a Workshop. Oak Ridge Associated Universities. Oak Ridge, Tennessee. Inter-agency Agreement No. 40-570-76 between U.S. Department of the Interior and U.S. Department of Energy. FWS/OBS-78/48. 151 pp.

Avian Power Line Interaction Committee (APLIC). 1994. Mitigating bird collisions with power lines: the state of the art in 1994. Edison Electric Institute, Washington, D.C. 77 pp. + apps.

———. 1996. Suggested practices for raptor protection on power lines. The state-of-the-art in 1996. Edison Electric Institute (EEI)/Raptor Research Foundation, Washington, D.C. 125 pp. + apps.

———. 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. PIER Final Project Report CEC-500-2006-022. Washington, D.C. and Sacramento, California.

Bailey, G.L. 1986. Archeological Investigations in Landa Park, City of New Braunfels, Comal County, Texas. Letter Report No. 330. Antiquities Permit No. 544. Prewitt & Associates, Inc., Austin.

Bartlett, R.D., and P.P. Bartlett. 1999. A field guide to Texas reptiles and amphibians. Gulf Publishing Company, Houston.

Beaulaurier, D.L. 1981. Mitigation of bird collisions with transmission lines. Bonneville Power Administration, Portland, Oregon.

Black, S.L. 1989. South Texas Plains. In From the Gulf to the Rio Grande: Human adaptation in central, south, and Lower Pecos Texas, by T.R. Hester, S.L. Black, D.G. Steele, B.W. Olive, A.A. Fox, K.J. Reinhard, and L.C. Bement, pp. 38-62. Center for Archaeological Research, The University of Texas at San Antonio and the Arkansas Archeological Survey, Fayetteville.

Black, S.L., and A.J. McGraw. 1985. The Panther Springs Creek Site: Cultural Change and Continuity in the Upper Salado Creek Drainage, South-Central Texas. Center for Archaeological Research, The University of Texas at San Antonio, Archaeological Survey Report 100.

Blair, W.F. 1950. The biotic provinces of Texas. Texas Journal of Science 2:93–117.

Bureau of Economic Geology (BEG). 1983. Geologic atlas of Texas, San Antonio Sheet. The University of Texas at Austin. Revised in 1983 from 1974 version.

———. 1996. Physiographic map of Texas. Bureau of Economic Geology, The University of Texas at Austin.

———. 1997. Tectonic map of Texas. Bureau of Economic Geology, The University of Texas at Austin.

Bureau of Labor Statistics (BLS). 2013. Local Area Unemployment Statistics. http://www.bls.gov/data/.

Campbell, L. 1995. Endangered and threatened animals of Texas: their life history and management. Texas Parks and Wildlife Department, Endangered Resource Branch, Austin.

Campbell, T.N. 1962. Archeological investigation at the Morhiss Site, Victoria County, Texas, 1932–1940. Paper presented at the Texas Archeological Society meeting, Victoria, November 3, 1962.

Canadian Wildlife Service (CWS) and U.S. Fish and Wildlife Service. 2007. International recovery plan for the whooping crane. Recovery of National Endangered Wildlife (RENEW), Ottawa, and U.S. Fish and Wildlife Service, Albuquerque, New Mexico. 162 pp.

Chavez, M., and K. Miller. 2008. Archaeological Survey of the 15-mile FM 1836 Improvement Project, Bexar and Comal Counties, Texas. Report No. 05-143. Antiquities Permit No. 3716. SWCA Environmental Consultants, Austin.

———. 2010. Archaeological Survey of the Proposed 21.3-mile U.S. 281 Expansion Project, Evans Road to FM 306, Bexar and Comal Counties, Texas. Report No. 05-394. Antiquities Permit No. 3471. SWCA Environmental Consultants, Austin.

Chippindale, P.T., A.H. Price, J.J. Wiens, and D.M. Hillis. 2000. Phylogenetic relationships and systematic revision of central Texas hemidactyliine plethodontid salamanders. Herpetological Monographs, 14 (2000):1–80.

Clark, P. 2011. An Intensive Cultural Resources Survey of Bulverde Road Phase IV from Marshall Road North for Approximately 1.19 miles (6,300 feet), Bexar County, Texas. Antiquities Permit No. 5808. Raba-Kistner Consultants, Inc., San Antonio.

Cliff, M.B., M.E. Brown, D.E. Peter, and S.N. Allday. 1990. Cultural Resources Survey along Salado Creek, Bexar County, Texas. Miscellaneous Report of Investigations, Number 17.

Collins, M. 1969. Excavations at Amistad Reservoir. Texas Archeological Salvage Project, The University of Texas at Austin, Papers 16.

Collins, M.B. 1993. 1992 Excavations at the Wilson-Leonard Site in Cultural Resource Management News & Views, Vol. 5, No. 1. Texas Historical Commission, Austin.

Collins, M.B., G.L. Evans, and T.N. Campbell. 1988. Paleoindian components at Kincaid Rockshelter, Uvalde County, Texas. Paper presented at the 59th Annual meeting of the Texas Archeological Society, Houston, Texas. Manuscripts on file at the Office of the State Archeologist, Texas Historical Commission, Austin.

Crother, B.I. (editor). 2008. Scientific and standard English names of amphibians and reptiles of North America north of Mexico. Society for the Study of Amphibians and Reptiles, Herpetological Circular No. 37. January 2008. 84 pp.

Dase, A.E., S. Chandler, S. Katauskas, and C. Finney. 2010. "Historic Farms and Ranches of Bexar County, Texas." National Register of Historic Places Multiple Property Documentation Form. Prewitt and Associates, Inc., Austin.

Dibble, D.S., and D. Lorrain. 1968. Bonfire Shelter: A stratified bison kill site, Val Verde County, Texas. Miscellaneous Papers No. 1, Texas Memorial Museum. The University of Texas at Austin.

Dixon, J.R. 2000. Amphibians and reptiles of Texas. Texas A&M University Press, College Station. 421 pp.

Dockall, J.E, D.K. Boyd, and L.E. Kittrell. 2006. Geoarcheological and Historical Investigations in the Comal Springs Area, LCRA Clear Springs Autotransformer Project, Comal County, Texas. Investigation No. 149. Antiquities Permit No. 3850. Prewitt & Associates, Inc., Austin.

Electric Power Research Institute. 1993. Proceedings: Avian Interactions with Utility Structures. International Workshop, Miami, Florida, September 13–16, 1992. EPRI TR-103268, Palo Alto, California.

Ellis, L.W., K.M. McDonald, and M.A. Nash. 2009. Report of Surveys and Impact Evaluations Conducted in TXDOT's Corpus Christi, Laredo, Pharr, and San Antonio Districts during 2006-2008 under Contract No. 576XXSA007. Texas Antiquities Permit No. 4240. PBS&J, Austin.

Erickson, W.P., G.D. Johnson, and D.P. Young, Jr. 2005. A summary and comparison of bird mortality from anthropogenic causes with an emphasis on collisions. USDA Forest Service Gen. Tech. Rep. PSW-GET-191: 1029-1042. Western Ecosystems Technology, Inc., Cheyenne, Wyoming.

Faaborg, J., M. Brittingham, T. Donovan, and J. Blake. 1992. Habitat fragmentation in the temperate zone: a perspective for managers. In: D.M. Finch and P.W. Stangel (editors). Status and management of neotropical migratory birds. USDA Forest Service General Technical Report RM-229. Fort Collins, Colorado.

Faanes, C.A. 1987. Bird behavior and mortality in relation to power lines in prairie habitats. Fish and Wildlife Technical Report 7. U.S. Fish and Wildlife Service, Washington, D.C. 24 pp.

Federal Aviation Administration, U.S. Department of Transportation (FAA). 1975. Objects affecting navigable air space. Federal Aviation Regulations, Part 77. Washington, D.C.

————. 2012. National Aeronautical Charting Office. San Antonio Sectional Chart. http://skyvector.com/. Effective November 15, 2012.

————. 2013. Airport/Facility Directory. http://aeronav.faa.gov/afd.asp?cycle=afd_07MAR2013&eff=03-07-2013&end=05-02-2013. Effective March 7, 2013.

Federal Communications Commission (FCC). 2013. FCC Search Tools. AM/FM/TV station queries. http://www.fcc.gov/searchtools.html. Washington, D.C.

Federal Emergency Management Agency (FEMA). 2013. FEMA Mapping Information Platform, Map Viewer. https://hazards.fema.gov/wps/portal/mapviewer.

Feit, R., and M.C. Stotts. 2007. Archeological Survey of FM 1044 Improvements from IH 35 to Weil Road in Comal and Guadalupe Counties, Texas, CSJ 2021-01-009. Series No. 168. Antiquities Permit No. 4246. Hicks & Company, Austin.

Fish and Wildlife Service (FWS), U.S. Department of the Interior. 1995. Threatened and endangered species of Texas. U.S. Fish and Wildlife Service, Austin, Texas.

———. 2009. Whooping cranes and wind development – an issue paper. U.S. Fish and wildlife Service, regions 2 and 6. April 2009. 27 pp.

———. 2011. Endangered Species of the Mountain-Prairie Region – Sprague's Pipit. http://www.fws.gov/mountain-prairie/species/birds/spraguespipit/index.html

———. 2012a. Candidate Notice of Review for the bracted twistflower. *Federal Register* Volume 77, No. 225 (November 21, 2012).

———. 2012b. Draft Gulf Coast Jaguarundi (*Puma yagouaroundi cacomitli*) Recovery Plan, First Revision. U.S. Fish and Wildlife Service, Southwest Region, Albuquerque, New Mexico. 56 pp.

———. 2013a. Endangered species list: list of species by county for Texas. http://www.fws.gov/southwest/es/ES_Lists_Main.cfm

———. 2013b. Find Your Refuge. http://www.fws.gov/refuges/.

Garrett, J.M., and D.G. Barker. 1987. A field guide to reptiles and amphibians of Texas. Texas Monthly Press, Inc., Austin.

Gauthreaux, S.A., Jr. 1978. Migratory behavior and flight patterns. In: M.L. Avery (editor), Impacts of Transmission Lines on Birds in Flight – Proceedings of a Workshop. Pp. 12–26. U.S. Fish and Wildlife Service, Washington, D.C.

Gibbs, J., and M.R. Chavez. 2008. Cultural Resources Survey of the Proposed 17-Acre New Comal ISD Elementary School, Bexar County, Texas. Report No. 07-419. Antiquities Permit No. 4631. SWCA Environmental Consultants, Austin.

Greene, D.P. 2013 s.v. "Comal County," Handbook of Texas Online http://www.tshaonline.org/handbook/online/articles/hcc19.

Grzybowski, J. 1995. Black-capped vireo (*Vireo atricapillus*). In: The Birds of North America, No. 181 (A. Poole and F. Gill, editors). The Academy of Natural Sciences, Philadelphia, and the American Ornithologists' Union, Washington, D.C.

Haas, O. 2013a. Handbook of Texas Online, s.v. "Bulverde," http://www.tshaonline.org/handbook/online/articles/hnb99.

————. 2013b. Handbook of Texas Online, s.v. "Smithson Valley," http://www.tshaonline.org/handbook/online/articles/hns56.

Hagan, J.M., W.M. Vander Haegen, and P.S. McKinley. 1996. The Early Development of Forest Fragmentation Effects on Birds. Conservation Biology 10(1):188–202.

Hall, G., K. Grombacher, and D. Dibble. 1974. A Study of the Archeological and Historical Resources to be Affected by Proposed and Alternate Transmission Line Routes, South Texas Project. Research Report No. 39. Texas Archeological Survey, Austin.

Hartnett, C. 2009. Intensive Archaeological Resources Survey of a Proposed 22-Acre School Site, Comal County, Texas. Research Report No. 2008-526. Antiquities Permit No. 5080. SWCA Environmental Consultants, Austin.

Hatch, S.L., K.N. Gandhi, and L.E. Brown. 1990. Checklist of the vascular plants of Texas. MP-1655. Texas A&M University, Texas Agricultural Experiment Station, College Station. 158 pp.

Henderson, J. 1980. Update on excavations near the intersection of I-10 and FM 164. Paper presented to the Southern Texas Archaeological Association, January 19, 1980.

Henke, S.E., and W.S. Fair. 1998. Management of Texas horned lizards. Management Bulletin No. 2. Caesar Kleberg Wildlife Research Institute, Texas A&M University-Kingsville.

Herkert, J.R., D.L. Reinking, D.A. Wiedenfeld, M. Winter, J.L. Zimmerman, W.E. Jensen, E.J. Finck, R.R. Koford, D.W. Wolfe, S.K. Sherrod, M.A. Jenkins, J. Faaborg, and S. K. Robinson. 2003. Effects of Prairie Fragmentation on the Nest Success of Breeding Birds in the Midcontinental United States. Cons. Bio. 17(2):587–594.

Hester, T.R. 1975. Archaeological and Historical Resources in the San Antonio - Guadalupe River Basins: A Preliminary Statement. Regional Studies No. 1. Center for Archeological Research, San Antonio.

————. 1978. Early human occupation in south central and southwestern Texas: Preliminary papers on the Baker Cave and St. Mary's Hall sites. Center for Archaeological Research, San Antonio.

Hester, T.R., F. Bass, Jr., and T. Kelly. 1975. Archaeological Survey of Portions of The Comal River Watershed, Comal County, Texas. Report No. 6. Center for Archeological Research, San Antonio.

Houk, B.A., K. Lawrence, and K.S. Barile. 2005. A Cultural Resources Survey of the GBRA Western Canyon Pipeline, Bexar, Comal and Kendall Counties, Texas. Report No. 03-417. Antiquities Permit No. 2747. SWCA Environmental Consultants, Austin.

Howells, R.G. 2010. Freshwater mussels of Live Oak Creek, Gillespie County, Texas. Bio Studies – Kerrville, Texas. Prepared for Settler's Ridge Homeowners, Fredericksburg, Texas, and Kemp Smith, LLP, Austin, Texas. January 2010. 18 pp.

Howells, R.G., R.W. Neck, and H.D. Murray. 1996. Freshwater Mussels of Texas. Texas Parks and Wildlife Press, Austin. 218 pp.

Hoyt, S.D. 1993. Archaeological Construction Monitoring Landa Park Golf Course Modifications, Site 41CM190, New Braunfels, Comal County, Texas. Antiquities Permit No. 1315. EH&A, Inc., Austin.

Hubbs, C., R.J. Edwards, and G.P. Garrett. 2008. An annotated checklist of the freshwater fishes of Texas, with keys to identification of species. 2nd Edition. Texas Journal of Science 43(4):1–87. Also available from http://www.texasacademyofscience.org/.

Jackson, A.T. 1938. The Fall Creek sites. Annual report of the WPA and the University of Texas Archeological Research, Lake Buchanan 1936–1937. The University of Texas at Austin publications III (1).

Jelks, E.B. 1962. The Kyle Site, a stratified Central Texas Aspect Site in Hill County, Texas. Department of Anthropology, the University of Texas at Austin, Archaeology Series 5.

Johnson, L. Jr., 1964. The Devil's Mouth Site, a stratified campsite at Amistad Reservoir, Val Verde County, Texas. Department of Anthropology, The University of Texas at Austin, Archaeology Series 6:1–115.

————. 1994. The Life and Times of Toyah-Culture Folk: The Buckhollow Encampment Site, 41KM16, Kimble County, Texas. Office of the State Archeologist Report No. 38. Texas Department of Transportation and Texas Historical Commission, Austin.

Johnson, L., Jr., D.A. Suhm, and C.D. Tunnell. 1962. Salvage archeology of Canyon Reservoir: The Wunderlich, Footbridge, and Oblate sites. Bulletin No. 5. Texas Memorial Museum, Austin.

Kasner, A.C., and R.D. Slack. 2002. Use of reclaimed mine land by disturbance-oriented avian species: implications for conservation and management. Proceedings of the 19th Annual Meeting of the American Society of Mining and Reclamation, Cheyenne, Wyoming.

Katz, P.R. 1987. The Archaeology of 41BX300, Salado Creek Watershed, South Central Texas. Center for Archaeological Research, the University of Texas at San Antonio, Archaeological Survey Report 130.

Kelley, J.C. 1947. The Lehmann Rock Shelter: A stratified site of the Toyah, Uvalde, and Round Rock foci. Bulletin of the Texas Archeological and Paleontological Society 18:115–128.

————. 1959. The Desert cultures and the Balcones Phase: Archaic manifestations in the Southwest and Texas. American Antiquity 24:76–288.

Ladd, C., and L. Gass. 1999. Golden-cheeked Warbler (*Dendroica chrysoparia*). In: The Birds of North America, No. 420 (A. Poole and F. Gill, editors). The Birds of North America, Inc., Philadelphia, Pennsylvania.

Lewis, J.C. 1995. Whooping Crane (*Grus americana*). In: The Birds of North America, No. 153 (A. Poole and F. Gill, editors). The Academy of Natural Sciences, Philadelphia, and The American Ornithologists' Union, Washington, D.C.

Lockwood, M.W. 2001. Birds of the Texas Hill Country. University of Texas Press, Austin.

Lockwood, M.W., and B. Freeman. 2004. The Texas Ornithological Society Handbook of Texas Birds. Texas A&M University Press, College Station. 261 pp.

Long, C. 2013. Handbook of Texas Online, s.v. "Bexar County," http://www.tshaonline.org/handbook/online/articles/hcb07.

Lukowski, P. 1988. Archaeological Investigations at 41BX1, Bexar County, Texas. Archaeological Survey Report 135. Center for Archaeological Research, the University of Texas at San Antonio.

Malof, A. and D. Prikryl. 2012. Intensive Cultural Resources Survey of New Braunfels Utilities Proposed E. C. Mornhinweg Substation Project Comal County, Texas. Report No. 17. Antiquities Permit No. 6166. Lower Colorado River Authority, Austin.

Manning, R.W., C. Jones, and F.D. Yancey, II. 2008. Annotated checklist of recent land mammals of Texas, 2008. Museum of Texas Tech University, Lubbock. Occasional Papers, No. 278. 28 October 2008. 18 pp.

Marshall, J.T., R.B. Clapp, and J.A. Grzybowski. 1985. Status report: Vireo atricapillus Woodhouse, black-capped vireo. U.S. Fish and Wildlife Service, Albuquerque, New Mexico. 40 pp. and figs.

McGraw, A.J., and V.K. Hindes. 1986. El Rio Medino: La historia de los indios prehistoricas y los pobladores primeros. A Phase II Cultural Resources Assessment of the Proposed Applewhite Reservoir, Southwest Bexar County, Texas. Archaeological Survey Report 163. Center for Archaeological Research, The University of Texas at San Antonio.

McKinney, B. 2001. Black bear status. Performance Report, Federal Aid Grant No. W-125-R-12, Project No. 91. Texas Parks and Wildlife Department, Austin. October 17, 2001.

McNatt, L., C. Beceiro, M.D. Freeman, S.A. Tomka, P. Schuchert, and C.G. Ward. 2000. Archeological Survey and History of Government Canyon State Natural Area, Bexar County, Texas. Antiquities Permit No. 1669. Cultural Resources Program, Texas Parks and Wildlife, Austin.

Mercado-Allinger, P.A., N.A. Kenmotsu, and T.K. Perttula. 1996. Archeology in the central and southern planning region, Texas: A planning document. Department of Antiquities Protection, Cultural Resource Management Report 7, Texas Historical Commission, Austin.

Miller, M., J. Campbell, and R. Feit. 2007. Intensive Archeological Survey of the proposed expansion of State Highway 46 from East of Loop 337 in New Braunfels to Bulverde Road in Anhalt, Comal County, Texas. Archeological Series No. 166. Antiquities Permit No. 4200. Hicks and Company, Austin.

Mobiledia. 2013. Cell Phone Towers. http://www.cellreception.com/towers/.

Nash, M.A. 2003. A Cultural Resources Survey of Portions of the Proposed Fair Oaks Ranch Transmission and Distribution Line Project, Bexar, Comal, and Kendall Counties, Texas. Antiquities Permit No. 3026. PBS&J, Austin.

National Park Service (NPS). 2013. Find a park. http://www.nps.gov/findapark/index.htm.

Natural Resources Conservation Service (NRCS). 2000. Summary Report 1997 National Resources Inventory. U.S. Department of Agriculture, Washington, D.C. Revised December 2000.

———. 2013a. Web Soil Survey. Map area of interest with identified soil map units. http://websoilsurvey.nrcs.usda.gov/.

———. 2013b. Soil data Mart. Query for Prime Farmland Soils in Bexar County and Comal County. http://soildatamart.nrcs.usda.gov/.

Nature Conservancy, The. 2013. Texas, Places We Protect. http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/texas/placesweprotect/index.htm.

New York Power Authority. 2005. Estimates of Bird Mortality Associated with Transmission Lines. Niagara Power Project FERC No. 2216. 56 pp. http://niagara.nypa.gov/ALP%20working%20documents/finalreports/IS14.pdf

Nickels, D.L. 2011. Archaeological Investigations in Landa Park and Golf Course, City of New Braunfels, Comal County, Antiquities Permit No. 5454 and 5642. Texas. Ecological Communications Corporation, Austin.

Oberholser, H.C. 1974. The Bird Life of Texas. 2 vol. University of Texas Press, Austin. 1,069 pp.

Olendorff, R.R., A.D. Miller, and R.N. Lehman. 1981. Suggested practices for raptor protection on power lines. The state-of-the-art in 1981. Raptor Research Foundation, St. Paul. 111 pp.

Pearce, J. 1919. Indian mounds and other relics of Indian life in Texas. American Anthropologist 21(3):223–234.

———. 1932. The present status of Texas Archeology. Bulletin of the Texas Archeological and Paleontological Society 4:44–54.

Peyton, A. 2009. Intensive Cultural Resources Survey of a Proposed 18-Acre School Site, Comal County, Texas. Antiquities Permit No. 5113. SWCA Environmental Consultants, Austin.

Peyton, A. 2010. Cultural Resources Survey of the Comal Independent School District 68-Acre Development Tract, Comal County, Texas. Report No. 10-54. Antiquities Permit No. 5500. SWCA Environmental Consultants, Austin.

Pool, W.C. 1975. A Historical Atlas of Texas. Encino Press, Austin.

Poole, J.M., J. Singhurst, D. Hurlburt-Price, and W.R. Carr. 2000. A list of the rare plants of Texas. Texas. Texas Parks and Wildlife Department and the Nature Conservancy of Texas, Austin. January 2000 edition.

Prewitt, E.R. 1981. Cultural chronology in central Texas. Bulletin of the Texas Archeological Society 52:65–89.

Ray, C.N. 1929. A differentiation of the prehistoric cultures of the Abilene Section. Bulletin of the Texas Archeological and Paleontological Society, 1:7–22.

————. 1930. Report on some recent archeological researches in the Abilene Section. Bulletin of the Texas Archeological and Paleontological society 2:45–58.

————. 1934. Flint cultures of ancient man in Texas. Bulletin of the Texas Archeological and Paleontological Society 6:107–111.

Robbins, C.S., D. Dawson, and B. Dowell. 1989. Habitat area requirements of breeding forest birds of the Middle Atlantic states. Wildlife Monographs No. 103. The Wildlife Society, Blacksburg, Virginia.

Rochelle, J.A., L.A. Lehmann, and J. Wisniewski. 1999. Forest Fragmentation: Wildlife and Management Implications. 303+ pages.

Rogers, R., and M.K. Russell. 2007. Final Report A cultural resources survey of State Highway 130: Segments A, B, and C Caldwell, Guadalupe, Travis, and Williamson Counties, Texas. Texas Antiquities Permits Nos. 2691, 2692, and 2693. Document No. 060270. PBS&J, Austin.

Rusz, P.J., H.H. Prince, R.D. Rusz, and G.A. Dawson. 1986. Bird collisions with transmission lines near a power plant cooling pond. Wildlife Society Bulletin 14:441–444.

San Antonio Audubon Society (SAAS). 2004. Birds of Bexar County, Texas: a seasonal field checklist, 2004 edition. http://www.saaudubon.org/checklist.html.

Sayles, E.B. 1935. An archaeological survey of Texas. Medallion Papers XVIII: 1–164. Gila Pueblo, Globe, Arizona.

Schmidly, D.J. 2004. The Mammals of Texas. Texas Parks and Wildlife Department. University of Texas Press, Austin. 501 pp.

Shafer, H. 1963. Test excavations at the Youngsport Site: A stratified terrace site in Bell County, Texas. Bulletin of the Texas Archeological Society 34:57–81.

Skoglund, T. and K.D. French. 2002. A Cultural Resource Survey of the 88-Acre Comal Independent School District High School Project Area, Comal County, Texas. Resource Report No. 02-307. Antiquities Permit No. 2906. SWCA Environmental Consultants, Austin.

Smith, H.M., and F.E. Potter. 1946. A third neotonic salamander of the genus *Eurycea* from Texas. Herpetologica 3:105–109.

Smith, M.N., B. Dixon, and M. Nash. 2004. A Cultural Resources Survey of the Green Mountain-Stonegate Transmission Line, Bexar and Comal Counties, Texas. Antiquities Permit No. 3242. PBS&J, Austin.

Soil Conservation Service (SCS, now the Natural Resources Conservation Service [NRCS]). 1984. Soil survey of Comal and Hays Counties, Texas. In cooperation with Texas Agricultural Experiment Station.

———. 1991. Soil survey of Bexar County, Texas. In cooperation with Texas Agricultural Experiment Station.

Sorrow, W.M. 1968. The Devil's Mouth Sites, the third season. 1969 Papers of the Texas Archeological Salvage Project No. 14, The University of Texas at Austin.

Sorrow, W.M., H.J. Shafer, and R.E. Ross. 1967. Excavations at Stillhouse Hollow Reservoir. Papers of the Texas Archeological Salvage Project 11. Austin.

State Department of Highways and Public Transportation. 1976. Letter Report: FM 3009 From FM 2252 to FM 1863, Cultural Resources Assessment, Comal County. SDHPT. Austin.

Stephenson, R.L. 1947. Archeological survey of Whitney Basin: A preliminary report. Bulletin of the Texas Archeological Salvage Project 11.

Stevens Trucking, Inc. 2013. Personal communication via phone with H. Neblett, Atkins, 29 August 2013.

Stout, J., and G.W. Cornwell. 1976. Nonhunting mortality of fledged North American waterfowl. Journal of Wildlife Management 40(4):681–693.

Suhm, D.A., A.D. Krieger, and E.B. Jelks. 1954. An introductory handbook of Texas archeology, Bulletin of the Texas Archeological Society, Volume 25.

Taylor, R. 1995. A Cultural Resources Survey of the Schumansville Transmission Line Project, Comal and Guadalupe Counties, Texas. Antiquities Permit No. 1596. EH&A, Inc., Austin.

Taylor, R.B. 1990. Black bear status. Performance Report, Federal Aid Grant No. W-125-R-1, Project No. 68. Texas Parks and Wildlife Department, Austin. October 23, 1990.

———. 1993. Black bear status. Performance Report, Federal Aid Grant No. W-125-R-4, Project No. 68. Texas Parks and Wildlife Department, Austin. November 19, 1993.

———. 1994. Black bear status. Performance Report, Federal Aid Grant No. W-125-R-5, Project No. 68. Texas Parks and Wildlife Department, Austin. October 20, 1994.

———. 2000. Black bear status. Performance Report, Federal Aid Grant No. W-125-R-11, Project No. 91. Texas Parks and Wildlife Department, Austin. October 10, 2000.

Tennant, A. 1998. A Field Guide to Texas Snakes. Second Edition. Gulf Coast Publishing, Houston. 291 pp.

Tennis, C.L. 1996. Archaic land use of upper Leon Creek terraces: Archaeological testing in northern Bexar County, Texas. The Center for Archaeological Research, the University of Texas at San Antonio, Archaeological Survey Report No. 234.

Tennis, C.L., and R.J. Hard. 1995. Archaeological survey of upper Leon Creek terraces, Bexar County, Texas. Archaeological Survey Report No. 233. The Center for Archaeological Research, the University of Texas at San Antonio.

Terborgh, J. 1989. Where have all the birds gone?: essays in the biology and conservation of birds that migrate to the American tropics. Princeton University Press, Princeton, New Jersey. 207 pp.

Texas A&M University (TAMU). 2012. Real Estate Center, Texas Market Reports, Building Permit Activity. http://recenter.tamu.edu/mreports/.

Texas Commission on Environmental Quality (TCEQ). 2008. TCEQ review of the Water Pollution Abatement Plan (WPAP) for Hwy 281/Bulverde Road Quarry. 24 November 2008. http://www.cceo.org/environmental/documents/WPAP/Hwy_281_Bulverde_Road_Quarry.pdf.

Texas Department of Transportation (TxDOT). 1991. Cultural Resources Assessment, Comal and Guadalupe Counties IH 35: Highway Widening from FM 3009 to Loop 337. TXDOT, Austin.

————. 1998. Texas Highways Magazine: Volume 45, No. 8. Scenic Overlooks and Rest Areas. Austin, Texas. August 1998.

————. 2013a. Texas Highway Designation Files. http://www.dot.state.tx.us/tpp/search/query.htm.

————. 2013b. Texas Airport Directory. http://www.dot.state.tx.us/travel/airport_directory.htm.

Texas Education Agency. 2013. GIS Mapping – School District Locator. http://wgisprd.tea.state.tx.us/SDL/.

Texas Land Conservancy (TLC). 2013. Lands, Map. http://www.texaslandconservancy.org/.

Texas Parks and Wildlife Department (TPWD). 2009. 15 Texas Freshwater Mussels Placed on State Threatened List. News Release: November 5, 2009. http://prodweb.tpwd.state.tx.us/newsmedia/releases/?req=20091105c.

————. 2013a. Rare, Threatened, and Endangered Species of Texas by County. <http://www.tpwd.state.tx.us/landwater/land/maps/gis/ris/endangered_species/>. Last modified Nov. 2, 2012 Bexar and Comal counties.

————. 2013b. Texas Natural Diversity Database (NDD) information request for Bexar and Comal counties.

————. 2013c. Edwards Aquifer Species. http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_bk_w7000_0013_edwards_aquifer_species.pdf.

————.2013d. Find a park. http://www.tpwd.state.tx.us/state-parks/.

————. 2013e. Water Body Records for Cibolo Creek. http://www.tpwd.state.tx.us/fishboat/fish/action/waterecords.php?WB_code=1105.

Texas Speleological Society (TSS). 2013. TSS database statistics by county. http://www.utexas.edu/tmm/sponsored_sites/tss/longdeep/counties.html (accessed February 2013).

Texas Water Development Board (TWDB). 1995. Aquifers of Texas. Report 345, November 1995.

————. 2007. Water for Texas: 2007 State Water Plan. Chapter 6: Surface Water Resources and Chapter 7: Groundwater Resources. Texas Water Development Board, Austin.

————. 2011. Population Projections Data: Final TWDB Board-Approved Population Projections for the Year 2000 through 2060. http://www.twdb.state.tx.us/waterplanning/data/projections/index.asp.

————. 2012. Water for Texas: 2012 State Water Plan. Chapter 5: Water Supplies. Texas Water Development Board, Austin.

Texas Workforce Commission (TWC). 2013. Quarterly census of employment and wages, third quarter 2007 and 2012 data. http://www.tracer2.com/cgi/dataAnalysis/AreaSelection.asp?tableName=Industry.

Thompson, B.C., J.A. Jackson, J. Burger, L. Hill, E.M. Kirsch, and J.L. Atwood. 1997. Least tern (*Sterna antillarum*). In: The birds of North America, No. 290 (A. Poole and F. Gill, editors). The Academy of Natural Sciences and the American Ornithologist's Union, Philadelphia and Washington, D.C.

Thompson, L.S. 1978. Transmission line wire strikes: mitigation through engineering design and habitat modification. In: M.L. Avery (editor), Impacts of Transmission Lines on Birds in Flight: Proceedings of a Workshop. Pp. 27–52. Oak Ridge Associated Universities, Oak Ridge, Tennessee. Interagency Agreement No. 40-570–76.

Thoms, A.V., P.A. Claybaugh, S. Thomas, and M. Kamiya. 2005. Archaeological Survey and Monitoring in 2005 at the Richard Beene Site, South-Central Texas. Technical Report Series No. 7. Antiquities Permit No. 3836. Texas A&M University, College Station.

Uecker, H. 2006. A Cultural Resources Survey for the Borgfeld Drive Improvements Project, Bexar County, Texas. Report of Investigations No. 103. Antiquities Permit No. 4256. South Texas Archeological Research Services, LLC, Bulverde.

U.S. Census Bureau. 1983. United States Census 1980. General Social and Economic Characteristics. Washington, D.C.

————. 1990. United States Census 1990. American Factfinder. General Population and Housing Characteristics: 1990. http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml. Washington, D.C.

————. 2000. United States Census 2000. American Factfinder. Population, Housing Units, Area, and Density: 2000. http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

————. 2011. Population and Housing Occupancy Status, by County and by Place. http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC_10_PL_GCTPL2.ST05&prodType=table.

U.S. Department of Agriculture (USDA). 2007. The 2007 Census of Agriculture – State and County Profiles. National Agricultural Statistics Service. http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/County_Profiles/Texas/index.asp.

Weir, F.A. 1976. The central Texas Archaic. Ph.D. dissertation, Washington State University, University Microfilms, Ann Arbor.

Werler, J.E., and J. Dixon. 2000. Texas snakes, identification, distribution, and natural history. University of Texas Press, Austin. 437 pp.

Wilcox, D. 2006. Cultural Resources Survey of the Alamo Ranch Medio Creek Sewer Line, Bexar County, Texas. Cultural Resources Report No. 2006-521. Antiquities Permit No. 4252. SWCA Environmental Consultants, Austin.

Willard, D.E. 1978. The impact of transmission lines on birds (and vice versa). In: M.L. Avery (editor), Impacts of Transmission Lines on Birds in Flight – Proceedings of a Workshop. Pp. 3–7. U.S. Fish and Wildlife Service, Washington, D.C.

Willey, G.R. 1966. An Introduction to American Archaeology. Prentice Hall, Inc., New York.

Wurtz, C. B. 1950. *Quadrula* (*Quincuncina*) *guadalupensis* sp. Nov. (Unionidae: Pelecypoda). Notulae Naturae 224:1–3.

Young, B.S. 2002a. Archaeological Survey of a Proposed Expansion of US 281 at Stone Oak Parkway, San Antonio, Bexar County, Texas. Report No. 01-449. Antiquities Permit No. 2651. SWCA, Inc., Austin.

————. 2002b. Archaeological Survey of a Proposed Expansion of US 281 at Borgfeld Drive, Bexar County, Texas. Report No. 01-450. Antiquities Permit No. 2651. SWCA, Inc., Austin.

Appendix A

Agency Correspondence

ATKINS

Atkins North America, Inc.
6504 Bridge Point Parkway, Suite 200
Austin, Texas 78730

Telephone: +1.512.327.6840
Fax: +1.512.327.2453

www.atkinsglobal.com/northamerica

August 7, 2013

Project No. 100032882

Re: Proposed CPS Energy Bulverde Substation Project

Dear Official:

CPS Energy is planning to construct a new electric substation in the north central area of San Antonio near US 281 and FM 1863 in Comal County or Bexar County. The proposed Bulverde Substation will provide additional electric capacity to support community growth and to improve the reliability of electric services to homes and businesses in that area. The new substation will cover an area of approximately 3 to 5 acres and will be connected to CPS Energy's existing Stonegate to Green Mountain 138-kilovolt (kV) transmission line by a double-circuit transmission line. We would like your assistance in obtaining any information that would be useful in planning the project.

CPS Energy has tasked Atkins to prepare an Environmental Assessment and Alternative Site Analysis (EA). Atkins is in the process of collecting and evaluating environmental data for the study area. We ask that your agency/office relate to us any concerns regarding the siting and potential environmental effects from the construction of this electric substation. A map showing the study area is attached for your convenience.

Atkins would like to thank you in advance for comments from your office regarding the natural, cultural or human resources in the study area. Also, we would like to know if any permits, easements, or other approvals are required by your office, or if you are aware of any proposed development or construction in the study area.

Questions may be directed to me at (512) 342-3380. Your earliest reply will be appreciated.

Sincerely,

Derek Green
Senior Project Manager

Attachment

cc: Cathleen Ballard, CPS Energy
Michael Hellums, CPS Energy

FEDERAL/STATE/LOCAL AGENCIES CONTACTED BY ATKINS
BULVERDE SUBSTATION AND TRANSMISSION PROJECT

FEDERAL

Ms. Teri Bruner
Southwest Regional Administrator
Federal Aviation Administration
2601 Meacham Boulevard
Fort Worth, TX 76137-4298

Mr. Salvador Salinas
State Conservationist
NRCS Texas State Office
101 South Main Street
Temple, TX 76501

Mr. Ron Curry
Region 6 Administrator
U. S. Environmental Protection Agency
1445 Ross Avenue, Suite 1200
Dallas, TX 75202

Mr. Tony Robinson
Regional Administrator
Federal Emergency Management Agency
FRC 800 North Loop 288
Denton, TX 76209-3698

Mr. Adam Zerrenner
Field Supervisor
U.S. Fish & Wildlife Service
10711 Burnet Road, Suite 200
Austin, TX 78758

Colonel Charles H. Klinge, Jr.
Commander, District Engineer
USACE - Fort Worth District
819 Taylor Street
Fort Worth, TX 76102

STATE

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

Ms. Melanie Callahan
Executive Administrator
Texas Water Development Board
1700 North Congress Avenue.
Austin, TX 78711-3231

Mr. David Fulton
Director
Division of Aviation
Texas Department of Transportation
125 E. 11th Street
Austin, TX 78701

Mr. Mark Wolfe
Executive Director
Texas Historical Commission
P.O. Box 12276
Austin, TX 78711

Mr. Carlos Swonke
Director
Environmental Affairs Division
Texas Department of Transportation
125 E. 11th Street
Austin, TX 78701-2483

Mr. Mario G. Medina
District Engineer
TxDOT, San Antonio District
P.O. Box 29928
San Antonio, TX 78229-0928

Mr. Joel Anderson
Regional Director
Texas Commission on Environmental Quality
14250 Judson Road
San Antonio, TX 78233-4480

Mr. Jerry Patterson
Texas Land Commissioner
Texas General Land Office
1700 North Congress Avenue,
Suite 935
Austin, TX 78701-1495

LOCAL

Mr. Dean Danos
Executive Director
Alamo Area Council of Governments
8700 Tesoro Drive, Suite 700
San Antonio, TX 78217

Mr. Bill West
General Manager
Guadalupe-Blanco River Authority
933 East Court Street
Seguin, TX 78155

Mr. Roland Ruiz
General Manager
Edwards Aquifer Authority
900 East Quincy
San Antonio, TX 78215

Ms. Suzanne B. Scott
General Manager
San Antonio River Authority
100 East Guenther Street
San Antonio, TX 78204

Mr. Kelley Neumann
Senior Vice President
Strategic Resources
San Antonio Water System
P.O. Box 2449
San Antonio, TX 78298-2449

Mr. Mike Brinkmann
Vice President
San Antonio Water System
P.O. Box 2449
San Antonio, Texas 78298-2449

Mr. Bruce MacDougal
Executive Director
San Antonio Conservation Society
107 King William Street
San Antonio, TX 78204

Dr. Willis Mackey
Superintendent
Judson ISD
8012 Shin Oak Drive
Live Oak, TX 78233

Dr. Brian G. Gottardy
Superintendent
North East ISD
8961 Tesoro Drive
San Antonio, TX 78217

COMAL COUNTY

Mr. Trey Stoneham
County Executive Director
Caldwell-Hays-Comal County Farm Service Agency
1403-A Blackjack
Lockhart, TX 78644

Mr. Jim Scheele
President
Comal County Farm Bureau
1105 Eikel Street
New Braunfels, TX 78130-5599

Mr. Andrew Kim
Superintendent
Comal ISD
1404 IH 35 North
New Braunfels, TX 78130

Mr. David Renken
Comal County Economic Development
150 North Seguin Avenue
New Braunfels, TX 78130

Mr. Sherman Krause
Comal County Judge
150 North Seguin Ave
New Braunfels, TX 78130

Mr. Scott Haag
Comal County Commissioner, Precinct 2
150 North Seguin Avenue
New Braunfels, TX 78130

Ms. Susan Dvorak
Comal County Justice of the Peace,
Precinct 2
P.O. Box 250
Bulverde, TX 78163

FEDERAL/STATE/LOCAL AGENCIES CONTACTED BY CPS ENERGY
BULVERDE SUBSTATION AND TRANSMISSION PROJECT

Mr. Bill Krawietz
Mayor
City of Bulverde
30360 Cougar Bend
Bulverde, TX 78163-4569

Ms. Yvonne L. Chapman
Councilwoman
City of Bulverde
30360 Cougar Bend
Bulverde, TX 78163-4569

Mr. Rob Hurst
Councilman
City of Bulverde
30360 Cougar Bend
Bulverde, TX 78163-4569

Mr. Kirk Harrison
Councilman
City of Bulverde
30360 Cougar Bend
Bulverde, TX 78163-4569

Mr. Gene Hartman
Councilman
City of Bulverde
30360 Cougar Bend
Bulverde, TX 78163-4569

Mr. Ray Jeffrey
Councilman
City of Bulverde
30360 Cougar Bend
Bulverde, TX 78163-4569

Mr. John Nowak
Director of Public Works
City of Bulverde
30360 Cougar Bend
Bulverde, TX 78163-4569

Mr. E.A. Hoppe
City Administrator
City of Bulverde
30360 Cougar Bend
Bulverde, TX 78163-4569

Ms. Sherri L. Mosier
Executive Director
Bulverde Spring Branch Economic
Development Corporation
36101 FM 3159
New Braunfels, TX 78132

BEXAR COUNTY

Mr. David E. Marquez
Executive Director
Bexar County Economic Development
101 West Nueva, Suite 944
San Antonio, TX 78205

Mr. Nelson W. Wolff
Bexar County Judge
101 West Nueva, 10th Floor
San Antonio, TX 78205-3482

Mr. Sergio Rodriguez
Bexar County Commissioner, Precinct 1
101 W. Nueva, Suite 1007, 10th Floor
San Antonio, TX 78205

Mr. Paul Elizondo
Bexar County Commissioner, Precinct 2
101 W. Nueva, Suite 1007, 10th Floor
San Antonio, TX 78205

Mr. Kevin Wolff
Bexar County Commissioner, Precinct 3
101 W. Nueva, Suite 1007, 10th Floor
San Antonio, TX 78205

Mr. Tommy Adkisson
Bexar County Commissioner, Precinct 4
101 W. Nueva, Suite 1007, 10th Floor
San Antonio, TX 78205

Mr. Jeff Wentworth
Bexar County Justice of the Peace,
Precinct 3
8918 Tesoro Drive, Suite 300
San Antonio, TX 78217

Mr. Brian Hanson
County Executive Director
Bexar County Farm Service Agency
727 East Durango, Suite A-511
San Antonio, TX 78206-1203

Mr. Wayne Hofferichter
President
Bexar County Farm Bureau
7322 NE Loop 410
San Antonio, TX 78219-1710

Ms. Renee D. Green, P.E.
Director of Public Works/County Engineer
Public Works Department
Bexar County
233 North Pecos, Suite 420
San Antonio, TX 78207

Mr. Rene Dominguez
Director
Economic Development Department
City of San Antonio
Frost Bank Tower
100 West Houston Street, 19th Floor
San Antonio, TX 78205

Mr. Mario Obledo, Jr.
Bexar County Chief of Staff
101 W. Nueva, Suite 1007, 10th Floor
San Antonio, TX 78205

Mr. John Dugan
Director
Department of Planning & Community
Development
City of San Antonio
1400 South Flores Street
San Antonio, TX 78204

Mr. Majed A. Al-Ghafry
Director
Department of Public Works
City of San Antonio
114 West Commerce
San Antonio, TX 78205

Mr. Julián Castro
Mayor
City of San Antonio
P.O. Box 839966
San Antonio, TX 78283

Mr. Diego M. Bernal
Councilman, District 1
City of San Antonio
P.O. Box 839666
San Antonio, TX 78283

Ms. Ivy R. Taylor
Councilwoman, District 2
City of San Antonio
P.O. Box 839666
San Antonio, TX 78283

Ms. Rebecca J. Viagran
Councilwoman, District 3
City of San Antonio
P.O. Box 839666
San Antonio, TX 78283

Mr. Rey Saldana
Councilman, District 4
City of San Antonio
P.O. Box 839666
San Antonio, TX 78283

Ms. Shirley Gonzales
Councilwoman, District 5
City of San Antonio
P.O. Box 839666
San Antonio, TX 78283

Mr. Ray Lopez
Councilman, District 6
City of San Antonio
P.O. Box 839666
San Antonio, TX 78283

Mr. Cris Medina
Councilman, District 7
City of San Antonio
P.O. Box 839666
San Antonio, TX 78283

Mr. Ron Nirenberg
Councilman, District 8
City of San Antonio
P.O. Box 839666
San Antonio, TX 78283

Ms. Elisa Chan
Councilman, District 9
City of San Antonio
P.O. Box 839666
San Antonio, TX 78283

Mr. Carlton Soules
Councilman, District 10
City of San Antonio
P.O. Box 839666
San Antonio, TX 78283

Ms. Nancy Cain
City Administrator
City of Garden Ridge
9400 Municipal Pkwy
Garden Ridge, TX 78266

Mr. Andrew Dalton
Mayor
City of Garden Ridge
9400 Municipal Pkwy
Garden Ridge, TX 78266

Mr. John R. McCaw
Alderman
City of Garden Ridge
9400 Municipal Pkwy
arden Ridge, TX 78266

Ms. Nadine Knaus
Alderman
City of Garden Ridge
9400 Municipal Pkwy
Garden Ridge, TX 78266

Mr. Bryan Lantzy
Alderman
City of Garden Ridge
9400 Municipal Pkwy
Garden Ridge, TX 78266

Mr. Joseph Britan
Mayor Pro Tempore
City of Garden Ridge
9400 Municipal Pkwy
Garden Ridge, TX 78266

Mr. Bobby Roberts
Alderman
City of Garden Ridge
9400 Municipal Pkwy
Garden Ridge, TX 78266

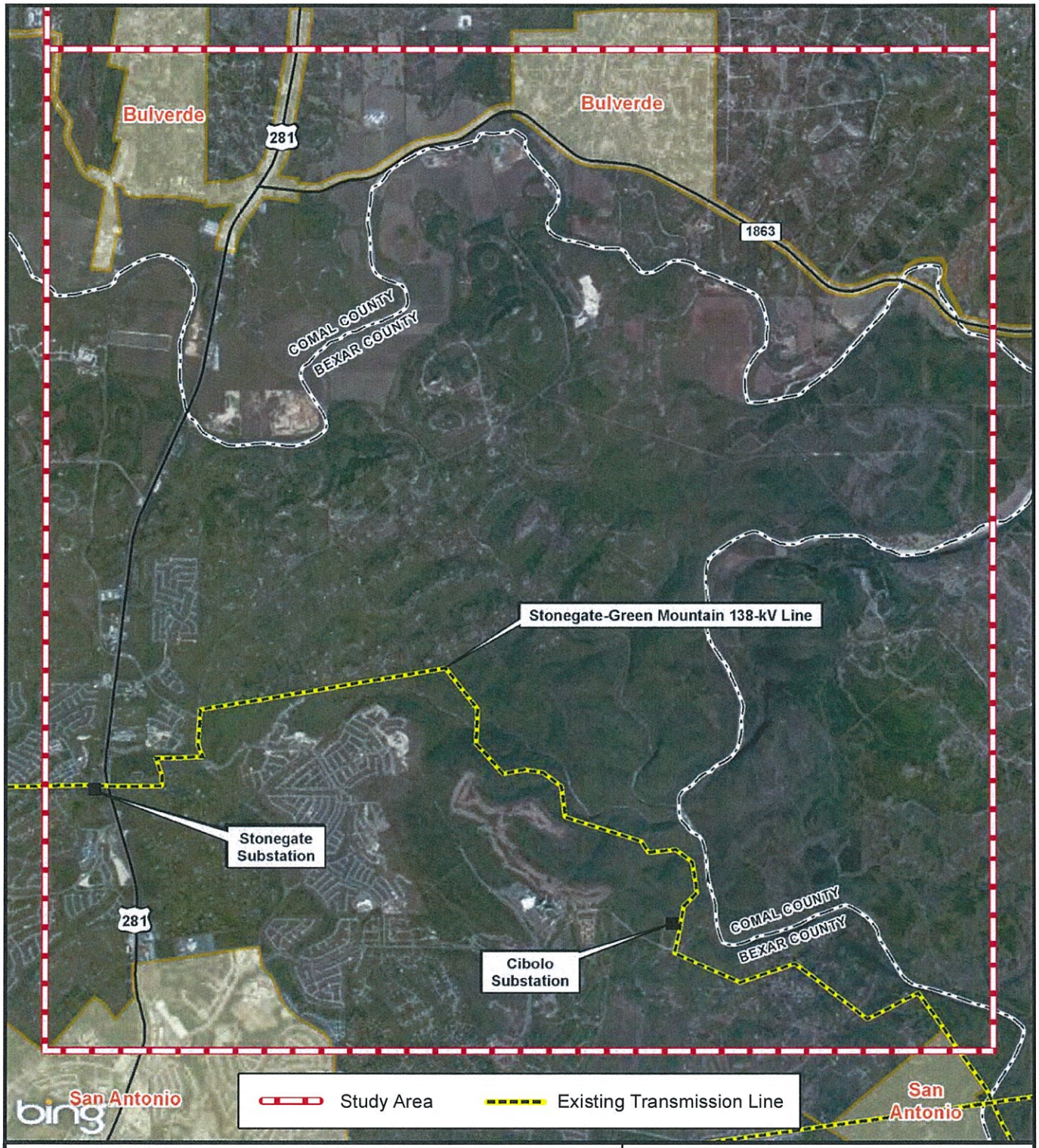
FEDERAL/STATE (Email)

The Honorable Lamar Smith
Guaranty Federal Building
1100 NE Loop 410, Suite 640
San Antonio, TX 78209

The Honorable Donna Campbell
9601 McAllister Freeway, Suite 150
San Antonio, TX 78216

The Honorable Lyle Larson
14607 San Pedro Ave., Suite 180
San Antonio, TX 78232

The Honorable Doug Miller
387 W. Mill Street
New Braunfels, TX 78130



0 0.5 1 Miles

ATKINS

STUDY AREA LOCATION
BULVERDE SUBSTATION AND
TRANSMISSION LINE PROJECT

Path: N:\Clients\C_D\CPS_Energy\100032882\geo\agency_contact_map.mxd

Texas Department of Transportation

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

Mr. Derek Green
Atkins North America, Inc.
6504 Bridge Point Parkway
Suite 200
Austin, Texas 78730

August 14, 2013

Dear Mr. Green;

I received your letter dated August 7, 2013 concerning Atkins job number 100032882.

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:

77.9 (b) 100 to 1 for a horizontal distance of 20,000 feet from the nearest point of the nearest runway of each airport specified in paragraph (a)(5) of this section with its longest runway greater 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.

77.9 (a) Any construction or alteration of more than 200' above the surface of the ground at its location

77.9 (2) Any air navigation facility, airport visual approach or landing aid, aircraft arresting device, or meteorological device meeting FAA-approved siting criteria or an appropriate military service siting criteria on military airports, the location and height of which are fixed by its functional purpose;

There is one public use airport in or near the study area. Bulverde Airpark (1T8) at airport reference point 29-44-20.8000N / 098-27-04.0610W. The single runway is 2890 feet in length. There are no separate public use heliports in or near the study area.

If the criterion of any of the above part FAR 77.9 rules are met by the proposed routing, the FAA must be notified in four copies using FAA Form 7460-1, "Notice of Proposed Construction or Alteration". This form, supporting documents, and how to file electronically are available at http://oeaaa.faa.gov

Sincerely,

William B. Gunn
Compliance

TEXAS GENERAL LAND OFFICE

JERRY PATTERSON, COMMISSIONER

August 20, 2013

Derek Green
Atkins North America, Inc.
6504 Bridge Point Parkway, Suite 200
Austin, Texas 78730-5091

Re: Proposed CPS Energy Bulverde Substation Project
Comal or Bexar County, Texas

Dear Mr. Green:

On behalf of Commissioner Patterson, I would like to thank you for your letter concerning the above referenced project.

Using your map depicting the project preliminary study area, it does not appear that the General Land Office will have environmental issues or land use constraints at this time.

When a final route/location for this proposed project has been determined, please contact me and we can assess the route/location and determine if the project will cross any streambeds or Permanent School Fund (PSF) land that would require an easement from our agency.

In the interim, if you would like to speak to me further on this project, feel free to contact me by email at glenn.rosenbaum@glo.texas.gov or by phone at (512) 463-8180.

Again, thank you for your inquiry.

Sincerely,

Glenn Rosenbaum
Team Leader, Right-of-Way Department
Asset Inspection-Professional Services Program

Texas General Land Office
Stephen F. Austin Building • 1700 North Congress Avenue, Texas 78701-1495
Post Office Box 12873 • Austin, Texas 78711-2873
Phone: 512-463-5001 • 800-998-4GLO
www.glo.state.tx.us

TEXAS HISTORICAL COMMISSION
real places telling real stories

August 30, 2013

Derek Green
Senior Project Manager
Atkins North America, Inc.
6504 Bridge Point Parkway, Suite 200
Austin, TX 78730

Re: Project review under the Antiquities Code of Texas and the National Historic Preservation Act
Proposed CPS Energy Bulverde Substation Project (Project #100032882)

Dear Mr. Green:

Thank you for your correspondence describing the above referenced project. This letter serves as comment on the proposed undertaking from the Executive Director of the Texas Historical Commission and the State Historic Preservation Officer.

The review staff, led by Bradford Jones, requires more information to complete our review. Our records indicate that numerous archeological sites have been previously recorded within the general project area, but there has been limited professional archeological survey. Currently there is insufficient information to make a determination as to whether the proposed project has the potential to impact cultural resources in the area or determine whether a cultural resources survey is necessary. In order to make a determination, we request that a new coordination letter be submitted once a more defined project area has been established with details regarding the proposed project. Please refer to the Project Review section of our website (http://www.thc.state.tx.us/project-review/what-send-project-review) for additional details on what to send for project review.

Thank you for your cooperation 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 Bradford Jones at 512/463-5865.**

Sincerely,

for
Mark Wolfe, State Historic Preservation Officer

MW/bj

Texas Water Development Board

P.O. Box 13231, 1700 N. Congress Ave.
Austin, TX 78711-3231, www.twdb.texas.gov
Phone (512) 463-7847, Fax (512) 475-2053

September 6, 2013

Mr. Derek Green
Senior Project Manager
Atkins North America Inc.
6504 Bridge Point Parkway, Suite 200
Austin, TX 78730

Re: Proposed CPS Energy Bulverde Substation Project

Dear Mr. Green:

We were informed of your request for information concerning environmental assessment for the proposed construction of the new Bulverde electric substation near U.S. Highway 281 and F.M. 1863 in Comal or Bexar County. To plan for the state's water resources and provide affordable water and wastewater services, the Texas Water Development Board (TWDB) provides planning, geographic data collection and dissemination, and financial and technical assistance services. TWDB is not a regulatory agency and does not issue any permits.

Based on the map and information provided, it appears that the proposed transmission line would not conflict with any recommended water management strategies in the regional or state water plans. Therefore, we have no specific comments in regard to the proposed project.

If you have any further questions, please contact me at (512) 936-0852.

Sincerely,

W. David Meesey
Program Specialist VII
Water Resources Planning and Information

TEXAS PARKS & WILDLIFE

Life's better outside.®

Commissioners

T. Dan Friedkin
Chairman
Houston

Ralph H. Duggins
Vice-Chairman
Fort Worth

Antonio Falcon, M.D.
Rio Grande City

Dan Allen Hughes, Jr.
Beeville

Bill Jones
Austin

James H. Lee
Houston

Margaret Martin
Boerne

S. Reed Morian
Houston

Dick Scott
Wimberley

Lee M. Bass
Chairman-Emeritus
Fort Worth

Carter P. Smith
Executive Director

October 8, 2013

Derek Green
Atkins North America, Inc.
6504 Bridge Point Parkway, Suite 200
Austin, TX 78730

RE: Request for information for proposed CPS Energy Bulverde Substation, Bexar County
Project #100032882

Dear Mr. Green:

This letter is in response to your request for information concerning potential impacts upon fish, wildlife, and plant resources or other land use concerns associated with the proposed construction of a new electric substation. Atkins North America, Inc. (Atkins) is preparing an Environmental Assessment (EA) and Alternative Site Analysis for the proposed project.

Project Description

CPS Energy proposes to construct a new electric substation in the north central area of San Antonio near U.S. Highway (US) 281 and Farm-to-Market Road (FM) 1863 in Comal County and Bexar County, Texas. The new substation would require an area of approximately three to five acres and would be connected to CPS Energy's existing Stonegate to Green Mountain 138-kilovolt (kV) transmission line by a double circuit transmission line.

Texas Parks and Wildlife Department (TPWD) staff reviewed the information provided and offer the following comments.

TPWD Review Methods

As part of the review, TPWD searched the Texas Natural Diversity Database (TXNDD) of known records for species and rare resources within 1.5 miles of the study area boundary. TXNDD Element Occurrence (EOID) records found within the delineated study area boundary and extending 1.5 miles outside of that boundary provide a best estimate of the species and other rare resources that could potentially occur in the project's study area. **A lack of site-specific records should not be interpreted as presence/absence data, but instead that little information is available to date.**

Rare and Protected Species

Based on the project as presented, the TPWD annotated county list of rare species for Bexar and Comal counties, and presently known TXNDD records for the general project area, the following listed species could be impacted by proposed project activities *if suitable habitat* is present:

Federal and State Listed Endangered

Bracken Bat Cave meshweaver (*Cicurina venii*)
Cokendolpher cave harvestman (*Texella cokendolpheri*)
Government Canyon Bat Cave meshweaver (*Cucurina vespera*)
Government Canyon Bat Cave spider (*Neoleptoneta microps*)
Madla Cave meshweaver (*Cicurina madla*)
Robber Baron Cave meshweaver (*Cicurina baronia*)
Black-capped Vireo (*Vireo atricapilla*)
* Golden-cheeked Warbler (*Setophaga chrysoparia*)
* A ground beetle (*Rhadine exilis*)
A ground beetle (*Rhadine infernalis*)

State Listed Threatened

* Cascade Caverns salamander (*Eurycea latitans complex*)
* Comal blind salamander (*Eurycea tridentifera*)
Toothless blindcat (*Trogloglanis pattersoni*)
Widemouth blindcat (*Satan eurystomus*)
Timber/Canebrake rattlesnake (*Crotalus horridus*)

Species of Concern

Texas salamander (*Eurycea neotenes*)
A cave obligate crustacean (*Monodella texana*)
Cave myotis bat (*Myotis velifer*)
Plains spotted skunk (*Spilogale putorius interrupta*)
Texas garter snake (*Thamnophis sirtalis annectens*)
Big red sage (*Salvia pentstemonoides*)
Bracted twistflower (*Streptanthus bracteatus*)
Hill Country wild-mercury (*Argythamnia aphoroides*)

Special Features and Natural Communities

* Bat Roost
* Plateau Live Oak-Curley Mesquite Series (*Quercus fusiformis-Hilaria belangeri* Series)
* Karst Zone 1 and 2

Review of the TXNDD indicates that occurrences of the species or special features shown above preceded by an asterisk (*) have been documented in and/or within 1.5 miles of the project study area. Element Occurrence Records and a map of the project area are included to assist in project planning.

Please be aware that determining the actual presence of a species in a given area depends on many variables including daily and seasonal activity cycles, environmental activity cues, preferred habitat, transiency and population density (both wildlife and human). The absence of a species can be demonstrated only with great difficulty and then only with repeated negative observations, taking into account all the variable factors contributing to the lack of detectable presence.

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 presence, 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; for the most current and accurate information, please contact TPWD at texasnatural.diversitydatabase@tpwd.texas.gov.

Please review the most current TPWD county lists as other rare species could be present depending upon habitat availability. These lists are available online at http://www.tpwd.state.tx.us/gis/ris/es/default.aspx

For the U.S. Fish and Wildlife Service (USFWS) rare species lists please visit: http://eco.fws.gov/tess_public/serviet/gov.doi.tess_public.serviets.EntryPage.

Federal Regulations

Endangered Species Act (ESA)

Federally-listed animal species and their habitat are protected from "take" on any property by the ESA. Take of a federally-listed species can be allowed if it is "incidental" to an otherwise lawful activity and must be permitted in accordance with Section 7 or 10 of the ESA. Federally-listed plants are not protected from

take except on lands under federal/state jurisdiction or for which a federal/state nexus (i.e., permits or funding) exists. Any take of a federally listed species or its habitat without the required take permit (or allowance) from U.S. Fish and Wildlife Service (USFWS) is a violation of the ESA.

Much of north and northwest Bexar County consists of vegetation assemblages that provide highly suitable habitat for Golden-cheeked Warblers.

> **Recommendation:** In order to avoid potential negative impacts to Golden-cheeked Warblers or suitable warbler habitat, TPWD recommends locating the proposed substation and associated transmission line within previously disturbed (i.e., cleared) areas between the existing Stonegate-Green Mountain transmission line and the US 281/FM 1863 area.

The proposed project study area boundary also includes Karst Zones 1 and 2, as identified in the USFWS 2011 Final Bexar County Karst Invertebrate Recovery Plan. Karst Zones 1 and 2 are known to contain listed karst invertebrate species or have a high probability of containing suitable karst invertebrate habitat, respectively. Karst Zone 3, karst areas that most likely do not contain listed karst species, also occurs within the project area.

> **Recommendation:** TPWD recommends locating the project outside of Karst Zones 1 or 2. Locating the proposed substation within Karst Zones 1 or 2 or within presumptive Golden-cheeked Warbler habitat would require coordination with the USFWS-Ecological Services Office in Austin, Texas (512-490-0057).

Migratory Bird Treaty Act (MBTA)

The Migratory Bird Treaty Act (MBTA) implicitly prohibits intentional *and unintentional* take of migratory birds, including their nests and eggs, except as permitted by the USFWS. This protection applies to most native bird species, including ground nesting species. Although not documented in the TXNDD, many bird species which are not listed as *threatened* or *endangered* are protected by the MBTA and are known to be year-round or seasonal residents or seasonal migrants through the proposed project area. Additional information regarding the MBTA is available from the USFWS-Southwest Regional Office (Region 2) at (505) 248-7882.

Review of TPWD's high resolution land classification map, the Ecological Mapping System of Texas (EMST), indicates that the proposed project study area

includes Ashe Juniper Motte and Woodland, Deciduous Oak/Evergreen Motte and Woodland, Limestone Savanna Grasslands and other minor ecological systems all of which may provide suitable high quality habitat used as nesting, feeding, and cover sites for birds.

Recommendation: In order to avoid potential negative impacts to birds and wildlife habitat, TPWD recommends identifying existing or previously disturbed areas to locate the proposed substation and transmission line, if possible.

Regardless of where the substation is located, TPWD recommends scheduling any vegetation clearing or trampling outside of the April 1-July 15 migratory bird nesting season in order to fully comply with the MBTA. Contractors should be made aware of the potential of encountering migratory birds (either nesting or wintering) in the proposed project site and be instructed to avoid negatively impacting them.

If construction activities must be scheduled to occur during the nesting season, TPWD recommends that the vegetation to be impacted should be surveyed for active nests by a qualified biologist prior to clearing. If active nests are observed during surveys, TPWD recommends a 150-foot buffer of vegetation remain around the nests until the young have fledged or the nest is abandoned.

Regardless of the location of the substation and associated transmission line, due to the high bird diversity in the area and the number of resident and migrant birds that occur in the area, TPWD recommends the transmission line be marked with line markers or bird flight diverters (BFD) to reduce the potential of birds flying into the lines.

Also, to prevent electrocution of perching birds, TPWD recommends utilizing avian-safe designs that provide appropriate separation between two energized phases or between an energized phase and grounded equipment. TPWD recommends covering energized components with appropriate bird protection materials where adequate spacing cannot be achieved, such as installing insulated jumper wires, insulator covers, bushing caps, and arrester caps.

Line alterations to prevent bird electrocutions should not necessarily be implemented *after* such events occur as all electrocutions may not be known or documented. Incorporation of preventative measures along

portions of the routes that are most attractive to birds (as indicated by frequent sightings) prior to any electrocutions is a much preferred alternative.

TPWD recommends the transmission line design should utilize avian safety features described in the recently revised:

Avian Power Line Interaction Committee (APLIC). 2012. *Reducing Avian Collisions with Power Lines: The State of the Art in 2012.* Edison Electric Institute and APLIC. Washington, D.C.

In particular, the overhead ground wire should be marked with line markers to increase its visibility. Additional recommendations are available in the document entitled, "TPWD Recommendations for Electrical Transmission/Distribution Line Design and Construction" available online at the TPWD website: http://www.tpwd.state.tx.us/huntwild/wild/wildlife_diversity/habitat_assessment/media/tpwd_electrical_transmission.pdf

State Regulations

Parks and Wildlife Code

State law prohibits any take (incidental or otherwise) of state-listed species. Laws and regulations pertaining to state-listed endangered or threatened animals are contained in Chapters 67 and 68 of the Texas Parks and Wildlife (TPW) Code; laws pertaining to endangered or threatened plants are contained in Chapter 88 of the TPW Code. There are penalties, which may include fines and/or jail time in addition to payment of restitution values, associated with take of state-listed species. Please see "Laws and Regulations Applicable to TPWD Review" at: http://www.tpwd.state.tx.us/huntwild/wild/wildlife_diversity/habitat_assessment/laws.phtml.

The potential occurrence of state-listed species in the project area is primarily dependent upon the availability of suitable habitat. Direct impacts to high quality or suitable habitat therefore are directly proportional to the magnitude and potential to directly impact state-listed species. State-listed species that are most likely to occur in the project area are either dependent on aquatic environments (both surface and subsurface) or riparian corridors along creeks in the project area.

Recommendation: The EA should include an inventory of existing natural resources within the alternative substation construction sites; specific evaluations should be designed to predict project impacts upon these natural resources including potential impacts upon state-listed species. Project impacts will be avoided and/or minimized by locating the proposed substation and transmission line route in previously disturbed areas or in areas that do not contain high or medium quality habitat. Clearing any riparian vegetation or potential Golden-cheeked Warbler nesting habitat to locate the proposed substation and transmission line is discouraged by TPWD.

Bracken Cave, home to the world's largest bat colony, is located within the boundary of the project study area. The typical flight path of the emerging and returning bats is to and from the south-southeast of the cave entrance. The southeast corner of the project study area lies within the general bat coverage area following emergence.

Recommendation: To avoid potential bat collision impacts, TPWD recommends avoiding the placement of the transmission line route or substation in the southeastern corner of the project study area.

Please provide TPWD with a copy of the resulting environmental assessment prior to submittal to the PUC, if applicable, as per the interagency agreement between TPWD and the PUC.

TPWD advises review and implementation of these recommendations in the preparation of the environmental document for the project. Please contact me at (361) 825-3240 or Russell.hooten@tpwd.texas.gov if you have any questions or we may be of further assistance.

Sincerely,

Russell Hooten
Wildlife Habitat Assessment Program
Wildlife Division

/rh 7306

Attachments

cc: Mohammed Ally, Public Utilities Commission of Texas (w/o attachments)

Code Key for Printouts from
Texas Parks and Wildlife Department
Texas Natural Diversity Database (TXNDD)

This information is for your assistance only; due to continuing data updates, vulnerability of private land to trespass and of species to disturbance or collection, **please refer all requesters to our office to obtain the most current information available.** Also, please note, identification of a species in a given area does not necessarily mean the species currently exists at the point or area indicated.

LEGAL STATUS AND CONSERVATION RANKS

FEDERAL STATUS (as determined by the US Fish and Wildlife Service)

LE	Listed Endangered
LT	Listed Threatened
PE	Proposed to be listed Endangered
PT	Proposed to be listed Threatened
PDL	Proposed to be Delisted (Note: Listing status retained while proposed)
SAE, SAT	Listed Endangered on basis of Similarity of Appearance, Listed Threatened on basis of Similarity of Appearance
DL	Delisted Endangered/Threatened
C	Candidate. USFWS has substantial information on biological vulnerability and threats to support proposing to list as threatened or endangered. Data are being gathered on habitat needs and/or critical habitat designations.
C*	C, but lacking known occurrences
C**	C, but lacking known occurrences, except in captivity/cultivation
XE	Essential Experimental Population
XN	Non-essential Experimental Population
Blank	Species is not federally listed

TX PROTECTION (as determined by the Texas Parks and Wildlife Department)

E	Listed Endangered
T	Listed Threatened
Blank	Species not state-listed

GLOBAL RANK (as determined by NatureServe)

G1	Critically imperiled globally, extremely rare, typically 5 or fewer viable occurrences
G2	Imperiled globally, very rare, typically 6 to 20 viable occurrences
G3	Very rare and local throughout range or found locally in restricted range, typically 21 to 100 viable occurrences
G4	Apparently secure globally
G5	Demonstrably secure globally
GH	Of historical occurrence through its range
GU	Possibly in peril range-wide, but status uncertain
G#G#	Ranked within a range as status uncertain
GX	Apparently extinct throughout range
Q	Rank qualifier denoting taxonomic assignment is questionable
#?	Rank qualifier denoting uncertain rank
C	In captivity or cultivation only
G#T#	"G" refers to species rank; "T" refers to variety or subspecies rank

STATE (SUBNATIONAL) RANK (as determined by the Texas Parks and Wildlife Department)

S1	Critically imperiled in state, extremely rare, vulnerable to extirpation, typically 5 or fewer viable occurrences
S2	Imperiled in state, very rare, vulnerable to extirpation, typically 6 to 20 viable occurrences
S3	Rare or uncommon in state, typically 21 to 100 viable occurrences
S4	Apparently secure in State
S5	Demonstrably secure in State
S#S#	Ranked within a range as status uncertain
SH	Of historical occurrence in state and may be rediscovered
SU	Unrankable – due to lack of information or substantially conflicting information
SX	Apparently extirpated from State
SNR	Unranked – State status not yet assessed
SNA	Not applicable – species id not a suitable target for conservation activities
?	Rank qualifier denoting uncertain rank in State

ELEMENT OCCURRENCE RECORD

Element Occurrence Record (EOR) Spatial and tabular record of an area of land and/or water in which a species, natural community, or other significant feature of natural diversity is, or was, present and associated information; may be a single contiguous area or may be comprised of discrete patches or subpopulations

Occurrence # Unique number assigned to each occurrence of each element when added to the NDD

LOCATION INFORMATION

Watershed Code Eight digit numerical code determined by US Geological Survey (USGS)

Watershed Name of watershed as determined by USGS

Quadrangle Name of USGS topographical map

Directions Directions to geographic location where occurrence was observed, as described by observer or in source

SURVEY INFORMATION

First/Last Observation Date a particular occurrence was first/last observed; refers only to species occurrence as noted in source and does not imply the first/last date the species was present

Survey Date If conducted, date of survey

EO Type State rank qualifiers:

- **M** Migrant – species occurring regularly on migration at staging areas, or concentration along particular corridors; status refers to the transient population in the State
- **B** Qualifier indicating basic rank refers to the breeding population in State
- **N** Qualifier indicating basic rank refers to the non-breeding population in State

EO Rank

A	Excellent	**AI**	Excellent, Introduced
B	Good	**BI**	Good, Introduced
C	Marginal	**CI**	Marginal, Introduced
D	Poor	**DI**	Poor, Introduced
E	Extant/Present	**EI**	Extant, Introduced
H	Historical/No Field Information	**HI**	Historical, Introduced
X	Destroyed/Extirpated	**XI**	Destroyed, Introduced
O	Obscure	**OI**	Obscure, Introduced

EO Rank Date Latest date EO rank was determined or revised

Observed Area Acres, unless indicated otherwise

COMMENTS

Description General physical description of area and habitat where occurrence is located, including associated species, soils, geology, and surrounding land use

Comments Comments concerning the quality or condition of the element occurrence at time of survey

Protection Comments Observer comments concerning legal protection of the occurrence

Management Comments Observer comments concerning management recommendations appropriate for occurrence conservation

DATA

EO Data Biological data; may include number of individuals, vigor, flowering/fruiting data, nest success, behaviors observed, or unusual characteristic, etc.

SITE

Site Name Title given to site by surveyor

MANAGED AREA INFORMATION

Managed Area Name Place name or (on EOR printout) name of area when the EO is located within or partially within an area identified for conservation, such as State or Federal lands, nature preserves, parks, etc.

Alias Additional names the property is known by

Acres Total acreage of property, including non-contiguous tracts

Manager Contact name, address, and telephone number for area or nearest area land steward

Please use one of the following citations to credit the source for the printout information:

Texas Natural Diversity Database. [year of printouts]. Wildlife Diversity Program of Texas Parks & Wildlife Department. [day month year of printouts].

Texas Natural Diversity Database. [year of printouts]. Element occurrence printouts for [scientific name] *records # [occurrence number(s)]. Wildlife Diversity Program of Texas Parks & Wildlife Department. [day month year of printouts]. *Use of record #'s is optional.

Revised 1 Apr 2008

Green, Derek

From: Green, Derek
Sent: Friday, August 16, 2013 11:20 AM
To: 'monica.reyes@tceq.texas.gov'
Subject: CPS Bulverde study area corners coordinates

Here you go Monica.

Have a great weekend.

Lat	Long	Corner
29.757755	-98.460643	NW
29.757243	-98.345686	NE
29.651113	-98.346366	SE
29.651624	-98.461204	SW

Derek Green
Senior Project Manager - Environment and Energy

ATKINS

6504 Bridge Point Pkwy, Austin, TX, 78730 | Tel: +1 (512) 342 3380 | Fax: +1 (512) 327 2453
Email: derek.green2@atkinsglobal.com | Web: www.atkinsglobal.com/northamerica www.atkinsglobal.com

DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P.O. BOX 17300
FORT WORTH, TEXAS 76102-0300

REPLY TO
ATTENTION OF

August 16, 2013

Planning, Environmental, and Regulatory Division
Regulatory Branch

SUBJECT: Project Number SWF-2013-00379, CPS Energy Bulverde Substation Project

Derek Green
Atkins North America, Inc.
6504 Bridge Point Parkway
Suite 200
Austin, TX 78730

Dear Mr. Green:

Thank you for your letter received August 12, 2013, concerning a proposal by CPS Energy to construct a new electric substation located in the city of San Antonio, Bexar County, Texas. This project has been assigned Project Number SWF-2013-00379. Please include this number in all future correspondence concerning this project.

Mr. Eric Dephouse has been assigned as the regulatory project manager for your request and will be evaluating it as expeditiously as possible.

You may be contacted for additional information about your request. For your information, please reference the Fort Worth District Regulatory Branch homepage at www.swf.usace.army.mil/Missions/Regulatory.aspx and particularly guidance on submittals at www.media.swf.usace.army.mil/pubdata/environ/regulatory/introduction/submital.pdf and mitigation at www.usace.army.mil/Missions/Regulatory/Permitting/Mitigation.aspx that may help you supplement your current request or prepare future requests.

If you have any questions about the evaluation of your submittal or would like to request a copy of one of the documents referenced above, please contact Mr. Eric Dephouse at the address above or telephone 817-886-1820 and refer to your assigned project number. Please note that it is unlawful to start work without a Department of the Army permit if one is required.

Please help the Regulatory Program improve its service by completing the survey on the following website: http://per2.nwp.usace.army.mil/survey.html.

Stephen L Brooks
Chief, Regulatory Branch

Green, Derek

From: Dephouse, Eric SWF [Eric.J.Dephouse@usace.army.mil]
Sent: Monday, August 19, 2013 10:54 AM
To: Green, Derek
Subject: SWF-2013-00379 CPS Energy Bulverde Substation Project (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Derek:

Per our discussion, I've been assigned USACE Project No. SWF-2013-00379 CPS Energy Bulverde Substation Project, which appears incomplete. In order for us to continue evaluating your submittal, please address the following:

1. Please submit a jurisdictional determination for the project site. Using the JD, submit WOUS impact exhibits with the activity types labeled (ie. footprint of substation). Include permanent and temporary impact areas with cross-hatching & permanent and temporary impact acreages and LF "called-out", with all information overlaid on the most recent aerial possible. If available, please submit engineered drawings (plan & profile view and technical details) for the project. After review of the materials submitted we will determine whether a permit is required, and if so, which type.

Based on the responses to the items above, additional completeness items may be required to continue our review of the submittal. Responses must be via hardcopy - we cannot accept electronic submittals during any phase of the permitting process. Please use the project
If you have any further questions or concerns, please feel free to contact me at (817) 886-1820 or eric.j.dephouse@usace.army.mil

Respectfully,

Eric Dephouse

Eric Dephouse, B.S., M.B.A., P.W.S.
Project Manager
U.S. Army Corps of Engineers
Fort Worth District CESWF-PER-R
819 Taylor Street, Room 3A37
Fort Worth, Texas 76102-0300
Phone: (817) 886-1820
Fax: (817) 886-6493
Email: eric.j.dephouse@usace.army.mil
www.swf.usace.army.mil
http://www.wetlandcert.org/search.html

Please help the Regulatory Program improve its service by completing the survey on the following website: http://per2.nwp.usace.army.mil/survey.html

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

FEMA

FEDERAL EMERGENCY MANAGEMENT AGENCY
REGION VI
MITIGATION DIVISION

NOTICE REVIEW/ENVIRONMENTAL CONSULTATION

☐ We have no comments to offer. ☒ We offer the following comments:

WE WOULD REQUEST THAT THE COUNTIES FLOODPLAIN ADMINISTRATORS BE CONTACTED FOR THE REVIEW AND POSSIBLE PERMIT REQUIREMENTS FOR THIS PROJECT. IF FEDERALLY FUNDED, WE WOULD REQUEST PROJECT TO BE IN COMPLIANCE WITH EO11988 & EO 11990.

REVIEWER:

Mayra G. Diaz
Floodplain Management and Insurance Branch
Mitigation Division
(940) 898-5541

DATE: August 16, 2013

United States Department of Agriculture
NRCS
Natural Resources Conservation Service

101 S. Main Street
Temple, TX 76501-6624
Phone: 254-742-9826
FAX: 254-742-9859

August 21, 2013

Atkins North America, Inc.
6504 Bridge Point Parkway
Suite 200
Austin, Texas 78730

Attention: Derek Green

Subject: LNU-Farmland Protection
Proposed Bulverde Substation Project
Comal and Bexar County, Texas

We have reviewed the information provided in your correspondence dated August 7, 2013 concerning the proposed substation construction in Comal and Bexar County, Texas. This review is part of the National Environmental Policy Act (NEPA) evaluation for CPS Energy. We have evaluated the proposed site as required by the Farmland Protection Policy Act (FPPA).

Based on the map provided, a determination regarding the environmental effects of the proposed project cannot be made without knowing the exact location of the site. There are approximately 4500 acres of prime farmland in your area of interest. There are no hydric soils listed. If the project is being funded by a federal agency it may require a FPPA rating. If federal funds or technical assistance are not involved, the project is exempt per (Part 523-Farmland Protection Policy Act Manual; Subpart B; 523.10, B., (8)).

If you have any questions, please contact me at (254) 742-9854, Fax (254) 742-9859 or by email at drew.kinney@tx.usda.gov.

Sincerely,

Drew Kinney

Drew Kinney
NRCS GIS Specialist
Attachment

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

For Informational Purposes

To Whom It May Concern:

The official source for current soil survey information is Web Soil Survey at http://websoilsurvey.nrcs.usda.gov. Enclosed is a pamphlet about the website.

Farmland Classification maps can be obtained by following the steps below:

Delineate your area of interest (AOI) and create an AOI, or create an AOI from a zipped shape file. Go to the Soil Data Explorer tab, then the Suitability's and Limitations for Use tab, and then under the Land Classifications list of reports, run the Farmland Classification report. Print or save the report to a file, or add it to the shopping cart and produce a Custom Soil Resource Report to submit to us electronically, or print it out for mailing.

NRCS Farmland Policy Protection Act Form AD-1006 or NRCS-CPA-106 can be obtained at the following URL's respectively:
http://www.usda.gov/rus/water/ees/pdf/ad1006.pdf
http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1045395.pdf

NRCS Conservation Easements for Texas can be obtained at the following URL to determine if your project overlaps with any conservation easements:
http://www.tx.nrcs.usda.gov/easements.html

NRCS Conservation Easements by state can be obtained at the following URL:http://datagateway.nrcs.usda.gov/GDGOrder.aspx

If you have any questions, please contact the Texas State Soil Scientist at (254) 742-9863.

Green, Derek

From: Belton, Moni [moni_belton@fws.gov]
Sent: Tuesday, September 10, 2013 12:30 PM
To: Green, Derek
Subject: ESA guidelines for CPS Energy
Attachments: Attch 1_Austin ESFO Sect7 letter_2012.pdf

Mr. Green,

The U.S. Fish and Wildlife Service (Service) appreciates the opportunity to comment on the proposed CPS Energy Bulverde Substation Project located in Comal/Bexar County, Texas.

Attached are guidelines for Section 7 of the Endangered Species Act. Federally listed species for Texas Counties can be found at http://www.fws.gov/southwest/es/ES_Lists_Main.cfm. A qualified biologist should evaluate the proposed site for Federally listed species habitat.

The Service is the principal federal agency charged with protecting habitat and enhancing populations of migratory birds that spend all or part of their lives in the United States. All migratory birds are a trust resource responsibility of the Service. Examples of resources include the Texas Breeding Bird Atlas, E-bird lists, and U.S. Geological Survey's North American Breeding Bird Surveys. Additional information and recommendations might be obtained from the Service's Region 2 Division of Migratory Birds (http://www.fws.gov/southwest/migratorybirds/staff.html).

Meteorological towers constructed in association with electric substations are often similar in design to typical communications towers: tall, lighted, lattice structured, and guyed. These types of towers can be problematic for birds, particularly during inclement weather, as they enter the lighted area, become reluctant to leave it, and suffer mortality as they circle the structure and collide with the guy wires or the lattice tower itself. We recommend following the voluntary guidance set forth in *U.S. Fish and Wildlife Service Interim Guidelines for Recommendations on Communications Tower Siting, Constructions, Operation and Decommissioning,* found online at: http://www.fws.gov/habitatconservation/communicationtowers.html, to minimize the threat of avian mortality at these towers. Monitoring at these towers would provide insight into the effectiveness of the minimization measures. We request the results of any wildlife monitoring and any data obtained regarding wildlife mortality at towers associated with this project.

If additional powerlines are proposed, the Service recommends the installation of underground rather than overhead power lines whenever possible. For new overhead lines or retrofitting of old lines, we recommend that project developers implement, to the maximum extent practicable, the Avian Power Line Interaction Committee guidelines found at http://www.aplic.org/.

Thank you for working to conserve the nation's trust wildlife resources. Please refer to the Service Consultation number 02ETAU00-2013-CPA-0032 for any future questions. If you have any questions on these comments, please contact Moni Belton at 281-286-8282 ext 233

Thank you, Moni

--

Moni Belton
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service

17629 El Camino Real #211
Houston TX, 77058
281-286-8282 ext 233

United States Department of the Interior

FISH AND WILDLIFE SERVICE
10711 Burnet Raod, Suite 200
512 490-0057
Fax 512 490-0974

FEB 15 2012

Thank you for your request for threatened and endangered species information in the Austin Ecological Services 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.

Please note that while a Federal agency may designate a non-Federal representative to conduct informal consultation or prepare a biological assessment, the Federal agency must notify the U.S. Fish and Wildlife Service (Service) in writing of such designation. The Federal agency shall also independently review and evaluate the scope and contents of a biological assessment prepared by their designated non-Federal representative before that document is submitted to the Service.

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/EndangeredSpecies_Lists/EndangeredSpecies_Lists_Main.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 the 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 species occurring in the project county is not present in, or adjacent to, the action area). No coordination or conduct 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. The Federal agency or the designated non-Federal representative should seek written concurrence from the Service that adverse effects have been eliminated. Be sure to include all the information and documentation used to reach your decision with your concurrence. The Service must have this documentation before issuing a concurrence.

Is likely to adversely affect – adverse effect 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 likely to cause some adverse effect to individuals or that species, then the proposed action "is likely to adversely affect" the listed species. An "is likely to adversely affect" determination requires the Federal action agency to initiate 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 effect, the qualified personnel conducting the evaluation, habitat conditions, site photographs, and any other related articles. The Service's Consultation Handbook is available online to assist you with further information on definitions, process, and fulfilling Endangered Species Act requirements for your projects at http://www.fws.gov/endangered/esa-library/index.html.

If we can further assist you in understanding a federal agency's obligations under the Endangered Species Act, please contact Tanya Sommer at 512-490-0057, extension 222.

Sincerely,

Adam Zerrenner
Field Supervisor

Appendix B

Public Involvement Information

September 25, 2013

Valued CPS Energy Customer:

CPS Energy would like to invite you to attend an open house to learn about an upcoming project that will improve the electric service reliability in your area. The Bulverde Substation project consists of building a new substation, transmission line and associated distribution lines north of San Antonio near US 281 and FM 1863. The new substation will require approximately 5 acres of property and a transmission line that will connect to the existing Stonegate-Green Mountain Transmission Line. We propose to start construction in mid 2016.

At the open house we will inform customers of our plans for the substation. We welcome your questions, comments and concerns regarding this project. CPS Energy team members directly involved with this project will be present to answer your questions. This event will have an informal "come and go" type format consisting of information stations addressing specific areas of the project. Attendees are encouraged to review each station at their own pace and ask questions.

CPS Energy Open House
Bulverde Substation Project
5:30pm-7:30pm October 15, 2013
St. Paul Lutheran Church
29797 US 281, Bulverde, Texas 78163

Included in this packet is a brochure describing the project and a map showing the location of potential sites for both the substation and routes for the transmission line. Additional information is also available at www.cpsenergy.com search: Bulverde.

I look forward to meeting you and answering your questions. Thank you in advance for taking the time to join us and provide us with your feedback.

Sincerely,

Cathleen Ballard

Project Manager

145 Navarro P.O. Box 1771 San Antonio, Texas 78296

25 de septiembre 2013

Estimado cliente de CPS Energy

CPS Energy le invita a asistir a una recepción abierta al público para conocer más acerca de un futuro proyecto que mejorará la confiabilidad de suministro eléctrico en su área. El proyecto de la Subestación de Bulverde consiste en construir una subestación nueva, línea de transmisión y las respectivas líneas de distribución al norte de San Antonio cerca de la US 281 y FM 1863. La nueva subestación requerirá aproximadamente 5 acres de terreno y una línea de transmisión a la actual línea Stonegate-Green Mountain Transmission Line. Proponemos comenzar dicha construcción a mediados del 2016.

En la recepción abierta al público explicaremos nuestros planes para la subestación y queremos saber sus opiniones y sugerencias en cuanto a este proyecto. Los miembros del equipo de CPS Energy a cargo de construir la subestación y líneas de transmisión y distribución estarán presentes para presentarse y responderle a sus preguntas. Este evento será de tipo informal y los asistentes podrán ir y venir a su gusto y conveniencia. El evento contará con estaciones de información dedicadas a áreas específicas del proyecto. Les urgimos a los asistentes que visiten cada estación a su gusto y hacer preguntas con confianza.

CPS Energy Open House
Bulverde Substation Project
5:30pm-7:30pm octubre 15, 2013
St. Paul Lutheran Church
29797 US 281, Bulverde, Texas 78163

Incluidos en este paquete están: un folleto en el cual se describe el proyecto y un mapa que demuestra la ubicación de los posibles sitios para la subestación y las líneas de distribución y transmisión. Para información adicional por favor visite www.cpsenergy.com (palabra clave: Bulverde)

Me dará mucho gusto conocerlos y responder a sus preguntas. Gracias de antemano por tomar el tiempo de asistir y brindarnos sus comentarios.

Atentamente,
Cathleen Ballard
Gerente de proyecto

Who is CPS Energy?

CPS Energy is the nation's largest municipally owned natural gas and electric company, providing service to 741,000 electric and 331,000 natural gas customers in the Greater San Antonio area. The company offers the lowest rates among the top 10 largest U.S. cities, while ranking number one in wind-energy capacity among municipally owned energy systems and number one in Texas for solar generation.

CPS Energy's goal is to provide reliable energy in an environmentally responsible way. This brochure is a first step in notifying the public of this project in an effort to work together to achieve that goal. If outages are necessary or the scope of the project changes, the public will be notified via letter and/or door hanger. If you have any questions regarding the project please contact Cathleen Ballard.

How can you follow the progress of this project?

The CPS Energy project team will post project information on the CPS Energy website at www.cpsenergy.com.

(search: Bulverde)

Who can answer your questions?

The website will include regular updates on the project as steps are completed. Also, you may call, write or e-mail to:

CPS Energy

Cathleen Ballard, Project Manager

Bulverde Substation Project

Mail Code 111008

P.O. Box 1771

San Antonio, Texas 78296-1771

(210) 353-2890

CCBallard@cpsenergy.com

CPS ENERGY works for you

CPS ENERGY works for you

BULVERDE SUBSTATION PROJECT

INFORMATION ABOUT THE BULVERDE SUBSTATION PROJECT

What is the Bulverde Substation Project?

CPS Energy plans to construct a new electric substation in the north central area of San Antonio, near US 281 and FM 1863.

A substation is a local power hub or distribution point for electricity. This substation will provide additional electric capacity to support community growth. The new substation will require a new transmission line to connect with the existing transmission grid. The substation will supply electric power to homes and businesses in the immediate area, largely using existing lower-voltage distribution lines.

The substation requires approximately 5 acres.

We propose to start construction in mid 2016.

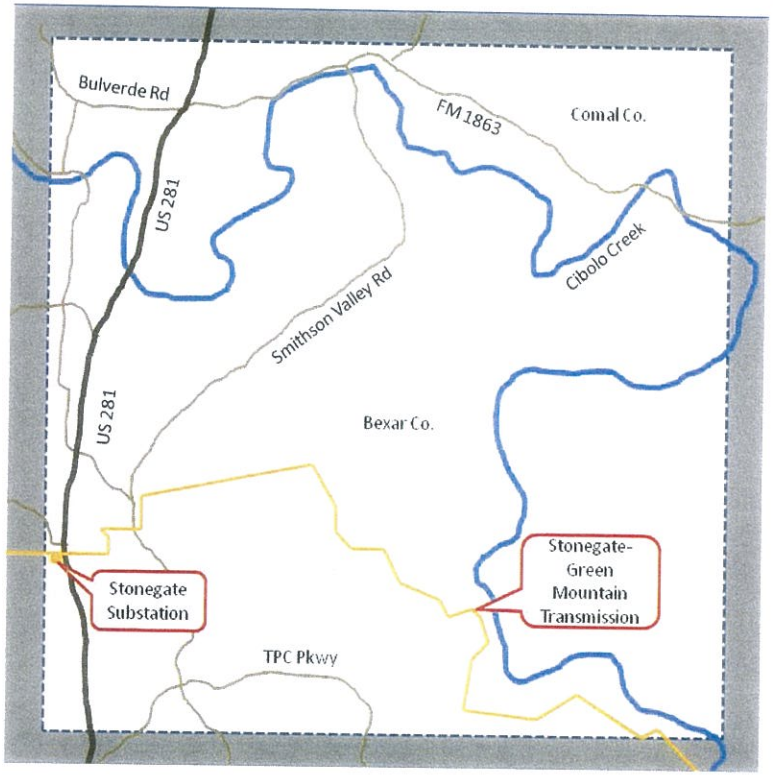
Why is this project needed?

The existing CPS Energy electric system in north central San Antonio must be expanded to serve customers' needs for reliable electric power. The demand for electricity is increasing in the US 281-FM 1863 area, and we have an opportunity to improve the reliability of electric service to our customers for today and into the future.

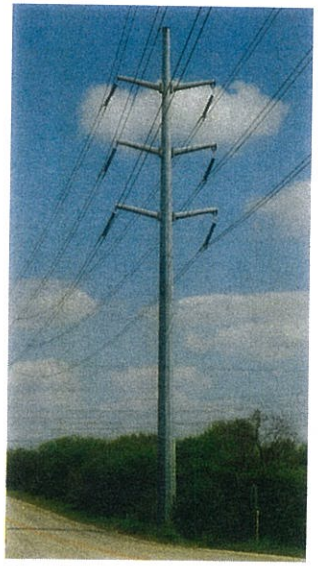
How might this project affect you?

When a proposed site is identified, CPS Energy will contact individual landowners regarding acquisition of property for the substation and easements for power lines entering and exiting the substation. In addition, we will strive to minimize disruptions to landowners and their properties.

Typical Substation



Study Area



Typical Transmission Line

Typical Distribution Line

¿Quién es CPS Energy?

CPS Energy es la empresa de luz y gas natural de propiedad municipal más grande de la nación, suministrando servicio a 741,000 clientes de luz eléctrica y 331,000 clientes de gas natural en el área de San Antonio y sus alrededores. La empresa cuenta con las tarifas más bajas de las 10 ciudades más grandes en los EE UU y mantiene el primer lugar en energía eólica entre los sistemas energéticos de propiedad municipal y el primer lugar en Texas de generación solar.

La meta de CPS Energy es proporcionar energía confiable de manera responsable hacia el medioambiente. Este folleto es el primer paso en notificar al público de este proyecto para poder trabajar juntos para lograr esta meta. Si cortes a la energía o el enfoque del proyecto cambia, se le informaría al público de tales cambios por medio de una carta y/o un volante en la perilla de su puerta o reja. Si tiene alguna duda o pregunta, por favor contacte a Cathleen Ballard.

¿Cómo puede Usted mantenerse al corriente del progreso de este proyecto?

El equipo de CPS Energy a cargo de este proyecto hará disponible toda la información relacionada con este proyecto en la página web de CPS Energy en la siguiente dirección: www.cpsenergy.com

(busque: Bulverde)

¿Quién puede contestarle sus preguntas?

La página web regularmente incluirá las actualizaciones acerca del proyecto a medida que se finalicen las diversas etapas. Adicionalmente, Usted puede llamar, escribir o mandarnos un mensaje electrónico a:

CPS ENERGY

Cathleen Ballard, Gerente del Proyecto

Bulverde Substation Project

Código de Correo 111008

P.O. Box 1771

San Antonio, Texas 78296-1771

(210) 353-2890

CCBallard@cpsenergy.com

CPS ENERGY works for you

CPS ENERGY works for you

PROYECTO de la SUBESTACIÓN DE BULVERDE

INFORMACIÓN ACERCA DE LA SUBESTACIÓN DE BULVERDE

¿Qué es el Proyecto de la Subestación de Bulverde?

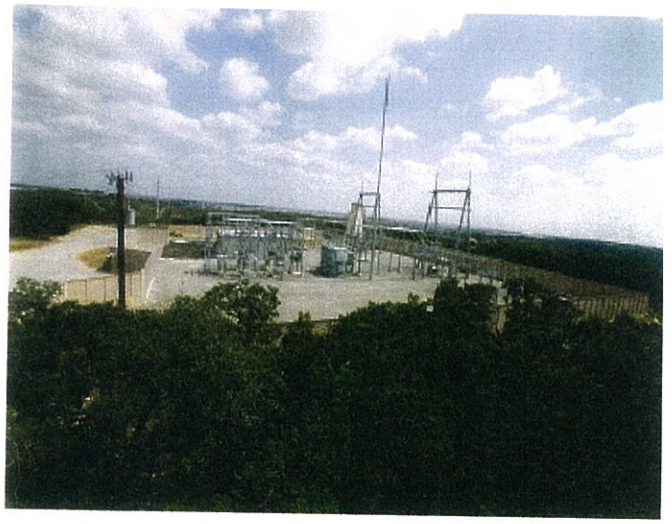
CPS Energy tiene planeado construir una nueva subestación eléctrica en el área norte-central de San Antonio, cerca de US 281 y FM 1863.
Una subestación es un punto de concentración local para la electricidad. Esta subestación proporcionará capacidad eléctrica adicional para apoyar el crecimiento de nuestra comunidad. La nueva subestación requerirá una línea nueva de transmisión que se conecte con la actual red eléctrica. La subestación suministrará la corriente eléctrica por igual a residencias y negocios en el área inmediata, generalmente por medio de líneas de distribución de bajo voltaje.
La subestación requiere aproximadamente 5 acres de terreno.
Proponemos comenzar la construcción a mediados del 2016.

¿Por qué es necesario este proyecto?

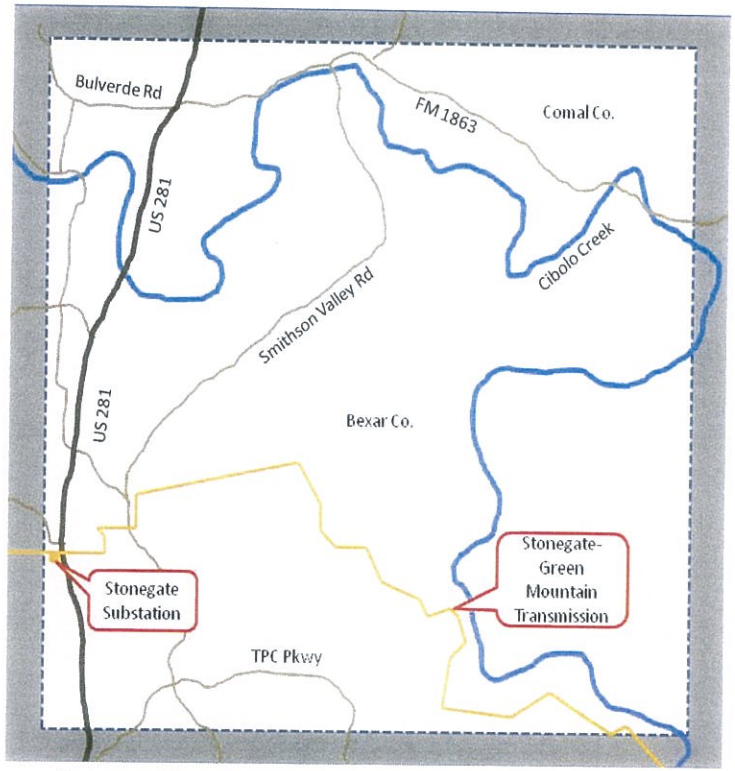
El sistema eléctrico actual de CPS Energy en al área norte-central de San Antonio requiere una marcada expansión para cumplir con las necesidades de nuestros clientes en cuanto a la corriente eléctrica confiable. La necesidad de electricidad está incrementando en el área de US 281-FM 1863 y tenemos ahora la oportunidad de mejorar la confiabilidad del servicio de electricidad para nuestros clientes tanto hoy como en el futuro.

¿Cómo puede afectarle a usted este proyecto?

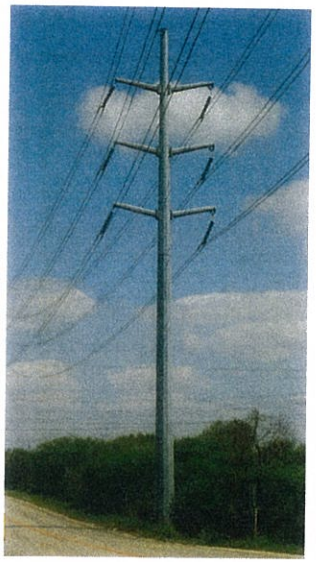
Al identificarse un sitio potencial CPS Energy se pondrá en contacto con los propietarios particulares referente a la adquisición del terreno para la subestación y las servidumbres para las líneas de corriente que entrarían y saldrían de dicha subestación. Adicionalmente, procederemos con esmero para minimizar las interrupciones a los propietarios y sus respectivos terrenos.



Una Subestación Típica



Área de Estudio



Una Línea de Transmisión Típica

Una Línea de Distribución Típica

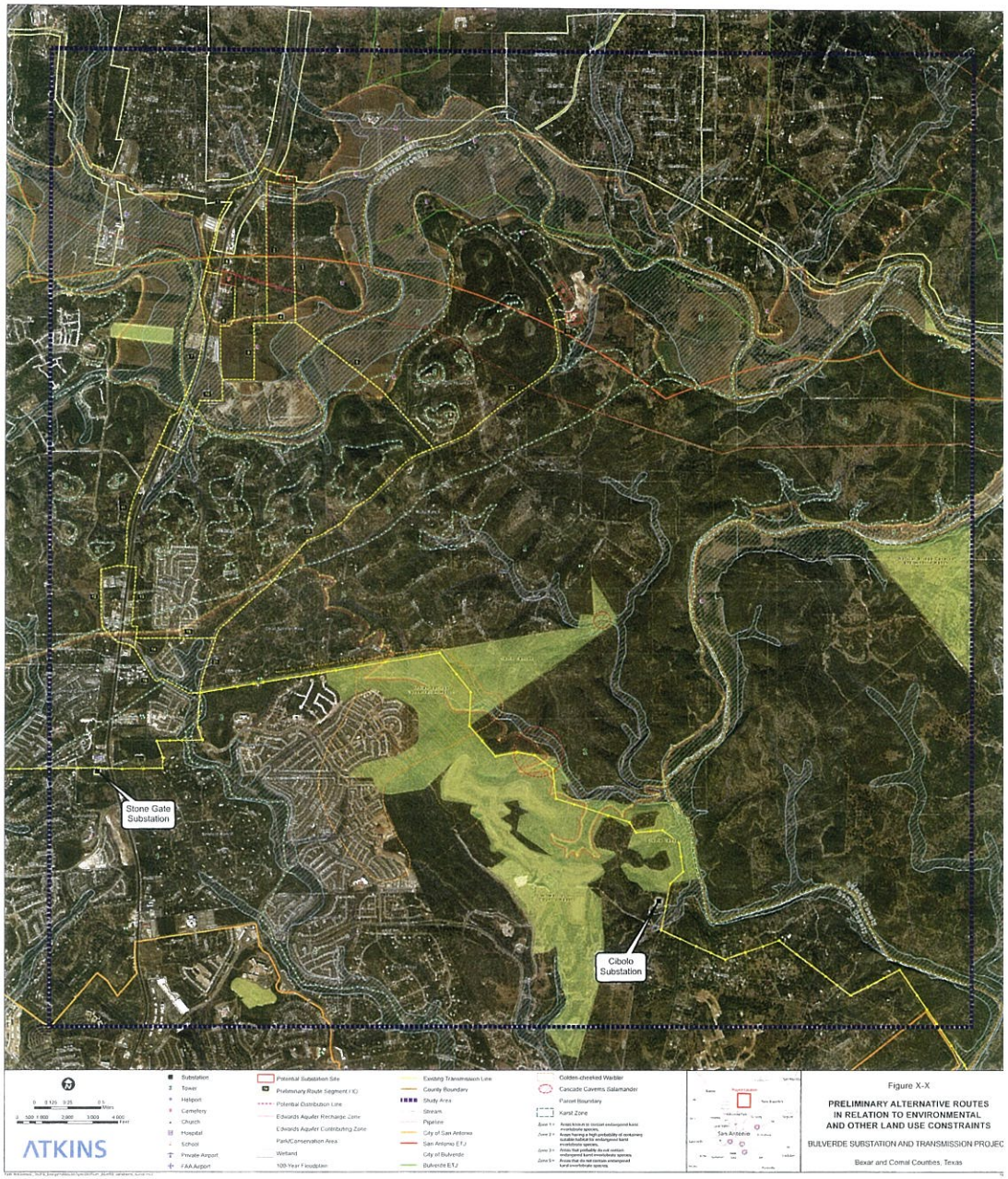
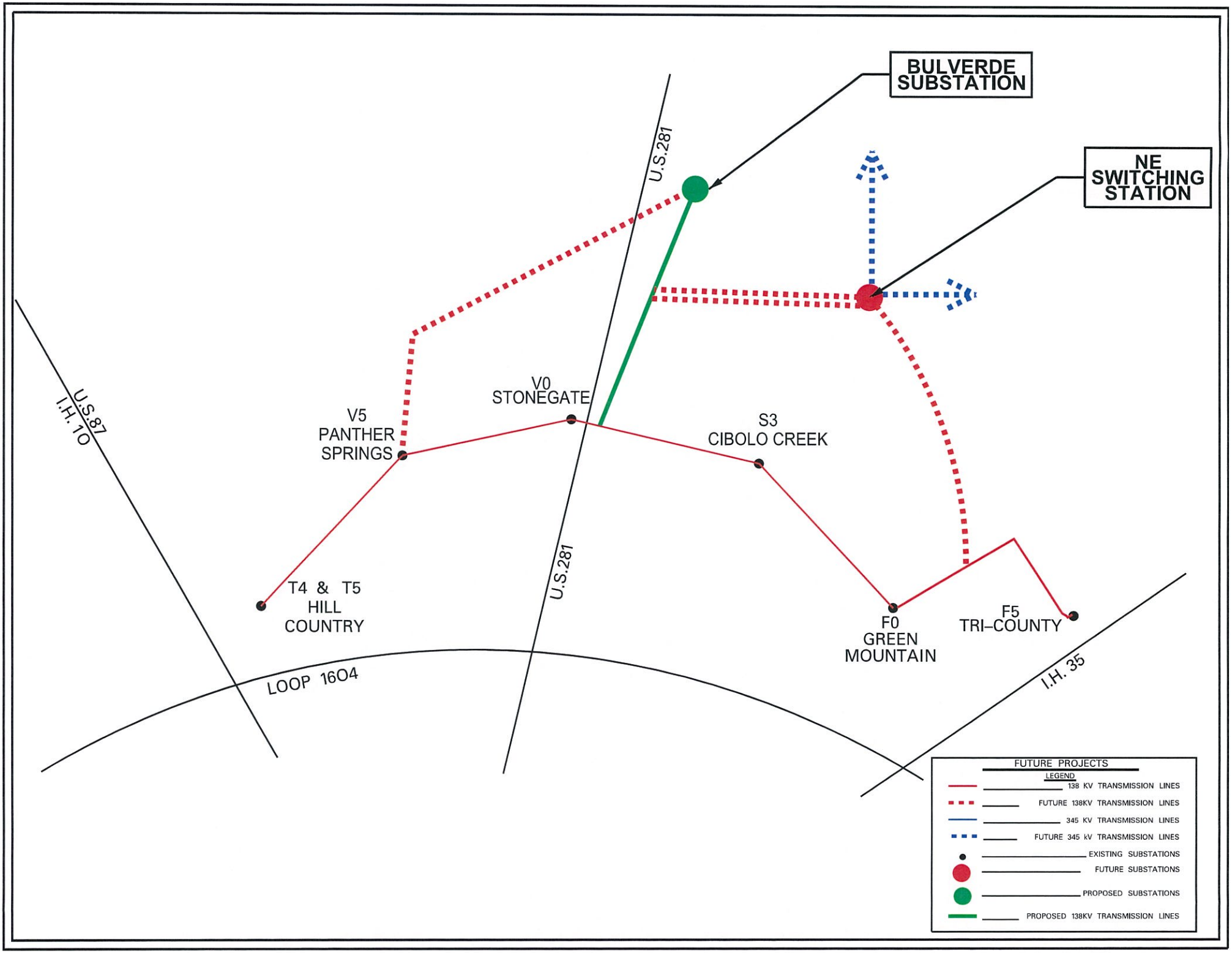


Figure X-X

PRELIMINARY ALTERNATIVE ROUTES IN RELATION TO ENVIRONMENTAL AND OTHER LAND USE CONSTRAINTS

BULVERDE SUBSTATION AND TRANSMISSION PROJECT

Bexar and Comal Counties, Texas


BULVERDE SUBSTATION
NE SWITCHING STATION
U.S.281
U.S.87
I.H. 10
V0
STONEGATE
V5
PANTHER
SPRINGS
S3
CIBOLO CREEK
T4 & T5
HILL
COUNTRY
U.S.281
F0
GREEN
MOUNTAIN
F5
TRI-COUNTY
LOOP 1604
I.H. 35
FUTURE PROJECTS
LEGEND
138 KV TRANSMISSION LINES
FUTURE 138KV TRANSMISSION LINES
345 KV TRANSMISSION LINES
FUTURE 345 kV TRANSMISSION LINES
EXISTING SUBSTATIONS
FUTURE SUBSTATIONS
PROPOSED SUBSTATIONS
PROPOSED 138KV TRANSMISSION LINES

CPS FACILITY GENERAL ROUTING/SITING PROCESS

1. **Utility Planners/Engineers determine/establish need for project**
   - Transmission line voltage needs
   - Substation needs
2. **Study Area delineated based on end points for transmission line and/or electrical load area for substation**
   - Study area large enough to allow flexibility in transmission line routing/substation location
3. **Data Gathering Phase and Development of Constraints Map**
   - Letters sent to federal, state, and local agencies requesting information/concerns about study area
   - Aerial photographs of study area obtained
   - Information regarding sensitive/important natural, cultural, human resources mapped as constraints
   - Property boundary information obtained (not land ownership)
4. **Preliminary alternative transmission line routes/substation sites developed, considering:**
   - Environmental/land use constraints or avoidance/exclusion areas
   - Routing/siting opportunities
   - Engineering/right-of-way concerns
   - Evaluation of structure types
5. **Public Involvement Program**
   - Landowner and interested party notification and newspaper notices for public meetings
   - Public Open House meetings held to explain need for the project and to solicit input on preliminary alternative routes/sites
6. **Alternatives refined**
   - Public and agency input evaluated and used to modify alternative routes, if appropriate
7. **Additional public meetings**
   - Review revised routes with public, if necessary
8. **Primary alternative routes/sites evaluated using list of environmental criteria**
   - 25-35 environmental/land use criteria used to evaluate/compare alternatives
9. **Preferred route/site recommended**
   - Based on environmental/land use factors
   - One or more viable alternatives identified
10. **Environmental assessment report prepared, including discussion of:**
    - Purpose and need for project
    - Description of proposed design and construction
    - Existing environment
    - Alternative analysis
    - Public/Agency input
    - Impacts of each alternative
    - Local/state/federal permitting requirements
    - Mitigation (if necessary)
    - Costs for each alternative
11. **Utility selects overall preferred route based on factors such as:**
    - Public input
    - Engineering
    - Cost
    - Right-of-way considerations
    - Maintenance
    - Environmental
    - Land Use
12. **Public notified of final route/site selected and date for start of construction.**

CPS ENERGY ATKINS

CPS ENERGY
BULVERDE PROJECT
QUESTIONNAIRE

Please respond to the following questions so we can evaluate public interest in this project.

1. Has the need for the project been adequately explained to you? _____ Yes _____ No

2. What factors do you believe should be considered (avoided if possible) in the siting of this substation and transmission line? (If you have multiple concerns, please rank them 1st, 2nd, 3rd, etc.)

Proximity to:

Residential areas	_____	Commercial/industrial areas	_____
Floodplains/wetlands	_____	Wildlife habitat/woodlands	_____
Recreational/park areas	_____	Schools	_____
Archaeological/historic sites	_____	Churches/cemeteries	_____

3. What other factors do you believe should be considered? (Continue on back if necessary.)

_____

_____

4. Please identify the substation site options and route segment options (by number) that you believe will have significant impact on people or the natural environment and describe why/how. (Continue on back if necessary.)

_____

_____

_____

5. How did you learn about this Public Open House Meeting?

_____

6. Do you have any additional comments or questions? (Continue on back if necessary.)

_____

_____

_____

7. Would you like someone to follow-up with you to discuss the project in more detail?
_____ No _____ Yes (Please provide contact information below.)

Optional:
Name _____
Address _____
City, State/ZIP _____
Daytime phone _____
E-mail _____

Please turn in your completed questionnaire at this meeting or mail within three days to:

Cathleen Ballard, Project Manager
CPS Energy, Mail Drop 111008
P.O. Box 1771
San Antonio, Texas 78296-1771

THANK YOU FOR YOUR COMMENTS

CPS ENERGY
CUESTIONARIO ACERCA DEL
PROYECTO BULVERDE

Por favor responda a las siguientes preguntas para que así podamos evaluar el nivel de interés público en este proyecto.

1. ¿Se le ha explicado de manera adecuada la necesidad para este proyecto?
   _____ Sí _____ No

2. ¿Cuales factores piensa Usted que se deben considerar (o evitar si es posible) en cuanto a la ubicación de esta subestación y línea de transmisión? (Si tiene múltiples preocupaciones, por favor apúntelas según su importancia de mayor a menor (1era, 2nda, 3era, etc.)

La proximidad a:

Áreas residenciales	_____	Áreas comerciales/industriales	_____
Áreas de inundación/pantanos	_____	Hábitat de fauna silvestre/ bosques	_____
Áreas de recreación/parques	_____	Escuelas	_____
Áreas arqueológicas/sitios históricos	_____	Iglesias/ cementerios	_____

3. ¿Cuales otros factores piensa Usted se deben considerar? (Continúe al reverso de esta hoja si es necesario.)
_____
_____

4. Identifique por favor las opciones para la ubicación de la subestación y las opciones para los segmentos de enrutamiento (por número) que Usted piensa impactarían a los habitantes o el medio ambiente natural y describa cómo y por qué. (Continúe al reverso de esta hoja si es necesario.)
_____
_____

5. ¿Cómo supo de esta recepción abierta al público?
_____

6. ¿Tiene algún comentario o sugerencia adicional? (Continúe al reverso de esta hoja si es necesario.)
_____
_____
_____

7. ¿Quisiera que alguien de nuestro equipo le contacte para conversar a más profundidad acerca de este proyecto?
_____No _____Sí (Por favor proporcione sus datos enseguida.)

Opcional:
Nombre _____
Dirección _____
Ciudad, Estado/Código Postal_____
Número Telefónico Hábil_____
E-mail_____

Por favor llene y entregue este cuestionario en la sesión abierta al público o envíelo por correo a no más de tres días a:

Cathleen Ballard, Project Manager
CPS Energy, Mail Drop 111008
P.O. Box 1771
San Antonio, Texas 78296-1771

GRACIAS POR SUS COMENTARIOS

Stone Gate Substation

Cibolo Substation

Stonegate - Green Mountain 138 kV Line

Comal County
Bexar County

Bulverde Hills
Saddlerdge
Oak Village North
Rim Rock Ranch
Verde Mountain
Country Place
Riata Ranch
Trinity Oaks
Clear Springs Park
Lookout Canyon
Indian Springs
Indian Springs Conservation Assoc.
Cibolo Canyon
Natural Bridge Caverns and Wildlife Ranch
Summerglen
Sendero Ranch
Bulverde Village
Cibolo Canyons
J.W. Marriot Hill Country Resort
Fossil Ridge

0 0.125 0.25 0.5 Miles

0 500 1,000 2,000 3,000 4,000 Feet

ATKINS

- Substation
- Tower
- Heliport
- Cemetery
- Church
- Hospital
- School
- Private Airport
- FAA Airport
- Potential Substation Site
- Preliminary Route Segment / ID
- Potential Distribution Line
- Edwards Aquifer Recharge Zone
- Edwards Aquifer Contributing Zone
- Park/Conservation Area
- Wetland
- 100-Year Floodplain
- Existing Transmission Line
- County Boundary
- Study Area
- Stream
- Pipeline
- City of San Antonio
- San Antonio ETJ
- City of Bulverde
- Bulverde ETJ
- Golden-cheeked Warbler
- Cascade Caverns Salamander
- Parcel Boundary
- Karst Zone

Zone 1 = Areas known to contain endangered karst invertebrate species.
Zone 2 = Areas having a high probability of containing suitable habitat for endangered karst invertebrate species.
Zone 3 = Areas that probably do not contain endangered karst invertebrate species.
Zone 5 = Areas that do not contain endangered karst invertebrate species.

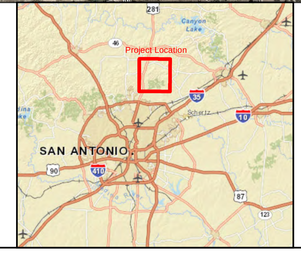


Figure 2-1

PRELIMINARY ALTERNATIVE ROUTES IN RELATION TO ENVIRONMENTAL AND OTHER LAND USE CONSTRAINTS

BULVERDE SUBSTATION AND TRANSMISSION PROJECT

Bexar and Comal Counties, Texas

Path: N:\Clients\C_D\CPS_Energy\100032882\geo\DISPLAY_BOARD_constraints_42inch.mxd

12/2/2013

Route Combinations:

A1	1-7-11-12-16	B1	6-7-11-12-16
A2	1-7-11-13-14-16	B2	6-7-11-13-14-16
A3	1-7-11-13-15-21	B3	6-7-11-13-15-21
A4	3-4-9-10-11-12-16	B4	8-10-11-12-16
A5	3-4-9-10-11-13-14-16	B5	8-10-11-13-14-16
A6	3-4-9-10-11-13-15-21	B6	8-10-11-13-15-21
A7	3-5-20-21	B7	6-7-11-12-14-15-21
A8	1-7-11-12-14-15-21	B8	8-10-11-12-14-15-21
A9	3-4-9-10-11-12-14-15-21	C1	17-19-20-21

0 1,500 3,000 4,500 Feet

ATKINS

- Substation
- Tower
- Heliport
- Cemetery
- Church
- Hospital
- School
- Private Airport
- FAA Airport
- Potential Substation Site
- Route Segment ID
- End Point of Deleted/Rerouted Segment
- Edwards Aquifer Recharge Zone
- Edwards Aquifer Contributing Zone
- Pipeline
- Wetland
- 100-Year Floodplain
- Existing Transmission Line
- County Boundary
- Study Area
- Stream
- City of San Antonio
- San Antonio ETJ
- City of Bulverde
- Bulverde ETJ
- Park/Conservation Area
- Golden-cheeked Warbler
- Cascade Caverns Salamander
- Parcel Boundary
- Karst Zone
- Zone 1 = Areas known to contain endangered karst invertebrate species.
- Zone 2 = Areas having a high probability of containing suitable habitat for endangered karst invertebrate species.
- Zone 3 = Areas that probably do not contain endangered karst invertebrate species.
- Zone 5 = Areas that do not contain endangered karst invertebrate species.

Figure 2-2

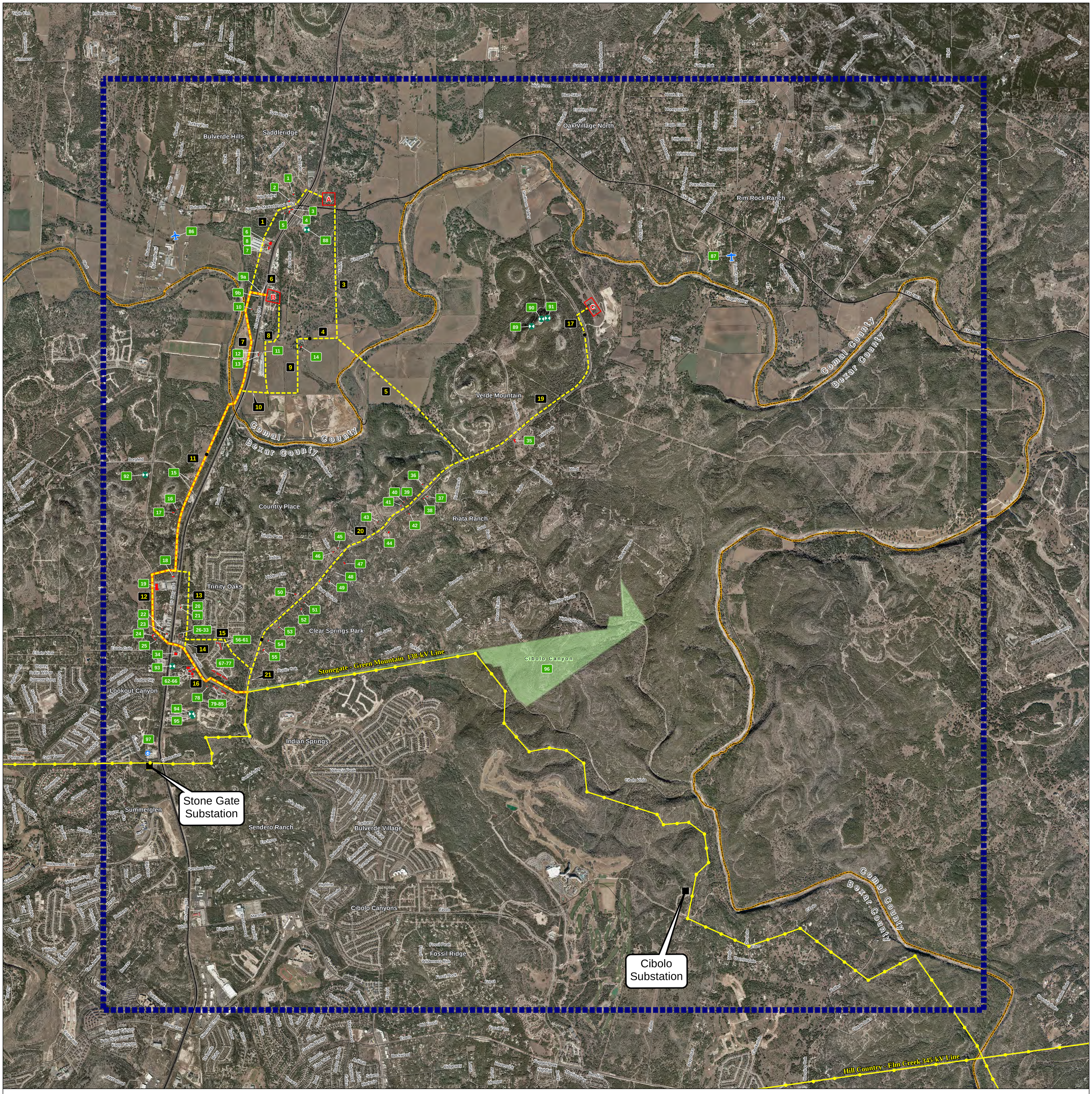
PRIMARY ALTERNATIVE ROUTES AND SUBSTATION SITES

BULVERDE SUBSTATION AND TRANSMISSION PROJECT

Bexar and Comal Counties, Texas

Path: N:\Clients\C_D\CPS_Energy\100032882\geo\primary_constraints_figure_2_2.mxd

12/4/2013



Substation
Potential Substation Site
End Point of Deleted/Rerouted Segment
Preferred Alternative Route
Primary Alternative Route
Route Segment ID
Study Area
County Boundary
Existing Transmission Line

Habitable Structures/ Land Use Feature Label
Habitable Structure
Tower
Heliport
Private Airport
FAA Airport
Park/Conservation Area

	Route	Segment
Preferred:	B1	6-7-11-12-16

	Route	Segment	Route	Segment
Alternate:	A1	1-7-11-12-16	B2	6-7-11-13-14-16
	A2	1-7-11-13-14-16	B3	6-7-11-13-15-21
	A3	1-7-11-13-15-21	B4	8-10-11-12-16
	A4	3-4-9-10-11-12-16	B5	8-10-11-13-14-16
	A5	3-4-9-10-11-13-14-16	B6	8-10-11-13-15-21
	A6	3-4-9-10-11-13-15-21	B7	6-7-11-12-14-15-21
	A7	3-5-20-21	B8	8-10-11-12-14-15-21
	A8	1-7-11-12-14-15-21	C1	17-19-20-21
	A9	3-4-9-10-11-12-14-15-21		

Figure 7-1

HABITABLE STRUCTURES AND OTHER LAND USE FEATURES IN THE VICINITY OF THE ROUTE RECOMMENDED BY CPS ENERGY STAFF AND ALTERNATE ROUTES

BULVERDE SUBSTATION
AND TRANSMISSION PROJECT

Bexar and Comal Counties, Texas

Path: N:\Clients\C_D\CPS_Energy\100032882\geo\land_use_figure_7_1.mxd

12/4/2013