

GUADALUPE GENERATING STATION

BIOLOGICAL ASSESSMENT OF EFFECTS ON FEDERALLY PROTECTED SPECIES

Prepared for:

GUADALUPE POWER PARTNERS LP Marion, Texas

Prepared by:



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TABLE OF CONTENTS

| Section | | | <u>Page</u> |
|---------|------------------|--|-------------|
| EXEC | UTIVE SUMMA | ARY | ES-1 |
| 1.0 | INTRODUC | TION | 1-1 |
| 2.0 | PROJECT S | ITE | 2-1 |
| | 2.1 <u>DESC</u> | <u>RIPTION</u> | 2-1 |
| 2.0 | CONSTRUC | TTION IMPACTS | 2-1 |
| 5.0 | CONSTRUC | TION IMPACTS | 3-1 |
| | 3.1 <u>NOISE</u> | E IMPACTS | 3-2 |
| | 3.2 <u>LINEA</u> | AR FACILITIES | 3-2 |
| 4.0 | OPERATIO | N IMPACTS | 4-1 |
| | 4.1 <u>WAST</u> | TEWATER AND STORMWATER IMPACTS | 4-1 |
| | 4.2 <u>NOISE</u> | <u>E IMPACTS</u> | 4-3 |
| | 4.3 <u>LINEA</u> | AR FACILITIES | 4-3 |
| | 4.4 <u>AIR Q</u> | UALITY MODELING RESULTS | 4-3 |
| | 4.5 <u>DEFIN</u> | <u>VITION OF ACTION AREA</u> | 4-7 |
| | 4.6 <u>ASSES</u> | SSMENT OF IMPACTS IN THE ACTION AREA | 4-8 |
| 5.0 | FEDERALL | Y LISTED SPECIES | 5-1 |
| | 5.1 <u>PROT</u> | ECTED SPECIES REGULATIONS | 5-1 |
| | 5.2 <u>FEDE</u> | RALLY LISTED SPECIES ASSESSMENT | 5-2 |
| | 5.2.1 | INTERIOR LEAST TERN (Sterna antillarum athalassos) | 5-2 |
| | 5.2.2 | SPRAGUE'S PIPIT (Anthus spragueii) | 5-4 |
| | 5.2.3 | WHOOPING CRANE (Grus americana) | 5-5 |
| | 5.2.4 | BLACK-CAPPED VIREO (Vireo atricapilla) | 5-7 |
| | 5.2.5 | chrysonaria) | 5-7 |
| | 526 | RED WOLF (Canis rufus) | 5-8 |
| | 5.2.7 | LOUISIANA BLACK BEAR (Ursus americanus) | 5-8 |
| | 5.2.8 | JAGUARUNDI (Herpailurus vaguarondi) | 5-9 |
| | 5.2.9 | BRACTED TWISTFLOWER (Streptanthus bracteatus) | 5-10 |
| | 5.2.10 | WATER-DEPENDENT SPECIES: FISH, MOLLUSKS, | |
| | | CRUSTACEANS, AND INSECTS | 5-10 |
| 6.0 | CONCLUSI | ON | 6-1 |

APPENDICES

APPENDIX A—GGS SITE ACTION AREA PHOTOGRAPHS APPENDIX B—OFFSITE ACTION AREA PHOTOGRAPHS

LIST OF TABLES

| <u>Table</u> | | Page |
|--------------|---|------|
| 1 | Wildlife Species Identified as Making Use of Land Proposed for the GGS Expansion | 2-3 |
| 2 | GGS Project Air Pollutant Emissions | 4-2 |
| 3 | Results of Air Quality Modeling | 4-5 |
| 4 | Federally Listed Species Occurring in Guadalupe and Comal Counties, Texas | 5-3 |
| 5 | Effect of Construction and Operation of Proposed Simple-Cycle CTs on Federally Listed Species in Guadalupe and Comel | |
| | Counties, Texas | 6-2 |

LIST OF FIGURES

| <u>Figure</u> | | <u>Page</u> |
|---------------|---|-------------|
| 1 | Project Site Location Map | 1-2 |
| 2 | Project Site Layout | 1-5 |
| 3 | Action Area in Relation to Project Site Location | 4-6 |
| 4 | Whooping Crane Locations and Migratory Paths in Relation to Action Area | 5-6 |

LIST OF ACRONYMS AND ABBREVIATIONS

| $\mu g/m^3$ | microgram per cubic meter |
|-------------------|--|
| AWBP | Aransas-wood buffalo population |
| CFR | Code of Federal Regulations |
| CO | carbon monoxide |
| CO ₂ e | carbon dioxide equivalent |
| СТ | combustion turbine |
| EPA | U.S. Environmental Protection Agency |
| ESA | Endangered Species Act of 1973 |
| ft | foot |
| GE | General Electric |
| GGS | Guadalupe Generating Station |
| GHG | greenhouse gas |
| GPP | Guadalupe Power Partners, LP |
| gr S/100 scf | grain of total sulfur per 100 standard cubic feet |
| H_2SO_4 | sulfuric acid |
| hr/yr | hour per year |
| km | kilometer |
| MW | megawatt |
| NAAQS | national ambient air quality standard |
| NMFS | National Marine Fisheries Service |
| NO_2 | nitrogen dioxide |
| NO _x | nitrogen oxides |
| PM ₁₀ | particulate matter less than or equal to 10 micrometers |
| PM _{2.5} | particulate matter less than or equal to 2.5 micrometers |
| PSD | prevention of significant deterioration |
| SER | significant emissions rate |
| SIL | significant impact level |
| TCEQ | Texas Commission on Environmental Quality |
| TPWD | Texas Parks and Wildlife Department |
| tpy | ton per year |
| TXNDD | Texas Natural Diversity Database |
| U.S.C. | United States Code |
| ULSD | ultra low-sulfur diesel |
| USFWS | U.S. Fish & Wildlife Service |
| USGS | U.S. Geological Survey |
| VOC | volatile organic compound |

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EXECUTIVE SUMMARY

Guadalupe Power Partners, LP (GPP), is proposing to construct two new simple-cycle combustion turbines (CTs) at the existing Guadalupe Generating Station (GGS) located in Marion, Guadalupe County, Texas. The existing GGS consists of four combined-cycle CTs and an auxiliary boiler all fired exclusively with natural gas, diesel fuel-fired internal combustion engines used for emergency electrical power and fire protection, a wet mechanical draft cooling tower, and a zero liquid discharge wastewater system.

Under Section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (Chapter 16, Section 1536, United States Code [U.S.C.]), the U.S. Environmental Protection Agency (EPA) must ensure that any action authorized, funded, or carried out by EPA is not likely to jeopardize the continued existence of any federally listed endangered or threatened species, including the destruction or adverse effects to such species' designated critical habitat. In addition, EPA must assess and implement requirements of other acts, including the Coastal Zone Management Act, National Historic Preservation Act, and Magnuson-Stevens Fishery Conservation and Management Act, if applicable.

This biological assessment (BA) was prepared to comply with the requirements under Section 7(a)(2) of the ESA (Chapter 16, Section 1536, U.S.C.). Chapter 50, Part 402.02, Code of Federal Regulations (CFR), defines an action area as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action." Therefore, this BA evaluates the effect of the construction and operation of the newly proposed simple-cycle CTs not only on the existing GGS property but also within an action area identified approximately 25 kilometers (km) northeast of the GGS site located in Comal County, Texas.

The potential effect to federally listed species from the construction and operation of the newly proposed simple-cycle CTs was evaluated. This BA concludes that the construction and operation of the newly proposed simple-cycle CTs will have no effect on federally listed species.

1.0 INTRODUCTION

Guadalupe Power Partners, LP (GPP), currently owns the Guadalupe Generating Station (GGS) located in Guadalupe County, approximately 6 kilometers (km) north of Marion and 45 km northeast of San Antonio (see Figure 1). GGS currently consists of four natural gas-fired, combined-cycle combustion turbines (CT) generator units capable of producing a nominal 1,000 megawatts (MW) of electricity. GGS is operated by NAES Corporation. GGS is currently a major stationary source of air emissions. This facility is permitted under Air Quality Permit No. 38659, PSD-TX-922, and Title V Operating Permit No. O-02071.

The proposed construction of two new simple-cycle CTs at the existing GGS will constitute a major modification as defined in 40 Code of Federal Regulations (CFR) Part 52.21(b)(2)(i), Prevention of Significant Deterioration of Air Quality. All regulated New Source Review (NSR) pollutants with emissions increases above the significant emission rates will be subject to PSD review. In addition to the existing regulated NSR pollutants, the U.S. Environmental Protection Agency (EPA) began regulating greenhouse gas (GHG) emissions under PSD preconstruction permitting and the Title V operation permitting programs effective January 2, 2011.

EPA issued the PSD and Title V GHG Tailoring Rule effective August 2, 2010, which "tailored" the PSD and Title V applicability thresholds specifically for GHG emissions. The Tailoring Rule used a two-step approach for determining PSD and Title V applicability for GHG emissions.

In Step 1, effective January 1, 2011, GHG is subject to PSD review if a stationary source:

- Is a new major stationary source for a non-GHG regulated NSR pollutant and will emit or have the potential to emit 75,000 tons per year (tpy) or more of carbon dioxide equivalent (CO₂e).
- Is an existing major stationary source for a non-GHG regulated NSR pollutant and will have an emissions increase of 75,000 tpy or more of CO₂e.



In Step 2, effective July 1, 2011, GHG is subject to PSD review if a stationary source:

- Will emit or have the potential to emit 100,000 tpy or more of CO_2e .
- Is an existing major stationary source for GHG emissions (i.e., existing GHG emissions are greater than 100,000 tpy) and has an emissions increase of 75,000 tpy or more of CO₂e.

On December 23, 2010, EPA Region 6 issued an open letter to permit holders and interested members of the public informing them that EPA Region 6 would be the GHG permitting authority in Texas beginning January 2, 2011. This was due to the "unwillingness of Texas state officials to implement" GHG emissions in their delegated PSD permitting program. Therefore, effective January 2, 2011, EPA Region 6 assumed the authority to issue PSD permits in Texas for GHG emissions, while the Texas Commission on Environmental Quality (TCEQ) retained the authority to issue PSD permits for all non-GHGregulated pollutants. EPA Region 6 will be handling the permit application process, including the application reviews, best available control technology determinations, permit ronstruction, and federal public notice and comment provisions for GHG PSD permits in Texas.

Under Section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (Chapter 16, Section 1536, United States Code [U.S.C.]), EPA must ensure that any action authorized, funded, or carried out by EPA is not likely to jeopardize the continued existence of any federally listed endangered or threatened species, including the destruction or adverse effects to such species' designated critical habitat. In addition, EPA must assess and implement requirements of other acts, including the Coastal Zone Management Act, National Historic Preservation Act, and Magnuson-Stevens Fishery Conservation and Management Act, if applicable.

GPP is proposing to construct two natural gas-fired simple-cycle CTs within the existing GGS property. These units will be identified as CTG-7 and CTG-8. Since GGS is an existing major stationary source of air emissions, emissions from the proposed simple-cycle CTs must be compared to the significant emissions rates (SERs) as defined in Chapter 40, Part 52.21(b)(23), Code of Federal Regulations (CFR). Potential emissions from the two

proposed natural gas-fired simple-cycle CTs will exceed the SERs for certain pollutants. Therefore, the addition of the two proposed natural gas-fired simple-cycle CTs will constitute a major modification as defined in 40 CFR 52.21(b)(2)(i).

The proposed modification to GGS will consist of the addition of two F-class CTs operating in simple-cycle mode. The CTs will be either General Electric (GE) 7FA.03, 7FA.04, or 7FA.05 or Siemens 5000F CTs. Emissions for all four CT models have been calculated based on a maximum of 2,500 hours per year (hr/yr) of operation per CT, including a maximum of 150 hr/yr for startup and shutdown operations. The maximum annual emissions will result if the Siemens 5000F CT model is selected. There will be one additional emergency firewater pump (FP-3), which will be associated with the new simple-cycle CT power block. There will be no additional auxiliary boilers, emergency generators, or cooling towers that will cause or contribute to air emissions. The CTs will be fired exclusively with pipeline-quality natural gas containing no more than 0.5 grain of total sulfur per 100 standard cubic feet (gr S/100 scf). The emergency firewater pump will be fired exclusively with ultra low-sulfur diesel (ULSD) fuel oil with a maximum sulfur content of 0.0015 percent by weight. Figure 2 depicts the site layout showing the four existing combined-cycle CTs, the two proposed simple-cycle CTs identified as CTG-7 and CTG-8, and FP-3.

GPP submitted a prevention of significant deterioration (PSD) air construction permit application to TCEQ on September 21, 2012, to install two new simple-cycle CTs to the existing GGS located in Marion, Guadalupe County, Texas. This PSD permit application addressed all pollutants subject to PSD review with the exception of GHG emissions. A draft PSD permit was issued by TCEQ on August 16, 2013, and the second public notice was published in the New Braunfels Herald Zeitung on August 23, 2013. TCEQ issued the final air preconstruction Permit Nos. 106011 and PSDTX1310 for GPP peaking plant on October 3, 2013.

GPP submitted a GHG PSD air construction permit application to EPA Region 6, on November 12, 2012. In support of the GHG PSD permit application, GPP also submitted a cultural resources report to EPA Region 6 on February 11, 2013. GPP is submitting this

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biological assessment (BA) to satisfy the requirements under Section 7(a)(2) of the ESA (Chapter 16, Section 1536, U.S.C.).

GGS is in the area of responsibility of the Austin, Texas, field office of the U.S. Fish & Wildlife Service (USFWS). As a result of correspondence with that office, USFWS indicated that an analysis to determine impacts to federally listed threatened and endangered species or their critical habitats should be submitted to and initially reviewed by EPA. EPA can then forward the document to USFWS for review, provided there is a finding of some impacts, i.e., USFWS does not wish to review a finding of "no effect." Therefore, GPP is submitting this BA of the proposed project and an evaluation of potential impacts to federally listed species that could be affected by the construction or operation of the project.

2.0 PROJECT SITE

2.1 DESCRIPTION

The GGS facility is located in Guadalupe County, approximately 6 km north of Marion and 45 km northeast of San Antonio in the Texas Blackland Prairie Ecoregion, specifically the Northern Blackland Prairie. According to the U.S. Geological Survey (USGS), the historical land cover of the Texas Blackland Prairies was predominantly tallgrass prairie, with forested areas occurring mostly along stream courses¹. Now most of the ecoregion had been converted to farmland, primarily cropland and some pastures. Some nonnative species now occur in pastures, including Johnson grass (*Sorghum halepense*), Bermuda grass (*Cynodon dactylon*), or king ranch bluestem (*Bothriochloa ischaemum*).The main crops grown are hay, corn, wheat, sorghum, cotton, pecans, and soybeans. Livestock production is primarily beef cattle. The GGS facility is bordered by mostly agricultural land uses.

The existing GGS facility, where additional construction is proposed, is being used as an active utility site. The GGS facility is fenced in and devoid of natural woody vegetation. The area proposed for additional construction is approximately 6.9 acres and is located north of the existing four natural gas-fired, combined-cycle CT generator units. The proposed site for the proposed two new simple-cycle CTs is currently being used primarily as cattle grazing land. A preliminary survey of the site indicated heavy cattle use, as evidenced by the prevalence of cattle manure, tracks, and the complete lack of any vegetation aside from recently grazed grasses and thorny shrubs, which are inedible to cattle (see Appendix A, Photographs 1 and 2).

2.2 ONSITE ECOLOGICAL SURVEY

On Tuesday, August 27, 2013, Mr. Bryan Delius, an ecologist with Environmental Consulting & Technology, Inc. (ECT), conducted a site survey of the existing GGS site. The onsite ecological survey was conducted during the morning commencing at approximately 8 a.m. The proposed site for the construction of the two proposed simple-cycle CTs at

¹ U.S. Geological Survey (USGS). 2013. Texas Blackland Prairies Ecoregion Summary. Accessed July 16. <<u>http://landcovertrends.usgs.gov/gp/eco32Report.html</u>>.

GGS is currently being used primarily as cattle grazing land. A preliminary survey of the site indicated heavy cattle use, as evidenced by the prevalence of cattle manure, tracks, and the complete lack of any vegetation aside from recently grazed grasses, including common carpetgrass (*Axonopus fissifolius*) and Bermuda grass, and thorny shrubs, mainly twisted acacia (*Acacia schaffneri*), which are inedible to cattle.

During the survey, the weather was overcast with a light rain and a slight breeze. The proposed expansion site was traversed in a meandering track in roughly east-west transects approximately 15 yards apart, until the whole of the proposed expansion site and approximately 30 yards beyond the approximate expansion site boundary were surveyed. Table 1 lists any observed wildlife species, or evidence thereof.

Digital photographs were taken to document the onsite action area and any evidence of wildlife when possible and are attached in Appendix A. Appendix B contains photographs depicting available views of the offsite action area from public property.

No species federally listed as threatened or endangered or candidate species to be potentially listed as threatened or endangered in Guadalupe County, Texas, by USFWS were either directly or indirectly (i.e., by means of evidence such as calls, scat, tracks, dens, burrows, nests, etc.) observed on the proposed expansion site of GGS.

| Common Name | Latin Name | Evidence | |
|---------------------------|----------------------|--------------------|--|
| Birds | | | |
| Barn swallow | Hirundo rustica | Fly over | |
| Common ground dove | Columbina passeerina | Direct observation | |
| Killdeer | Charadrius vociferus | Direct observation | |
| Mourning dove | Zenaida macroura | Direct observation | |
| Scissor-tailed flycatcher | Tyrannus forficatus | Direct observation | |
| Mammals | | | |
| Coyote | Canis latrans | Track | |
| Feral pig | Sus scrofa | Scat | |

Table 1. Wildlife Species Identified as Making Use of Land Proposed for the GGS Expansion

Source: ECT, 2013.

3.0 CONSTRUCTION IMPACTS

Construction of the two natural gas-fired simple-cycle CTs (CTG-7 and CTG-8) and the emergency firewater pump (FP-3) within the existing GGS facility would have had the potential to cause direct and indirect impacts if there were protected species habitats or individuals within the proposed construction footprint. Direct impacts include any physical disturbances associated with construction activities. Indirect impacts include noise, lighting, dust, erosion, sedimentation/turbidity, and air emissions.

Construction preparation and activities typically include land clearing, grading, installation of foundations or pilings, and construction and erection of the CTs and ancillary equipment. Construction equipment typically used for these activities includes diesel fuel-fired bulldozers, backhoes, pile drivers, cranes, and various dump trucks for delivery of gravel, sand, and other aggregate materials and removal of earth. Diesel fuel-fired electrical generators will be used during construction for providing electrical power to equipment and for lighting. The construction equipment will not operate simultaneously; that is, backhoes and bulldozers, which are primarily used for grading, are not used during the same time as cranes, which are primarily used during construction.

Construction is proposed to occur only on a small portion of the existing facility and entirely within the footprint of the existing fenced facility. Also, the construction laydown area will be located within the GSS facility boundary. Construction activities will be conducted primarily during the daytime between the hours of 7 a.m. and 7 p.m. Some construction activities that cannot be stopped and resumed may be performed during nighttime hours, but these activities will be minimal. Construction will commence immediately upon issuance and receipt of the final PSD permit for non-GHG pollutants from TCEQ and the final GHG PSD permit from EPA Region 6. Construction is scheduled for a 12- to 18-month time frame with a commercial operation date of June 2015. This is to ensure that peaking electrical power is available for the peak demand period during the summer of 2015.

3.1 NOISE IMPACTS

Noise during construction of the proposed simple-cycle CTs will be primarily due to the diesel engines used to power the mobile construction equipment such as bulldozers, backhoes, cranes, etc. Pile driving, if required, will only occur for a limited period of time during the construction phase. Noise during construction of the proposed simple-cycle CTs will be similar to construction noise generated from a commercial site such as a shopping center, office building, or church. Noise during construction will primarily be limited to daytime between the hours of 7 a.m. and 7 p.m. No adverse effects will result from the construction of the two proposed simple-cycle CTs.

3.2 LINEAR FACILITIES

The proposed two simple-cycle CTs will have minimal construction of new linear facilities located outside the existing GGS project site. A 150-foot (ft) transmission easement that parallels the current transmission corridor will be constructed alongside the current transmission corridor for approximately 0.25 mile to interconnect with the existing Marion substation. Vegetatively, this 0.25-mile corridor area is of the same character as the project site (see Section 2.2).

The GGS site already has an existing natural gas supply, which will be used to provide natural gas to the two proposed simple-cycle CTs. Since the two proposed CTs will be operated in simple-cycle mode, there is no cooling water required for the operation of these units so there will be no cooling water supply lines or cooling tower blowdown water lines. Water will be required for operation of the evaporative coolers, which are used to cool the CT inlet air prior to combustion. It is anticipated that this evaporative cooling water supply will be obtained from existing water pipeline to GGS.

In summary, based on the type of construction activities and equipment, the relatively short duration of the construction schedule, and the fact that no endangered or threatened species or their habitats have been identified onsite, no direct or indirect impacts are expected to occur due to the construction of the two proposed simple-cycle CTs.

4.0 OPERATION IMPACTS

Operation of CTG-7 and CTG-8 are expected to be minimal, due to limited operational hours (2,500 hr/yr per CT), which includes limited hours during startups and shutdowns. Since the addition of the proposed two simple-cycle CTs will occur at an existing electric generating facility that currently operates four combined-cycle CTs, any additional potential impacts due to increased lighting or noise due to the operation of the two proposed simple-cycle CTs are expected to be insignificant. FP-3 will only be operational for routine maintenance and testing and during actual emergencies when the CTs will not be operational.

Table 2 shows air pollutants that will be emitted by the proposed GGS project. As shown, five pollutants are projected to exceed the PSD SERs. Pollutants emitted at levels below the SERs are presumed to have minimal air quality impacts and are not subject to the PSD requirements.

Nitrogen oxides (NO_x), carbon monoxide (CO), particulate matter less than or equal to 10 micrometers (PM_{10}), and particulate matter less than or equal to 2.5 micrometers ($PM_{2.5}$) were assessed to predict the potential air quality impacts in relation to the National Ambient Air Quality Standards (NAAQS) and PSD increments from the operation of the facility. The primary NAAQS are protective of public health, and secondary NAAQS are protective of public health, and materials. GHG emissions do not have an NAAQS and are not considered practicable to assess GHG impacts on a local basis.

4.1 WASTEWATER AND STORMWATER IMPACTS

Once constructed, the proposed addition of two simple-cycle CTs will not require withdrawal of groundwater, nor will it have any direct discharges to groundwater. Additionally, the facility will have no discharges to surface water, and no infiltration of surface water contaminants will be expected. The GSS facility will continue to be a zero discharge facility after the establishment of the new CTs.

| Pollutant | Maximum Annual Emissions (tpy) | PSD SER (tpy) | PSD Applicability |
|-------------------------------------|--------------------------------------|------------------|-------------------|
| NO _x | 189.1 | 40 | Yes |
| СО | 238.9 | 100 | Yes |
| PM (filterable) | 12.3 | 25 | No |
| PM ₁₀ | 24.5 | 15 | Yes |
| PM _{2.5} | 24.5 | 10 | Yes |
| SO ₂ | 7.7 | 40 | No |
| Ozone/VOCs | 26.8 | 40 | No |
| GHG | 615,634 | 75,000 | Yes |
| Lead | 0.01 | 0.6 | No |
| H ₂ SO ₄ Mist | 0.5 | 7 | No |

Table 2. GGS Project Air Pollutant Emissions

Note: CO = carbon monoxide.

GHG = greenhouse gas.

 $H_2SO_4 =$ sulfuric acid.

 $NO_x = nitrogen oxides.$

PM = particulate matter.

 PM_{10} = particulate matter less than or equal to 10 micrometers.

 $PM_{2.5}$ = particulate matter less than or equal to 2.5 micrometers.

 $SO_2 = sulfur dioxide.$

VOC = volatile organic compound.

Source: ECT, 2013.

The handling and storage of fuels and other construction materials, along with wastes and byproducts, will occur in a manner that complies with applicable environmental regulations and prevents the release of untreated chemical constituents to the site soil, surface water, and groundwater resources.

4.2 NOISE IMPACTS

Noise emanating during operation of the two proposed simple-cycle CTs will be strictly due to the operation of the CTs. Cooling water is not required for simple-cycle CTs; therefore, there will be no cooling tower, mechanical draft fans, or recirculation water pumps. There is no auxiliary boiler associated with the operation of simple-cycle CTs.

The newly proposed simple-cycle CTs are only permitted to operate for 2,500 hr/yr per CT and will operate during periods of peak demand. During these periods of peak demand, the four existing combined-cycle CTs will also be in operation. The additional noise generated by the operation of the two proposed simple-cycle CTs will not cause or create a significant increase in perceivable noise levels Any potential noise impacts from the operation of the two newly proposed simple-cycle CTs, with limited hours of operation, are expected to be insignificant.

4.3 LINEAR FACILITIES

There will be no adverse effect or impact from the operation of any additional linear facilities required to tie natural gas supply or electrical power distribution in to the existing linear facilities at GGS.

In summary, no direct or indirect impacts are expected to occur due to the operation of the two proposed simple-cycle CTs.

4.4 AIR QUALITY MODELING RESULTS

Significant impact levels (SILs) for the various pollutants and averaging times have been developed under the PSD program to aid in the evaluation of pollutants. If a source is predicted to have impacts below the SIL, it is presumed to not be able to contribute significantly to a NAAQS violation or to an exceedance of a PSD air quality increment.

Regulatory modeling to satisfy the PSD requirements for NO_x, PM₁₀, PM_{2.5}, and CO was performed using the most recent EPA guideline model (i.e., AERMOD, Version 12345), and approved modeling methodology was performed for nitrogen dioxide (NO₂), CO, PM₁₀, and PM_{2.5}. Table 3 shows the NAAQS and TCEQ property line standards for SO₂ and sulfuric acid (H₂SO₄) mist. The primary and secondary NAAQS are the same for NO₂, PM₁₀, and PM_{2.5}. CO does not have secondary standards. Except for the NO₂ 1-hour averaging time, all predicted impacts were below the SILs. As well as the site for a new project, the SILs are also commonly used in biological assessments to define the "action" area, i.e., where the source may have the potential to adversely affect plants, animals, and soils.

Figure 3 illustrates the receptor locations at which the 1-hour NO₂ SIL of 7.5 micrograms per cubic meter ($\mu g/m^3$) was predicted to be exceeded in an area north of the GSS site. This value was based on a 5-year average of the maximum predicted concentration at each receptor location. The maximum predicted 1-hour NO₂ concentration in any year was 8.4 μ g/m³, which is only 16 percent above the SIL. The northern action area is located approximately 21 to 25 km northeast of the GGS site in an area of elevated terrain and encompasses approximately 2,900 acres. It should also be noted that these impacts were not predicted to occur during normal operations but only during hours of startup and shutdown, i.e., when both CTs would be either started up or shut down in the same hour. Each turbine is permitted to operate in startup and shutdown mode for only 6 percent of the total hours of operation. Each startup and shutdown occurs in approximately 10 minutes, while normal operating conditions would occur for the remainder of the hour. The maximum number of hours that emissions would be at a level that the SIL could be exceeded in the action area is approximately 5 percent of the year. However, the number of hours that the meteorological conditions would occur such that the plume could be transported to the action area and would be concentrated enough to cause an impact above the SIL is much smaller, i.e., the startup/shutdown would need to occur when the wind direction, speed, and other parameters were in a narrow range. For the 5-year modeled period, the winds were only in a direction that would result in transport of the plume to the action area approximately 3.9 percent of the time. Considering the total hours that the CTs would startup or shutdown and the total hours that the wind direction would be

| | | Concentration ($\mu g/m^3$) | | | | |
|-------------------|------------|-------------------------------|-----------|---------------|-------|-----------|
| | | TCEQ | | | | |
| D - 11 | Averaging | NA | AQS | Property Line | CII | Maximum |
| Pollutant | Period | Primary | Secondary | Standard | SIL | Predicted |
| NO_2 | 1-Hour | 188 | None | _ | 7.5 | 8.4 |
| | Annual | 100 | 100 | | 1 | 0.2 |
| CO | 1-Hour | 40,000 | None | | 2,000 | 73.5 |
| | 8-Hour | 10,000 | None | | 500 | 29.9 |
| SO_2 | 30-Minutes | — | _ | 1,021 | | 3.3 |
| | 1-Hour | 196 | None | | 7.8 | 5.0 |
| | 3-Hour | None | 1,300 | _ | 25 | <5.0 |
| PM_{10} | 24-Hour | 150 | 150 | | 5 | 0.2 |
| | Annual | | | | | 0.02 |
| PM _{2.5} | 24-Hour | 35 | 35 | | 1 | 0.2 |
| | Annual | 15 | 15 | | 0 | 0.02 |
| H_2SO_4 | 1-Hour | | _ | 50 | | 0.027 |
| | 24-Hour | — | — | 15 | _ | 0.003 |

Source: ECT, 2013.



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favorable, the joint probability of an impact greater than the 1-hour NO₂ SIL occurring would be 0.002 percent or 17 hr/yr. The probability may be even less since the winds would need to be in the low range of wind speeds to result in the higher concentrations. There are no concentrations for secondary NAAQS for 1 hour NO² (see Table 3). Although predicted to occur based on conservative assumptions and methodology appropriate for regulatory modeling, the actual occurrence of an impact greater than the SIL in the action area would be an unlikely event.

4.5 DEFINITION OF ACTION AREA

An action area is defined as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action" (50 CFR 402.02). The site of the project is defined as an action area. Also, for this assessment, the limits of the action area were determined to include the project site (129+ acres) and an offsite area (2.885+ acres) to the northeast defined by using the maximum area in which the proposed project may result in indirect impacts to listed species and were based on air emissions dispersion modeling (see Section 4.4 for details). The offsite area was determined to be located approximately 21 to 25 km northeast of the GGS site and does not encompass the project site. The offsite area is located in Comal County, Texas, in the Edwards Plateau Ecoregion, specifically the Balcones Canyonlands (see Figure 3). The Balcones Canyonlands are characterized by the extent of the escarpment, canyons, stairstep topography, and relative abundance of water with rivers, streams, and springs. Limestone substrate with sinkholes, fissures, and caverns underlies this area. Plant communities vary in this ecoregion according to soil moisture and elevation gradients from mesic riparian to deciduous north-slope forests to evergreen woodlands and oak savanna. A number of endemic plant and animal species has evolved to grow in this area. Anthropogenic influences such as habitat loss and fragmentation resulting from agriculture and urbanization, fire suppression, and introduction of exotic animal species for hunting have had deleterious effects on native plant and wildlife species (Griffith *et al.*, 2007^2).

² Griffith, G., S. Bryce, et al. 2007. Ecoregions of Texas, December 27.

Because an offsite area was determined to be included in the action area, which is located approximately 21 to 25 km northeast of the GGS site and does not include the project site, field surveys within the limits of the offsite area were not conducted, because the area is mostly private property with no available access (see Appendix B, Photographs 3 through 5). A close examination of available map resources (Google™Earth, Bing® maps, and landcover map produced by EPA [2012]) for the offsite action area, proved that there are no wetland habitats/aquatic environments located in the offsite action area. Approximately half of the area is dominated by a grassy field associated with an airport strip. Another portion of the offsite action area falls within an active residential area, as evidenced by the housing development. Photographs of the offsite action area taken from the road (Appendix B) show an area dominated by scattered oaks and juniper. Other than the previously described offsite area and a 0.25-mile transmission corridor constructed alongside the current transmission line to interconnect with the existing Marion substation, no other offsite areas are included with the project site in the action area. There will be no water discharges or construction activities (i.e., laydown areas) outside the plant boundaries.

4.6 ASSESSMENT OF IMPACTS IN THE ACTION AREA

EPA's screening procedure³ was used as a guide to see if the project has the potential to adversely affect air quality and in turn impact plants, soils, or animals in the action area. As was mentioned previously in Subsection 4.2, Air Quality Modeling Results, the maximum predicted 1-hour NO₂ concentration in any year was 8.4 μ g/m³, compared to greater than 3,760 μ g/m³ used in the screening procedure as the suggested screening value at which the most sensitive vegetation becomes affected. Because the maximum predicted impact from the installation of the two proposed simple-cycle CTs is 8.4 μ g/m³, which represents approximately 0.2 percent of the suggested screening value of 3,760 μ g/m³, no impacts to vegetation are expected to result from the operation of the two proposed simple-cycle CTs.

³ U.S. Environmental Protection Agency (EPA). 1980. A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals. EPA 450/2-81-078. December 12.

No research was found that quantified the toxicological effects of air emissions for any listed species. In general, air pollution has a greater effect on lower life forms, such as lichens, mosses, fungi, and soft-bodied aquatic invertebrates, as opposed to more complex life forms, with impacts typically being linked to food loss and reproductive effects rather than to direct toxic effects on adults (Dudley and Stolton, 1996^4). Animal species also have a greater mobility, provided available habitat is present. Possible cumulative effects of airborne NO₂ on aquatic ecosystems include acidification and eutrophication, but NO₂ concentrations associated with the project are low, and no aquatic ecosystems are known to occur within the action area. Finally, because effects on vegetation would occur first and then be transferred to animals via the food chain, and because no impacts to vegetation are foreseen, the proposed action should not have any adverse effects on federally listed plant or animal species.

No trace metals are associated with combustion of natural gas in CTs; therefore, no impact on soils is expected.

Thus, according to the results of the analysis shown herein, the proposed project will not cause any significant impacts on soils, water, vegetation, or wildlife.

⁴ Dudley, N., and S. Stolton. 1996. Air Pollution and Biodiversity: A Review. World Wildlife Fund, International, Switzerland.

5.0 FEDERALLY LISTED SPECIES

5.1 PROTECTED SPECIES REGULATIONS

This assessment is being conducted to demonstrate compliance with the ESA. Section 7 of the ESA, as amended (Chapter 16, Part 1531 *et seq.*, U.S.C.) directs all federal agencies to use their existing authorities to conserve threatened and endangered species and, in consultation with USFWS and/or National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS), to ensure that their actions do not jeopardize listed species or destroy or adversely modify critical habitat. Section 7 applies to federal actions that may affect listed species, including federal approval of private activities through the issuance of federal permits, licenses, or other actions.

Section 7 of the ESA requires that federal agencies ensure that any activity an agency funds, authorizes, or carries out does not jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat (16 U.S.C. 1536). ESA-implementing regulations found at 50 CFR 402 require federal agencies to prepare a BA to determine whether a proposed action may affect a listed species. Where an agency determines that a proposed action will have no effect on a listed species, consultation with USFWS is not required. Where a federal agency determines that a proposed action may affect a listed species, consultation with USFWS is not required.

Where an action agency determines in its BA that a proposed action may affect, but is not likely to adversely affect a listed species, and USFWS concurs in writing with such determination, consultation with USFWS is complete. This is known as informal consultation. Where, however, the action agency determines that a proposed action is likely to adversely affect a listed species or where USFWS does not concur with an action agency's not-likely-to-adversely-affect determination, then formal consultation between the action agency and USFWS is required. Formal consultation culminates with USFWS issuing its biological opinion as to whether the action, as proposed, will jeopardize the continued existence of the listed species at issue. Where USFWS determines that the proposed action will not jeopardize a listed species, USFWS will include in its biological opinion an incidental take statement, which authorizes take that could occur in connection with the proposed action. Where USFWS determines that a proposed action will jeopardize a listed species, USFWS will provide in its biological opinion reasonable and prudent alternatives to the proposed action which, in the opinion of USFWS, will avoid jeopardy. Reasonable and prudent alternatives must be within the scope of the action agency's authority, must be economically and technically feasible, and must be able to be implemented in a manner consistent with the intended purpose of the action (50 CFR 402).

5.2 FEDERALLY LISTED SPECIES ASSESSMENT

A review of the of Texas Natural Diversity Database (TXNDD) and USFWS Critical Habitat for Threatened and Endangered Species databases were queried and reviewed for documented rare species and resource occurrences within the action area. None were located within or in proximity to the action area. Based on the results of a USFWS and Texas Parks and Wildlife Department (TPWD) search of listed species and other data sources, federally regulated species or candidate species proposed for potential federal listing are known to occur within Guadalupe and Comal Counties (i.e., the locations of the project site and offsite area, respectively) (Table 4). The listed fish and crustacean species provided in Table 4 are endemic to either Comal and Hueco Springs or Comal and Nueces Rivers. These features are located more than 10 miles away from the offsite action area. Because the project is a zero liquid discharge facility and the action area has no aquatic habitats to support fish, crustaceans, or mollucks, they are omitted from the following discussion. No federally listed plant species are listed for Guadalupe or Comal Counties.

A brief description of the species appearing in the Table 4 is provided in the following paragraphs.

5.2.1 INTERIOR LEAST TERN (*Sterna antillarum athalassos*)

This species is federally and state listed as endangered. Least terns are the smallest North American terns, averaging 8 to 10 inches in length. Adult plumage is gray above and white below with black marking on the head. In Texas, the species may use shallow

| | Common Name |
|----|---|
| | <u>Mammals</u> Red wolf |
| | Louisiana black bea |
| | Jaguarundi <u>Birds</u> Interior least tern |
| H- | Sprague's pipit |
| z | Whooping crane |
| ш | Black-capped vireo |
| MU | Golden-cheeked warbler |
| 00 | <u>Mollusks</u> Golden orb |
| Ō | Texas fatmucket |
| | Texas pimpleback |
| N | <u>Fish</u> Fountain darter |
| CH | <u>Crustaceans</u> Peck's cave amphi _l |
| AR | <u>Insects</u> Comal Springs dryopid beetle |
| | Comal Springs riffl beetle |
| EP | <u>Plants</u> Bracted twistflower |
| S | * C = federal can LE = federally lis LT = federally lis |
| | |

Table 4. Federally Listed and Candidate Species Occurring in Guadalupe and Comal Counties, Texas

Scientific Name

Federal

Status*

nmals wolf Canis rufus LE Now extirpated; formerly known throughout eastern half of Texas, in brushy and forested areas and coastal prairies siana black bear LT Inaccessible forested areas potential habitat exists in the eastern Ursus americanus part of the state arundi Herpailurus yaguarondi LE Thick brushland, near water sources S or least tern Sterna antillarum LE Nests along sand and gravel bars within braided streams, rivers; also on manmade structures (inland beaches, wastewater treatathalassos ment plants, gravel mines, etc.) С Strongly tied to native upland prairie; can be locally common in gue's pipit Anthus spragueii coastal grasslands LE From coastal marshes and estuaries to inland marshes, lakes, oping crane Grus americana ponds, wet meadows, rivers, and agricultural fields Oak-juniper woodlands with distinctive patchy, two-layered LE k-capped vireo Vireo atricapilla aspect; shrub and tree layer with open, grassy spaces len-cheeked Setophaga chrysoparia LE Juniper-oak woodlands; dependent on Ashe juniper for long fine bark strips, only available from mature trees, used in nest conler struction; nests are placed in various trees; only a few mature junipers or nearby cedar brakes can provide the necessary nest material; forages for insects in broad-leaved trees and shrubs lusks len orb Ouadrula aurea С Sand and gravel in some locations, and mud at others s fatmucket Lampsilis bracteata С Streams and rivers, sand, mud, or gravel substrates; moderately flowing water; Colorado and Guadalupe river basins С Sand, mud or gravel substrates; prefers slow flowing water; s pimpleback Quadrula petrina Colorado and Guadalupe river basins tain darter Etheostoma fonticola LE Endemic to San Marcos and Comal Rivers; springs and springfed streams in dense beds of aquatic plants growing close to bottom staceans LE Lives underground in the Edwards aquifer; collected at Comal 's cave amphipod Stygobromus pecki Springs and Hueco Springs <u>cts</u> al Springs LE Streams Stygoparnus comalensis pid beetle al Springs riffle Heterelmis comalensis LE Comal and Marcos Springs e ts ed twistflower С Over limestone in oak and juniper woodlands; endemic to Ed-Streptanthus bracteatus wards Plateau

= federal candidate for listing; formerly Category 1 candidate.

= federally listed endangered.

= federally listed threatened.

Sources: TPWD, 2013. ECT, 2013.

Preferred Habitat

water habitats along the Gulf Coast region during the winter season. During the breeding season, the interior least tern uses several reservoirs in southern Texas and portions of the Canadian and Red Rivers in northern Texas. The interior least tern is a user of larger riverine and open waters in Texas; none of these habitats occur within the action area, therefore, there is no likelihood for the species occurrence. In addition, even if the least tern should occur within the action area, no impact is expected on the least tern by direct effects such as noise, dust, or human activities or by indirect effects from air emissions such as acidification or eutrophication of aquatic habitats associated with construction and operation of the project.

5.2.2 SPRAGUE'S PIPIT (Anthus spragueii)

Sprague's pipit is currently not listed by federal or state agencies but is considered as a candidate for federal listing. Candidate species do not receive statutory protection under the ESA, but are protected under the Migratory Bird Treaty Act. Sprague's pipit is a federal candidate for listing in Guadalupe and Comal Counties. Sprague's pipits are small, migratory passerines with a slender shape and relatively narrow bill. Their underparts are brown with broad black streaks. Legs are yellowish to pale brown. The upper mandible is dark and contrasts with the pale lower mandible. The only population of Sprague's pipit occurs within North America. Known breeding sites are located in Canada, Montana, North and South Dakota, and Minnesota. Wintering grounds are located in Arizona, New Mexico, Texas, Oklahoma, Arkansas, Mississippi, Louisiana, and northern Mexico. Migration occurs in April to May and September to November. Preferred habitat includes well drained, open grasslands with native midgrasses of intermediate thickness and with moderate litter depths. Preferred grasslands are undisturbed. Prescribed burning, grazing, or mowing can be tolerated after about 1 year. The birds feed primarily on arthropods and occasionally seeds. Nests are made on the ground of woven dried grasses in a shape of a cup. Average clutch size is 4.5, and young are cared for by the female for approximately 25 days until fledging⁵. Given that there are currently cattle grazing on the Project Site, the likelihood of occurrence for these species on site is very low. In addition, even if Sprague's pipit should occur within the action area, no impact is expected by direct ef-

⁵ National Audubon Society. 2013. Sprague's Pipit. Accessed August.

<<u>http://birds.audubon.org/species/sprpip</u>>.

fects such as noise, dust, or human activities or by indirect effects from air emissions such as acidification or eutrophication of aquatic habitats associated with construction and operation of the project.

5.2.3 WHOOPING CRANE (Grus americana)

The whooping crane is federally and state listed as endangered. It is considered North America's tallest bird (with a standing height of approximately 5 ft), as well as one of its rarest. According to USFWS, the only self-sustaining wild population is the Aransaswood buffalo population (AWBP). The AWBP nests in Canada at the Wood Buffalo National Park in the summer and over-winters on the central Gulf Coast of Texas at Aransas National Wildlife Refuge. During migration, these cranes typically stop to rest and feed in open bottomlands of large rivers and marshes but, like other water fowl, may also utilize croplands, playas, and various other aquatic features. It breeds in prairie wetlands, preferring small, shallow lakes and ponds, willow communities, marshes, mudflats, and perhaps sedge meadows. The project site is not located in the migratory path of the whooping crane (Cornell, USFWS, 2007). While migrating during spring and fall, the whooping cranes can be blown or driven off their preferred routes. Records also indicate that during unseasonable conditions such as drought, whooping cranes will travel great distances in search of food (USFWS). The onsite action area does not offer suitable habitat for nesting and/or feeding due to the site's lack of any vegetation aside from recently grazed grasses and thorny shrubs (see Sections 2.1 and 2.2). Therefore, the possibility of a whopping crane using the site is remote. At best, it is theoretically possible the species may be seen flying overhead along its migratory route, if it gets driven off its preferred migratory route, which ranges between approximately 30 and 100 miles east of the project site and offsite action areas (see Figure 4). In addition, even if whooping crane should occur within the action area, no impact is expected by direct effects such as noise, dust, or human activities or by indirect effects from air emissions such as acidification or eutrophication of aquatic habitats associated with construction and operation of the project.



5.2.4 BLACK-CAPPED VIREO (Vireo atricapilla)

The black-capped vireo is federally and state listed as endangered. USFWS listed the bird in 1987. The black-capped vireo only measures 4.5 inches long. Its crown and upper half of the head is black with a partial white eye-ring and lores. The iris is brownish-red, and the bill is black. The bird nests from April through July and spends the winter on the western coast of Mexico. They build cup-shaped nests in the forks of branches approximately 2 to 4 ft above the ground. Nests are usually built in shrubs such as shin oak or sumac. Females lay three to four eggs, which hatch in 14 to 17 days. Both parents incubate the eggs and feed the chicks. Their diet consists of insects. The black-capped vireo prefers oak-juniper woodlands with a distinctive patchy (separated by open grassland), two-layered aspect. They are found throughout the Edwards Plateau and eastern Trans-Pecos regions of Texas. Recent land development, combined with altered natural fire cycles and natural species competition, has led to the decline of the species. Because the onsite action area is located approximately 10 km south of Edwards Plateau in the Texas Blackland ecoregion, and because the site is completely devoid of natural habitat required by the species, either for forage or nesting, being dominated by common carpetgrass and Bermuda grass, it is unlikely the black-capped vireo would be found on the project site. In addition, even if black-capped vireo should occur within the offsite action area, no impact is expected by direct effects such as noise, dust, or human activities or by indirect effects from air emissions such as acidification or eutrophication of aquatic habitats associated with construction and operation of the project.

5.2.5 GOLDEN-CHEEKED WARBLER (Setophaga chrysoparia)

The golden-cheeked warbler, also known as the gold finch of Texas, is federally and state listed as endangered. Golden-cheeked warblers nest in ashe juniper and oak trees in ravines and canyons of the Edwards Plateau. They use bark and spider webs to build their nests from mid-March into late June or early July. Females usually lay three to four eggs. The birds eat insects and spiders, and the adult warbler can reach a length of 4.5 inches. They are known to winter in southern Mexico (Chiapas), Guatemala, Honduras, and Nicaragua. The warbler is endangered due to loss of suitable habitat to development and agriculture. Because the onsite action area is located approximately 10 km south of Edwards Plateau in the Texas Blackland ecoregion, and because the site is completely de-

void of natural habitat required by the species, either for forage or nesting, and is dominated by common carpetgrass and Bermuda grass, it is unlikely the golden-cheeked warbler would be found on the project site. In addition, even if golden-cheeked warbler should occur within the offsite action area, no impact is expected by direct effects such as noise, dust, or human activities or by indirect effects from air emissions such as acidification or eutrophication of aquatic habitats associated with construction and operation of the project.

5.2.6 **RED WOLF** (*Canis rufus*)

The red wolf is federally and state-listed as endangered. USFWS declared the red wolf extinct in the wild in 1980. The red wolf is one of only two wolf species in the world. Their fur is a reddish color, especially on its legs and sides, and they are smaller in size than the gray wolf. The average adult red wolf grows up to 4 ft in length and weighs between 45 and 80 pounds. Red wolves are thought to prefer brushland, forests, swamps, and prairies. Dens are known to be found in hollow trees or on the sandy slope of a hill or drainage ditch. Originally, the red wolves were found throughout the southeastern United States. In 1987, captive individuals were released to the wild in North Carolina. This reintroduced population is reportedly thriving and growing. Red wolves feed on rabbits, deer, raccoons, and rodents. They live in packs of five to eight, which typically consist of one breeding pair and their offspring. Due to the rarity of the species and because the action area is surrounded by a fence, the likelihood of the red wolf using the action area is extremely low. In addition, even if a red wolf could occur within the action area, no impact is expected by direct effects such as noise, dust, or human activities or by indirect effects from air emissions such as acidification or eutrophication of aquatic habitats associated with construction and operation of the project.

5.2.7 LOUISIANA BLACK BEAR (Ursus americanus)

The black bear is federally and state-listed as threatened. It is one of the largest mammals in North America and was historically widespread throughout Texas but is now restricted to remnant populations in mountainous areas of the Trans-Pecos region (Davis and Schmidly, 2004⁶). The Louisiana black bear was historically found in eastern Texas. This subspecies is now restricted primarily to the Tensas and Atchafalaya River Basins in Louisiana, where its habitat consists primarily of bottomland hardwood timber. The Louisiana black bear is not known to occur in Texas, although potential habitat exists in the eastern part of the state (TPWD, 2013⁷). There is no preferred habitat and no documented occurrences for Louisiana black bear in the action area. Due to the rarity of the species, and because the project site is surrounded by a fence, the likelihood of the black bear using the action area is extremely low. In addition, even if the black bear could occur within the action area, no impact is expected by direct effects such as noise, dust, or human activities or by indirect effects from air emissions such as acidification or eutrophication of aquatic habitats associated with construction and operation of the project.

5.2.8 JAGUARUNDI (Herpailurus yaguarondi)

Jaguarundi is federally and state listed as endangered. In appearance, it is slightly larger than a domestic cat, has a long tail, and weighs approximately 8 to16 pounds with solid color of either rusty-brown or charcoal gray coat. Their diet consists mainly of birds, rabbits, and small rodents. Jaguarundi occurs in the brush country of extreme southern Texas in Cameron, Hidalgo, Starr, and Willacy Counties—where it is rare (Davis and Schmidly, 1994⁶). Jaguarundis are inhabitants of the dense, thorny thickets of southern Texas where cacti, mesquite, cat claw, granjeno, and other spiny vegetation are abundant (TPWD, 2013⁷). The action area has no habitat to support jaguarondis, and there are no documented occurrences for them in the action area. Due to the rarity of the species and because the action area lacks appropriate habitat to support jaguarundis, the likelihood of them using the action area is low. In addition, even if the species could occur within the action area, no impact is expected by direct effects such as noise, dust, or human activities or by indirect effects from air emissions such as acidification or eutrophication of aquatic habitats associated with construction and operation of the project.

⁶ Davis, W.B., and D.J. Schmidly. 1994. The Mammals of Texas (revised edition). Texas Parks and Wildlife Department, Austin, Texas. Accessed December. <<u>http://www.nsrl.ttu.edu/tmot1/Default.htm</u>>.

⁷ Texas Parks and Wildlife Department (TPWD). 2013. Accessed December. <<u>http://www.tpwd.state.tx.us/</u> <u>huntwild/wild/species/</u>>.

5.2.9 BRACTED TWISTFLOWER (*Streptanthus bracteatus*)

Bracted twistflower is currently considered as a candidate for federal listing. It is a species of flowering plant in the mustard family. This flower is endemic to Edwards Plateau in Bandera, Bexar, Comal, Medina, and Real Counties (Poole et al., 20078). This glabrous annual herb has a simple or branching stem up to 1.2 meters tall. Leafs are alternate, with basal leaves being irregularly lobed, up to 15 centimeters (cm) long, and the leaves higher on the stem have smooth or toothed edges and up to 8 cm long. The inflorescence is a raceme of flowers and bracts. Each flower is bell-shaped and has four lavender-purple petals that may be nearly 2 cm long. The blooming time is from mid-April to late May. The fruit is a long, flattened silique up to 12 cm in length, with numerous seeds (Poole et al., 2007). It occurs on rocky hillsides and slopes, and is usually found growing under a dense layer of shrubs, where is it difficult for deer to get to it. Browsing by white tailed deer is a major cause for mortality of the plant (School of Biological Sciences at UT Austin, 2013)⁹. Due to the rarity of the species, the likelihood of flower occurring in the action area is low. In addition, even if the species could occur within the action area, no impact is expected by direct effects such as noise, dust, or human activities or by indirect effects from air emissions such as acidification or eutrophication of aquatic habitats associated with construction and operation of the project.

5.2.10 WATER-DEPENDENT SPECIES: FISH, MOLLUSKS, CRUSTACEANS, AND INSECTS

Fountain darter (*Etheostoma fonticola*) is a fish listed as endangered by USFWS. Peck's cave amphipod (*Stygobromus pecki*) is a crustacean listed as endangered by USFWS. The golden orb (*Quadrula aurea*), Texas fatmucket (*Lampsilis bracteata*), and Texas pimpleback (*Quadrula petrina*), all mollusks, are listed as candidate species for federal listing. Two insects, Comal Springs dryopid beetle (*Stygoparnus comalensis*) and Comal Springs riffle beetle (*Heterelmis comalensis*), are listed as endangered by USFWS. The listed fish, mollusk, crustacean, and insect species provided in Table 4 are either endemic to either Comal, San Marco, and Hueco Springs or Comal and Nueces Rivers or are de-

⁸ Poole, J.M., W.R. Carr, D.M. Price, and J.R. Singhurst. 2007. Rare plants of Texas. Texas A&M University Press, College Station, Texas.

⁹ School of Biological Sciences at UT Austin. 2013. Norma Fowler and Lab Group. Accessed December. <<u>http://www.sbs.utexas.edu/fowler/streptanthus/bracted_twistflower.htm</u>>.

pendent on aquatic environments for habitat (TPWD, 2013⁷). These features are located more than 10 miles away from the offsite action area. Because the project is a zero liquid discharge facility and the action area has no aquatic habitats to support fish, crustaceans, or mollusks, it highly unlikely that these species would occur in the action area. In addition, even if aquatic habitat was present in the action area and could support species discussed above, no impact is expected by direct effects such as noise, dust, or human activities or by indirect effects from air emissions such as acidification or eutrophication of aquatic habitats associated with construction and operation of the project.

6.0 CONCLUSION

GPP has conducted a BA of the impact of the construction and operation of the proposed simple-cycle CTs at GGS to federally listed species. This BA included both a desktop review of all federally listed species, as well as a comprehensive onsite ecological survey of the proposed site. As shown in Table 5, the results of this BA conclude that there will be no effect on any of the federally listed species in Guadalupe or Comal Counties, Texas, due to the construction or operation of the proposed simple-cycle CTs at GGS. This determination of no effect as described by USFWS means there will be no impacts, either positive or negative, to the listed species. Concurrence with USFWS should not be required.

| Common Name | Scientific Name | Conclusion |
|------------------------------|------------------------------|------------|
| <u>Mammals</u> | | |
| Red wolf | Canis rufus | No effect |
| Louisiana black bear | Ursus americanus | No effect |
| Jaguarundi | Herpailurus yaguarondi | No effect |
| <u>Birds</u> | | |
| Interior least tern | Sterna antillarum athalassos | No effect |
| Sprague's pipit | Anthus spragueii | No effect |
| Whooping crane | Grus americana | No effect |
| Black-capped vireo | Vireo atricapilla | No effect |
| Golden-cheeked warbler | Setophaga chrysoparia | No effect |
| <u>Mollusks</u> | | |
| Golden orb | Quadrula aurea | No effect |
| Texas fatmucket | Lampsilis bracteata | No effect |
| Texas pimpleback | Quadrula petrina | No effect |
| <u>Fish</u> | | |
| Fountain darter | Etheostoma fonticola | No effect |
| <u>Crustaceans</u> | | |
| Peck's cave amphipod | Stygobromus pecki | No effect |
| <u>Insects</u> | | |
| Comal Springs dryopid beetle | Stygoparnus comalensis | No effect |
| Comal Springs riffle beetle | Heterelmis comalensis | No effect |
| <u>Plants</u> | | |
| Bracted twistflower | Streptanthus bracteatus | No effect |

Table 5. Effect of Construction and Operation of Proposed Simple-Cycle CTs on Federally Listed Species in Guadalupe and Comel Counties, Texas

Source: ECT, 2013.

REFERENCES

- ¹ U.S. Geological Survey (USGS). 2013. Texas Blackland Prairies Ecoregion Summary. Accessed July 16. <<u>http://landcovertrends.usgs.gov/gp/eco32Report.html</u>>.
- ² Griffith, G., S. Bryce, *et al.* 2007. Ecoregions of Texas, December 27.
- ³ U.S. Environmental Protection Agency (EPA). 1980. A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals. EPA 450/2-81-078. December 12.
- ⁴ Dudley, N., and S. Stolton. 1996. Air Pollution and Biodiversity: A Review. World Wildlife Fund, International, Switzerland.
- ⁵ National Audubon Society. 2013. Sprague's Pipit. Accessed August. <<u>http://birds.audubon.org/species/sprpip</u>>.
- ⁶ Davis, W.B., and D.J. Schmidly. 1994. The Mammals of Texas (revised edition). Texas Parks and Wildlife Department, Austin, Texas. Accessed December. <<u>http://www.nsrl.ttu.edu/tmot1/Default.htm</u>>.
- ⁷ Texas Parks and Wildlife Department (TPWD). 2013. Accessed December. <<u>http://www.tpwd.state.tx.us/huntwild/wild/species/</u>>.
- ⁸ Poole, J.M., W.R. Carr, D.M. Price, and J.R. Singhurst. 2007. Rare plants of Texas. Texas A&M University Press, College Station, Texas.
- ⁹ School of Biological Sciences at UT Austin. 2013. Norma Fowler and Lab Group. Accessed December. <<u>http://www.sbs.utexas.edu/fowler/streptanthus/bracted_twistflower.htm</u>>.

APPENDIX A

GGS SITE ACTION AREA PHOTOGRAPHS



Photograph A-1—Southeastern border of project site along fence line



Photograph A-2—Typical view of project site from southeast looking northwest



Photograph A-3—Mourning doves (*Zenaida macroura*) on power lines along eastern edge of project site



Photograph A-4—Project site near southern edge looking south



Photograph A-5—Project site near southern edge looking south



Photograph A-6—Typical view of site from the south looking northeast



Photograph A-7—Typical view of site from center of site toward the west with a killdeer (*Charadrius vociferus*) near the picture center



Photograph A-8—From the center of the site looking south at existing combined-cycle CTs



Photograph A-9—Typical view of project site from the southwest looking east



Photograph A-10—Acacia (Acacia sp.), common across the site



Photograph A-11—Twisted acacia (Acacia schaffneri), common across the site



Photograph A-12—Bare patch of earth below a twisted acacia



Photograph A-13—View along western edge of site looking west across pasture



Photograph A-14—Abandoned burrow of an unknown mammal



Photograph A-15—Abandoned burrow of an unknown mammal



Photograph A-16—Male and female scissor-tailed flycatcher (*Tyrannus forficatus*) perching on power lines just north of project site



Photograph A-17—Male and female scissor-tailed flycatcher (*Tyrannus forficatus*) perching on power lines just north of project site



Photograph A-18—Mourning dove (*Zenaida macroura*) perching on power lines just north of project site



Photograph A-19—Coyote (Canis latrans) tracks just east of project site



Photograph A-20—Coyote (Canis latrans) tracks just east of project site



Photograph A-21—Coyote (Canis latrans) tracks just east of project site

APPENDIX B

OFFSITE ACTION AREA PHOTOGRAPHS



Photograph B-1—View of action area from the road



Photograph B-2—View of action area from the road



Photograph B-3—View of action area from the road



Photograph B-4—View of action area from the road



Photograph B-5—View of action area from the road



Photograph B-6—View of action area from the road