Biological Assessment

Victoria Power Station Expansion
Victoria County, Texas

Prepared for

Victoria WLE, LP

Prepared by

Whitenton Group, Inc.

September 2013
Revised June 2014

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ACRONYMS

AOI	Area of Impact
BACT	Best Available Control Technology
BA	Biological Assessment
CO	Carbon Monoxide
ESL	Effects Screening Levels
ESA	Endangered Species Act
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
GHG	Greenhouse Gas
GLCmax	Maximum ground level concentration
gpm	Gallons per Minute
HRSG	Heat recovery steam generator
ISA	Integrated Science Assessment
mAOI	Maximum Area of Impact
MW	Megawatt
MSS	Maintenance, Startup, and Shutdown
NAAQS	National Ambient Air Quality Standards
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxide
PM	Particulate Matter
PSD	Prevention of Significant Deterioration
RBLC	RACT/BACT/LAER Clearinghouse
RPS	RPS Group
SCR	Selective Catalytic Reduction
SIL	Significant Impact Level
SO_2	Sulfur Dioxide
SWPPP	Stormwater Pollution Prevention Plan
TCEQ	Texas Commission on Environmental Quality
TNDD	Texas Natural Diversity Database
TPDES	Texas Pollutant Discharge Elimination System
TPWD	Texas Parks and Wildlife Department
US	United States
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
Victoria	Victoria WLE, LP
VOC	Volatile Organic Compound
WGI	Whitenton Group, Inc.

1.0 EXECUTIVE SUMMARY

Victoria WLE, LP (Victoria) currently operates a power generating facility in Victoria County, Texas. Victoria proposes to expand the existing Victoria Power Station and to increase the production capacity by installing an additional natural gas-fired turbine and heat recovery steam generator (HRSG) with duct burners within the existing plant footprint. The resulting new facility will be a combined cycle generating unit in a 2 by 2 by 1 configuration (2 combustion turbines, 2 HRSGs with duct burners, and 1 steam turbine). The upgraded facility will increase total gross capacity from 290 megawatts (MW) to 540 MW with net max capacity increasing from 283 MW to 527 MW.

The proposed project is located on the southwest side of the City of Victoria and is bounded by a Southern Pacific Railroad line to the north, Bottom Street to the east, the Guadalupe River on the west, and Wharf Street to the south. The Project Area is located in Victoria County, which is classified as attainment for all National Ambient Air Quality Standards (NAAQS) standards. The station is an existing major source with respect to the Prevention of Significant Deterioration (PSD) program. The project is subject to PSD review for nitrogen oxides (NO_x), carbon monoxide (CO), and particulate matter (PM/PM_{10}/$PM_{2.5}$), but not for sulfur dioxide (SO_2) or volatile organic compounds (VOC). The project is also subject to PSD review for greenhouse gases (GHG).

This Biological Assessment (BA) is a complete evaluation of the potential environmental effects the proposed project may have on federally-listed species and/or their potential habitat. Federally-listed species evaluated in this document include federal threatened, endangered, and candidate species. Candidate species are not specifically protected by the Endangered Species Act (ESA), but were evaluated in this BA. This BA includes a field survey and an evaluation of potential environmental effects based on air quality modeling results, construction and operations information, and stormwater and wastewater information provided by Victoria and RPS Group (RPS), Victoria's air quality permitting consultant for the project.

Construction of the proposed expansion will take place on a previously disturbed industrial site within the boundaries of the existing facility and the adjacent property owned by American Electric Power in an area, referred to as the "Project Area," approximately 7.43 acres in size. An additional gas supply pipeline is expected to be constructed and available for service in time to serve the additional capacity added by the project. Construction of the line would be by another entity not affiliated with the project (up to the project boundary) and would potentially include

additional line capacity and connections to other potential customers along the pipeline route. Required permitting and regulatory approvals are expected to be independent of the project. The pipeline will connect the power station to the existing Transco interstate pipeline (or other pipelines) that parallels US Highway 59. The proposed pipeline corridor is located within an existing disturbed road right-of-way and is approximately 2.85 miles in length and a maximum width of 60 feet for a total of approximately 20.4 acres. The proposed pipeline corridor is in the preliminary design phase and may be subject to change in the future. No additional earth disturbance will be required outside of the Project Area and proposed pipeline corridor.

Federally-listed species considered in this BA include Attwater's greater prairie chicken, interior least tern, whooping crane, Sprague's pipit, red wolf, Louisiana black bear, golden orb, and Texas pimpleback. Field surveys included a pedestrian survey of the proposed project area and the portions of the surrounding facility that are not restricted by stringent safety requirements as well as a windshield survey of all habitats visible or terrestrially accessible from public areas within the Action Area. Data were collected to describe resident vegetation communities and assess the potential for occurrence of protected species. No potential federally-listed species habitat was observed within the Project Area.

In support of this BA, RPS performed dispersion modeling of air pollutants that will be emitted by the proposed project in accordance with PSD Permit requirements. The project maximum ground level concentration (GLCmax) values are less than the Significant Impact Levels (SIL) for the following: 1-Hour SO_2, 3-Hour SO_2, 24-Hour SO_2, annual SO_2, 1-Hour CO, 8-Hour CO, annual $PM_{2.5}$, annual PM_{10}, annual nitrogen dioxide (NO_2). Accordingly, these predicted criteria pollutant are considered insignificant based on EPA's SIL analysis method with screening levels set to protect sensitive populations.

Projected impacts for the following three out of twelve pollutants and averaging periods are greater than the designated SIL: 24-Hour $PM_{2.5}$, 24-Hour PM_{10}, and 1-Hour NO_2. The significant areas of impact (AOI) located the farthest distance from the source in all directions were plotted to determine a maximum AOI (mAOI). Since this mAOI boundary includes the Project Area and wastewater and stormwater outfall locations, the Action Area for the BA was defined as the mAOI boundary (Figures 2-5 - Appendix A). The Action Area has a maximum radius of approximately 6.7 miles and includes the following 6 observed habitat types: cropland, pastureland, woodland, shrubland, open water, and riparian.

The maximum predicted concentrations of the modeled non-criteria pollutants are well below their respective Effects Screening Levels (ESL). Accordingly, no adverse welfare impacts are expected to occur within the Action Area as the result of the additional emissions of these pollutants.

Based on the background research described in Section 8.1 and the determinations described in Section 8.2.3, the proposed expansion project will likely have no direct or indirect impact on federally-listed species habitat.

Based on the information gathered for this BA, Whitenton Group, Inc. (WGI) biologists recommend that a finding of no effect be accepted for 4 of the 5 federally-listed threatened and endangered species: Attwater's greater prairie chicken, interior least tern, red wolf, and Louisiana black bear. A determination of may affect, not likely to adversely affect is recommended for the whooping crane. No determination of effect is recommended for the 3 federally-listed candidate species: Sprague's pipit, golden orb, and Texas pimpleback.

2.0 INTRODUCTION

Victoria currently operates a power generating facility in Victoria County, Texas. Victoria proposes to expand the existing Victoria Power Station and to increase the production capacity by installing an additional natural gas-fired turbine and HRSG with duct burners within the existing plant footprint. The resulting new facility will be a combined cycle generating unit in a 2 by 2 by 1 configuration (2 combustion turbines, 2 HRSGs with duct burners, and 1 steam turbine). The upgraded facility will increase total gross capacity from 290 MW to 540 MW with net max capacity increasing from 283 MW to 527 MW.

The Project Area is located in Victoria County, which is classified as in attainment for all NAAQS standards. The station is an existing major source with respect to the PSD program. The project is subject to PSD review for NO_x, CO, and PM/PM_{10}/$PM_{2.5}$, but not for SO_2 or VOC. The project is also subject to PSD review for GHG. The Texas Commission on Environmental Quality (TCEQ) is responsible for issuance of the PSD permit for all pollutants except GHGs. The United States (US) Environmental Protection Agency (EPA) is responsible for the PSD GHG permit.

BAs in support of the PSD GHG permit application are recommended by the USEPA to evaluate the potential for impacts to federally-listed species from a project for which federal authorization must be obtained. This BA documents the complete evaluation of the potential effects of the proposed project on federally-listed species and/or their potential habitat. Federally-listed species evaluated in this document include threatened, endangered, and candidate species. Federal agency regulations for listed species evaluated in this BA are described in Section 4.0.

The purpose of this BA is to research, evaluate, analyze, and document the potential for direct and indirect effects, interdependent and interrelated actions, and cumulative effects on federally-listed species as a result of the proposed expansion project. This BA includes a pedestrian listed-species habitat evaluation of the proposed construction area, a windshield assessment of habitats within the Action Area, and an evaluation of potential environmental impacts based on air quality modeling results, construction information, operation information, and wastewater and stormwater information provided by Victoria and RPS.

The conclusion of this BA will include a recommended determination of effect on federally-listed endangered and threatened species and their habitat: "no effect," "may affect, not likely to adversely affect," or "may affect, likely to adversely affect." These 3 possible determinations, in accordance with guidance offered by the US Fish and Wildlife Service (USFWS) for the purpose of BAs and Biological Evaluations, are described in Section 4.1. A recommended determination of effect will not be included for species listed as candidate.

3.0 ACTION AREA

The BA process requires identification of the proposed project's "Action Area" within which the potential for effects on federally-listed species and their habitats are to be evaluated. "Action Area" is defined in 50 CFR Section 402.02 as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The limits of the project's Action Area were determined based on the dispersion modeling results, the earth disturbance footprint, and any wastewater and stormwater discharge locations.

EPA has established SILs for each NAAQS. SILs are concentrations significantly below their corresponding NAAQS and constitute a de minimis threshold at or below which a potential impact is considered to be insignificant[1]. Based on the results described below in Section 8.1, the

dispersion model predicts concentrations above the SILs at locations outside of the Victoria Power Station for specific pollutants and averaging periods. The coordinates of each receptor with modeled concentrations greater than the SIL for each pollutant were plotted to delineate the AOI. Significant AOIs (represented by a blue dot) are shown on Figures 1-6 (Appendix B). Note: The significant AOIs do not infer that the maximum concentration predicted for each pollutant and averaging period will occur at all locations. Further, the significant AOIs do not infer a frequency of occurrence, but rather a potential location of "significant impact" pollutant concentration.

The significant AOIs located the farthest distance from the source in all directions were plotted to create a mAOI (theoretical) boundary. The furthest distance in any direction from the project emissions sources to concentrations above the SIL for these pollutants was determined to be 6.7 miles. This mAOI boundary was used to define a portion of the Action Area for the BA.

The mAOI boundary encompasses the Project Area, the proposed pipeline, and the wastewater and stormwater discharge locations. Therefore, the Action Area for the BA was defined as the mAOI boundary Figures 2-5 (Appendix A).

This Action Area was utilized to analyze the potential impacts to federally-listed species and/or their habitat by the proposed project. The results of the analysis of potential impacts to federally-listed species are presented in Section 9.0 below.

4.0 AGENCY REGULATIONS

4.1 ENDANGERED SPECIES ACT

The USFWS and the National Oceanic and Atmospheric Administration - National Marine Fisheries Service (NOAA-NMFS) implement the ESA of 1973. "The purpose of the ESA is to protect and recover imperiled species and the ecosystems on which they depend." Imperiled species specifically includes those listed by the USFWS as threatened or endangered[2]. Candidate species are those "the USFWS has enough information to warrant proposing them for listing but is precluded from doing so by higher listing priorities[3]." Candidate species are not specifically protected by the ESA, but were evaluated in this BA.

Section 9 of the ESA prohibits the "take" of threatened and endangered species. "Take" is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." "Harm" is defined as "an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering[4]."

BAs include one of three recommended determinations of effect on federally-listed endangered and threatened and their habitat: "no effect," "may affect, not likely to adversely affect," or "may affect, likely to adversely affect." These 3 possible determinations, in accordance with guidance offered by the US Fish and Wildlife Service (USFWS) for the purpose of Biological Assessments and Evaluations, are described (verbatim) below[5].

1. No effect - A "no effect" determination means that there are absolutely no effects from the proposed action, positive or negative, to listed species. A "no effect" determination does not include effects that are insignificant (small in size), discountable (extremely unlikely to occur), or beneficial. "No effect" determinations do not require written concurrence from the Service unless the National Environmental Policy Act analysis is an Environmental Impact Statement. However, the Service may request copies of no effect assessments for our files.

2. May affect, not likely to adversely affect - A "may affect, not likely to adversely affect" determination may be reached for a proposed action where all effects are beneficial, insignificant, or discountable. Beneficial effects have contemporaneous positive effects without any adverse effects to the species or habitat (i.e., there cannot be a "balancing," where the benefits of the proposed action would be expected to outweigh the adverse effects – see below). Insignificant effects relate to the size of the effects and should not reach the scale where take occurs. Discountable effects are those that are extremely unlikely to occur. This conclusion is usually reached through the informal consultation process, and written concurrence from the Service exempts the proposed action from formal consultation. The federal action agency's written request for Service concurrence should accompany the biological assessment/biological evaluation.

Note: A conclusion or finding of "may affect, but is not likely to adversely affect" by an action agency and the USFWS, consultation with the USFWS is considered complete. This is known as "informal consultation."

3. May affect, likely to adversely affect - A "may affect, likely to adversely affect" determination means that all adverse effects cannot be avoided. A combination of beneficial and adverse effects is still "likely to adversely affect" even if the net effect is neutral or positive. Section 7 of the ESA require that the federal action agency request initiation of formal consultation with the USFWS when a "may affect, likely to adversely affect" determination is made. A written request for formal consultation should accompany the biological assessment/biological evaluation.

   Note: A conclusion or finding of "may affect, likely to adversely affect" by an action agency and the USFWS; or if USFWS does not concur with an action agency's finding of "not likely to adversely affect" determination, then "formal consultation" is required between the action agency and the USFWS. Formal consultation results in the USFWS issuing a biological opinion as to whether or not the action, as proposed, will jeopardize the continued existence of any listed species.

4.2 CLEAN AIR ACT REGULATIONS AND STANDARDS

The Clean Air Act requires air quality standards be maintained to protect public health and the environment. These standards are the NAAQS and are regulated by the EPA. Ambient air is the air to which the general public has access, as opposed to air within the boundaries of an industrial facility. The NAAQS are concentration limits of pollutants in ambient air within a specific averaging time. The NAAQS are classified into 2 categories: primary and secondary standards. Primary standards are set to protect public health, including "sensitive" populations. Secondary standards are set to protect public welfare, including the environment[6].

The EPA has established NAAQS for 6 air pollutants, which are commonly referred to as "criteria pollutants". These 6 criteria pollutants are NO_2, ozone, SO_2, PM, CO, and lead[6]. A geographic area whose ambient air concentration for a criteria pollutant is equal to or less than the primary standard is an attainment area. A geographic area with an ambient air

concentration greater than the primary standard is a nonattainment area. A geographic area will have a separate designation for each criteria pollutant[7].

The Clean Air Act also requires the EPA to establish regulations to prevent significant deterioration of air quality in attainment areas. The EPA established PSD Increments to satisfy this requirement. A PSD Increment is a measure of the maximum allowable increase in ambient air concentrations of a criteria pollutant from a baseline concentration after a specified baseline date. A SIL represents a de minimis or insignificant concentration resulting from the emissions from a proposed project below which the project is not considered to cause or contribute to an exceedance of a NAAQS or PSD Increment for a criteria pollutant[1]. If the emissions increases from a proposed project results in a concentration greater than the established SIL for a pollutant, the permit applicant is required to perform additional analyses to demonstrate that the project emissions will not cause or contribute to an exceedance of a NAAQS or PSD Increment for that pollutant[8].

The air quality analysis to demonstrate compliance with NAAQS and PSD Increments is performed using computer models to simulate the dispersion of the emitted pollutants into the atmosphere and predict ground level concentrations at specified receptor locations in the area around the source of emissions. If the modeled concentration for a given pollutant and averaging period is less than the EPA-specified SIL, the project is determined to have no significant impact on ambient air quality and no further analysis is required for that pollutant and averaging period. If the SIL is predicted by the model to be exceeded for a given pollutant, further modeling of the project emissions combined with existing emission sources in the area is required to estimate total ambient concentrations. The modeling must demonstrate that the total concentration, including an appropriate background, does not exceed the applicable NAAQS and PSD Increment.

5.0 PROJECT DESCRIPTION

5.1 PROJECT PURPOSE AND LOCATION

The purpose of the project is to expand the existing Victoria Power Station and to increase the production capacity by installing an additional natural gas-fired turbine and heat recovery steam generator with duct burners within the existing plant footprint. More specifically, the

expansion project will accomplish the following objectives with regard to the existing Victoria generating facility:

- Add additional capacity to the existing facility through the addition of an F Class gas turbine generator in support of the Electric Reliability Council of Texas's declining reserve margin.

- Capture presently unused capacity in the steam turbine that can only be utilized through the addition of a gas turbine and HRSG to the existing 1 by 1 power block. The project will improve utilization of the Victoria steam turbine generator from approximately 70-100% by capturing 55-65 MW of capacity that is presently unavailable for use without the addition of a second gas turbine and HRSG to the facility.

- Provide the option to convert 50 MW of present duct fired capacity to unfired capacity through the addition of a second gas turbine and HRSG thus significantly improving the incremental heat rate of 28% of the steam turbine capacity.

A process flow diagram for the proposed expansion project is provided as Figure 4-1 (Appendix C).

The proposed project is located at 1205 S. Bottom Street in Victoria, Texas and is immediately adjacent to the Guadalupe River south of downtown Victoria (Figure 1 - Appendix A).

Project location information:

USGS Quads	Latitude/Longitude
Victoria East Victoria West	28.788039, -97.007900

5.2 CONSTRUCTION INFORMATION

5.2.1 CONSTRUCTION DESCRIPTION

Construction of the proposed expansion will take place on a previously disturbed industrial site within the boundaries of the existing facility in an area, referred to as the "Project Area," approximately 7.43 acres in size. An additional gas supply pipeline is expected to be constructed and available for service in time to serve the additional fuel demand added by the

project. Construction of the line would be by another entity not affiliated with the project (up to the project boundary) and would potentially include additional line capacity and connections to other potential customers along the pipeline route. Required permitting and regulatory approvals are expected to be independent of the project. The pipeline will connect the power station to the existing Transco interstate pipeline (or other pipelines) that parallels US Highway 59. The proposed pipeline corridor is located within an existing disturbed road right-of-way and is approximately 2.85 miles in length and a maximum width of 60 feet for a total of approximately 20.4 acres. The proposed pipeline corridor is in the preliminary design phase and may be subject to change in the future. No additional earth disturbance will be required outside of the Project Area and proposed pipeline corridor.

The proposed project will include installation of an additional natural gas fuel pipeline to the facility and demolition of an out of service tower that is adjacent to the proposed expansion. No new intake or outfall structures will be required for this project. The project will utilize existing and previously used staging areas for construction. The Project Area is shown on Figure 2 (Appendix A).

The Victoria Expansion Project will include:

- F Class gas turbine generator with inlet chilling providing for a nominal output rating of 181.5 MW
- Three-pressure HRSG
- New natural gas fuel pipeline
- Selective Catalytic Reduction (SCR) catalyst
- Ammonia feed and control system
- Aqueous ammonia storage
- CO catalyst

The projected construction start date (pending necessary permit approvals) is June 2014. The projected commercial operation date is March 2016.

5.2.2 CONSTRUCTION ACTIVITIES AND SCHEDULE

The total time estimated to complete construction of the project is approximately 21 months. The construction schedule will be 12 hours per day, 6 days per week until completion. The schedule may increase, as needed, to meet the project deadline. The following general construction activities are included:

- Site dirt work
- Installation of drilled shaft foundations and spread footings or driven piles
- Installation of pipe rack and other pipe supports
- Setting of major equipment items (gas turbine, generator, HRSG)
- Installation of inlet chilling equipment on both the existing and new gas turbines
- Installation of rack piping and interconnecting pipe between major equipment
- Installation of additional natural gas fuel supply to the facility
- Installation of Motor Control Center building and associated wiring to equipment motors
- Installation of instrument devices and associated wiring
- Post-erection cleaning and pressure testing of various piping systems
- Installation of insulation
- Controls checkout
- Plant start-up and commissioning
- Touch-up painting

The estimated number of personnel required for construction of the proposed project is an average of 80 and an estimated maximum of 250 for a maximum timeframe of up to 21 months. Any emissions resulting from the construction will be insignificant and temporary.

5.2.3 CONSTRUCTION EQUIPMENT REQUIRED

Equipment required to complete the proposed construction activities and their estimated schedule is listed below.

- One large crane (550 tons) for major lifts – 14 months
- One large crane (250 tons) for tailing of major lifts – 2 months
- Small cranes (80 tons) – 21 months for one, 9 months for one
- Two 4-wheel drive fork lifts – 21 months for one, 14 months for one
- Six utility vehicles – 21 months
- One backhoe – 21 months
- One mini excavator—6 months
- Two air compressors – 18 months
- Three JLG lifts – two for 18 months, one for 6 months
- One scissor lift – 6 months
- Two ground compactors (jumping jacks) – 6 months

- One dump truck – 6 months
- Seven welding machines and generators – 18 months
- Six portable lighting plants – 21 months

5.2.4 STORMWATER

Victoria will follow procedures as prescribed in the Stormwater Pollution Prevention Plan (SWPPP) for construction (to be developed).

5.2.5 CONSTRUCTION NOISE LEVELS

Noise levels during construction should be comparable to noise levels from maintenance activities that currently take place at the plant on a regular basis. The best available technology will be used to maintain noise levels during construction below 75 decibels measured at the property fence line.

5.3 OPERATION AND MAINTENANCE INFORMATION

5.3.1 OPERATION DESCRIPTION

The Victoria Expansion Project will be constructed within the boundaries of the existing facility, immediately adjacent to the existing operational unit. The proposed project will increase the capacity of the existing generating unit and will increase the net output of the facility. SCR and CO catalyst will be used to reduce NO_x and CO emissions and maintain compliance with applicable permits.

The maximum operating schedule is 24 hours per day, 7 days per week, and 52 weeks per year.

Four to six new full-time personnel will be required for operation.

Additional required maintenance associated with the Victoria expansion project will include the following:

- Combustion Inspections, Hot Gas Path, and Major Inspections will be performed on the gas turbine at manufacturer recommended intervals.
- Water wash of the gas turbine will be performed on a semiannual basis.
- Gas turbine inlet filters will require replacement at nominal 2 to 3-year intervals.

- Major inspection of the generator will be required at nominal 6-year intervals with minor repair as required.
- Inspection of the HRSG will be required on an annual basis with repair as required.
- Inspection, overhaul and minor repair of new auxiliary and support equipment for the proposed project will be performed as required or at intervals recommended by the equipment manufacturer.

The plant will be designed and operated in a manner that will ensure compliance with all permit requirements and applicable regulations.

5.3.2 WATER USE

The existing power generation equipment at the Victoria Power Station is permitted to use once-through cooling water taken from the Guadalupe River, and the facility has senior water rights on the Guadalupe River to allow this use. The facility also uses water taken from 6 permitted groundwater wells for cooling and for makeup water to the 8-cell cooling tower.

The total additional water requirement for the Victoria Expansion Project is estimated to be 1,200-1,500 gallons per minute (gpm). Total water requirement including the existing facility is estimated at 3,300-4,000 gpm. All of the water required, less negligible losses due to evaporation, will be discharged to the Guadalupe River and is, therefore, considered non-consumptive.

5.3.3 WASTEWATER

The Victoria Expansion Project will be located within the existing Victoria Power Station boundaries. The Project has an existing Texas Pollutant Discharge Elimination System (TPDES) permit (TPDES Permit No. WQ0001165000). The proposed project would produce an estimated 13-20 gpm additional wastewater and does not require an amendment to the existing TPDES permitted limit of 112 gpm. There will be minimal loss of raw water to evaporation.

Raw water at the Victoria Power Station is utilized primarily for steam and cooling purposes. As such, it is not subject to significant pollutants within the facility before it is discharged into the Guadalupe River. A water flow diagram has been provided in Appendix C. Per the TPDES permit conditions, the wastewater effluent is monitored regularly.

Wastewater from the new facilities would be discharged primarily at Outfall 001, but minor amounts could be discharged from Outfall 002. Outfall locations are demonstrated in Figure 2 (Appendix A).

5.3.4 STORM WATER

Stormwater within the facility is currently routed through drainage ditches to the existing permitted wastewater outfall structures (Outfalls 001 and 002). A SWPPP is not required for operations since the project is a gas-fired power plant. Per the TPDES permit conditions, the wastewater and stormwater combined effluent is monitored regularly.

5.3.5 OPERATION NOISE LEVELS

Project engineers estimate that noise levels during operation should be comparable to noise levels from maintenance activities that currently take place at the existing Victoria Power Station facility.

5.3.6 EMISSION CONTROLS

Per 30 TAC §116.111(a)(2)(c), new or modified facilities must utilize Best Available Control Technology (BACT), with consideration given to the technical practicability and economic reasonableness of reducing or eliminating the emissions from the facility. Each facility is evaluated on a case-by-case basis. The new sources associated with the project are the gas turbine and HRSG with duct burner system, process fugitives, and lube oil vents. The existing cooling tower will be a modified source. This BACT analysis addresses these emission sources. The expansion project is subject to PSD review for NO_x, CO, and $PM/PM_{10}/PM_{2.5}$[9].

5.3.6.1 NO_x

According to the RACT/BACT/LAER Clearinghouse (RBLC), the proposed BACT to minimize NO_x emissions from combustion turbines is the use of a Dry Low NO_x combustor in the turbine and a low NO_x burner in the duct burner with SCR as post-combustion control for combined gas turbine/HRSG system while burning natural gas[9].

The SCR process uses a catalyst reactor with aqueous ammonia injection downstream of the HRSG. NO_x emissions in the exhaust of the HRSG are reduced to nitrogen and water vapor, while aqueous ammonia is oxidized to nitrogen. The operating temperature range best suited for reaction is 500 ºF to 700 ºF. SCR control technology is most commonly used in gas turbines

that operate in cogeneration or combined cycle where the catalyst is installed within the HRSG, where the heat recovery process reduces exhaust gas temperatures to the proper operating range for the catalyst. The catalyst bed is located in the HRSG where the flue gas operating temperature in this range would be expected to occur over the widest range of operating scenarios[9].

5.3.6.2 CO and VOC

CO and VOC emissions from gas-fired furnaces are the result of incomplete fuel combustion caused by conditions such as low temperature, insufficient residence time, or insufficient oxygen in the residence zone. Proper fuel-to-air ratio and a design that provides the necessary residence time, temperature, and turbulence within the combustion zone ensure good combustion to minimize the emission of CO and VOC[9].

5.3.6.3 PM/PM10/PM2.5

Emissions of PM from turbines result from inert solids in the fuel, combustion air and from unburned fuel hydrocarbons that agglomerate to form particles that are emitted in the exhaust. $PM/PM_{10}/PM_{2.5}$ emissions from turbine and duct burner are inherently low because they achieve high combustion efficiencies and burn clean fuels[12].

5.3.6.4 SO2

Emissions of SO_2 from the expansion project will be minimized by burning natural gas in the turbines with minimal sulfur contents[12].

6.0 BACKGROUND INFORMATION

6.1 GENERAL ENVIRONMENTAL INFORMATION

This section provides applicable environmental characteristics for the general region in which the project is located.

6.1.1 GENERAL REGION INFORMATION

The proposed Project Area is located in Victoria County within the EPA's Level IV Northern Humid Gulf Coastal Prairies ecoregion of Texas,[10] which is within the Level III Western Gulf Coastal Plain ecoregion of Texas[11].

The Gulf Coast influence creates multiple dynamic ecosystems within this ecoregion including bays, estuaries, salt marshes, and tidal flats. These ecosystems are home to an abundance and variety of wildlife including mammals, birds, reptiles, amphibians, fish, and invertebrates. This region is prime wintering grounds for migratory birds. The bays and estuaries are invaluable breeding grounds for fish and other aquatic species[12].

The majority of the river basins of Texas drain towards the Gulf of Mexico. This ecoregion also receives more rainfall than many other ecoregions in Texas. As a result, this region is ecologically diverse inland, as well as immediately adjacent to the coastline. Freshwater wetlands, marshes, and swamps as well as hardwood bottomlands, prairies, and oak mottes are common throughout this region[12].

The Western Gulf Coastal Plain ecoregion spans the Texas coastline. This area is commonly converted to cropland, ranchland, and industrial development because of the abundant water resources, the rich soils, and the proximity to the coast[10].

6.1.2 LAND USE

Most of the native coastal prairie is now pastureland for cattle grazing or cropland for rice, sugarcane, forage, and grain crops[10]. Other land uses throughout Victoria County include residential, urban, commercial, and other agricultural development. Victoria County is accessible by 3 US highways, rail, air, and a barge canal that is connected to the Gulf Intracoastal Waterway. Oil, manufacturing, agribusiness, petrochemicals, recreation and tourism are the top businesses for the area[10].

Based on the background review, the land use within the proposed project area is currently industrial development. Surrounding land use types include agricultural, residential, and industrial development (Figure 2 – Appendix A). The existing facility is located immediately adjacent to the Guadalupe River.

6.1.3 CLIMATE

The mean annual precipitation in the region is 40.1 inches. The mean annual growing season is 271 days. The average daily temperature is 55 °F in the winter and 84 °F in the summer. Prevailing winds are from the south. Average relative humidity is 91 percent in the morning and 60 percent mid-afternoon[13].

As of June 2012, the US Drought Monitor indicated the survey area is in D2 Drought - Severe[14]. According to the National Weather Service/Advanced Hydrologic Prediction Service, the area has received approximately 2-5 inches of rain within the 30 days prior to the field survey, which is approximately 1-3 inches below normal. For May 2012, precipitation was 0-3 inches below normal[15].

The NOAA – National Climatic Data Center Hydrological Drought Index indicates that Victoria County has been impacted by drought five of the past 6 years (in August). The watersheds that contribute to the project region have been impacted by significant drought conditions for five out of the past 6 years as well[16]. Long-term drought conditions have weakened many ecosystems across Texas. While the coastline has not experienced as severe a deficiency in direct precipitation as have other areas of Texas, it is affected by the limited influx of freshwater from Texas' river basins.

6.1.4 TOPOGRAPHY

Victoria County has low and flat terrain, with an average elevation of 50-300 feet[17]. The topography of the project area is flat with an approximate elevation of 50 feet above sea level (Figure 3 – Appendix A).

According to the Federal Emergency Management Agency (FEMA) flood insurance rate map, the proposed project site and the surrounding area are located within the designated 100-year floodplain. FEMA floodplain designation is demonstrated in Figure 4 (Appendix A)[18].

6.1.5 GEOLOGY

The specific geologic formation found in the area is alluvium from the Holocene Epoch, primarily consisting of sand and silt[19]. The geologic units found within and surrounding the proposed project area are listed and described below in Table 1.

Table 1. Geologic Units Summary[19]

Map Unit	Unit Name and Description	Rock Types
Qal	alluvium	sand, silt, clay, mud, or gravel
Qd	Deweyville Formation	sand, silt, clay, mud, or gravel
Ql	Lissie Formation	sand, silt, clay, mud, or gravel

6.1.6 SOILS

Dominant soils found in Victoria County include: dark, loamy, and clayey under prairie vegetation and light colored, loamy, and sandy under post oak savannah vegetation. The Natural Resources Conservation Service soil units[20] mapped within and surrounding the proposed project area are listed and described in Table 2 (Appendix D).

6.1.7 WATER RESOURCES

Victoria County has abundant water resources and is within the Guadalupe River Basin, the Lavaca-Guadalupe Coastal Basin, and the San Antonio River Basin. Prominent water features in Victoria County include the Guadalupe River, Garcitas Creek, and Arenosa Creek.

The river basin that contributes water resources to the proposed project site is the Guadalupe River Basin. The proposed project site is immediately adjacent to the Guadalupe River[21].

Based on the background review, the water resources in the areas surrounding the project site include rivers, irrigation and drainage canals, retention ponds, groundwater, and potential wetlands. The USFWS National Wetlands Inventory data within, and immediately adjacent to, the proposed project area is demonstrated in Figure 5 (Appendix A)[22].

6.1.8 VEGETATION

Historically, the native plant community of the region was coastal prairie, which is a tallgrass prairie with scattered trees. Most of the native coastal prairie is now pastureland, cropland, or residential, urban, commercial, and industrial development[10].

Development has converted much of the landscape to manicured lawns and ornamental vegetation; and, agricultural practices led to the planting of grain sorghum, cotton, and corn.

Remaining natural vegetation consists of prairie grasslands and riparian forests. Species found in the area include little bluestem (*Schizachyrium scoparium*), yellow Indiangrass (*Sorghastrum nutans*), brownseed paspalum (*Paspalum plicatulum*), gulf muhly (*Muhlenbergia capillaris*), switchgrass (*Panicum virgatum*), live oak (*Q. virginiana*), pecan (*Carya illinoensis*), elms (*Ulmus* sp.), and hackberry (*Celtis* sp.)[10, 23].

6.2 FEDERALLY-LISTED SPECIES

6.2.1 THREATENED OR ENDANGERED SPECIES LIST

Both the Texas Parks and Wildlife Department (TPWD) and the USFWS maintain lists of federally-listed species by county in Texas. Table 3 is a list of federal candidate, threatened, and endangered species with the potential to occur in Victoria County according to TPWD, USFWS, and NOAA[24,25]. For the purposes of this BA, federally-listed species mentioned by these 3 agencies will be discussed. State-listed species are not included in this report.

Table 3. Federally-Listed Species for Victoria County, Texas[24,25]

Common Name	Scientific Name	Species Group	USFWS List Status*	TPWD List Status*
Attwater's Greater Prairie Chicken	*Tympanuchus cupido attwateri*	birds	E	E
Interior Least Tern	*Sterna antillarum athalassos*	birds	E	T
Whooping Crane	*Grus americana*	birds	E	E
Sprague's Pipit	*Anthus spragueii*	birds	C	-
Red Wolf	*Canis lupus rufus*	mammal	E	E
Louisiana Black Bear	*Ursus americanus luteolus*	mammal	T	T
Golden Orb	*Quadrula aurea*	mussel	C	T
Texas Pimpleback	*Quadrula petrina*	mussel	C	T

***E=Endangered, T=Threatened, C=Candidate for Federal Listing**

6.2.2 THREATENED OR ENDANGERED SPECIES DESCRIPTIONS

According to the USFWS, there is no designated critical habitat for any of the federally-listed species within 7 miles of the Action Area[26]. The nearest critical habitat is for whooping cranes, which is located more than 30 miles southeast of the Project Area[26].

A brief description of these species and their habitat requirements are included below.

Attwater's Greater Prairie Chicken

Attwater's greater prairie chickens are smaller and tawnier than *Tympanuchus cupido* (greater prairie chicken)[27]. They are heavily barred above and below with dark brown, cinnamon, and pale buff. Males have inflatable sacs on each side of the neck that make a "booming" sound when inflated[28]. Booming grounds, or leks, are communal display areas named for the sound produced by displaying male prairie chickens[27]. Several studies have stressed the importance of these grounds as focal points for prairie chicken ecology[29]. The booming ground is a specific area typically used year after year. They are usually found on bare ground or short grass areas where the females can easily see the males[29]. They may be naturally occurring short grass flats or artificially maintained areas such as roads, runways, oil well pads, and drainage ditches[27].

Males begin to set up territories in late January to February. Booming is usually heard from about daylight to about 9:00 am and in the late evening. Hens arrive at the booming grounds in late February and early March. Mating occurs in early March and booming activity gradually tapers during the last week of April and the first 2 weeks of May. Males abandon booming grounds by mid-May. Nesting begins in early March with the nest being a well-concealed, shallow depression about 8 inches in diameter lined with dry grass and feathers from the hen. The preferred nest location is in mid- to tall-grass cover with the grass canopy concealing the nest. Hens on average lay 12 eggs and the peak of the hatch is in late April to early May[27,29].

Attwater's prairie chickens are found only in the coastal prairie of Texas. Grass and open space are required by the prairie chickens. A mixture of native grasses of varying heights is optimum habitat. Short grass cover (less than 10 inches in height) is used for courtship, feeding, and to avoid moisture during heavy dew or after rains. Midgrass areas (10-16 inches in height) are used for roosting and feeding. Tall grasses (16-24 inches in height) are used for nesting, loafing, and escape cover[27,29].

Prime habitat consists of tall grass dominated by bunchgrasses such as little bluestem, Indiangrass, switchgrass, and *Andropogon gerardii* (big bluestem) along with flowering plants such as *Ruellia* spp. (wild petunias), *Nothoscordum bivalve* (yellow falsegarlic), and *Ambroisa* spp. (ragweed). They prefer open prairies without any wood cover and avoid

areas with more than 25% shrub cover. Knolls and ridges with minor variations in topography and soils resulting in a variety of vegetation types are characteristics of preferred habitat. Attwater's prairie chickens are mostly granivorous but will also consume insects and other plant parts, such as leaves and buds[27,29].

Interior Least Tern

Interior least terns are small birds, measuring about 8-10 inches long with a 20-inch wingspread. Sexes appear similar; with a black-capped crown, white forehead, grayish back and dorsal wing surface, white undersurface, legs are a variation of orange and yellow colors depending on the sex, and a black-tipped bill whose color also varies depending on sex[30].

The interior least tern is piscivorous, feeding in shallow waters of rivers, streams and lakes. Other least terns also feed on crustaceans, insects, mollusks and annelids. The terns usually feed close to their nesting sites. Fishing occurs close to the riverine colony. Terns nesting at sand and gravel pits and other artificial habitats may fly up to 3.2 km to fish[30].

Breeding colonies or terneries are usually small with nests spaced a few meters apart or widely scattered. Egg-laying and incubation occur from late May to early August, depending on the geographical location and availability of habitat[30].

The interior least tern is migratory and historically bred along the Mississippi, Red and Rio Grande River systems and rivers of central Texas. Distribution generally is restricted to less altered river segments[30].

The riverine nesting areas of interior least terns are sparsely vegetated sand and gravel bars within a wide unobstructed river channel, or salt flats along lake shorelines. Nesting locations usually are at the higher elevations and away from the water's edge because nesting starts when the river flows are high and small amounts of sand are exposed. The size of nesting areas depends on water levels and the extent of associated sandbars[30].

Whooping Crane

The whooping crane is a large bird that stands approximately 5 feet tall and weighs approximately 14-16 pounds. Adult birds have long necks and legs, a white body, a red crown, black primary feathers, and a long, pointed beak. Juveniles are reddish-cinnamon in color[31,32].

Whooping cranes are migratory with the main population breeding in Wood Buffalo National Park in Alberta, Canada (May to October) and wintering on the Texas coast (November to March). During breeding, whooping cranes demonstrate high site fidelity, using the same areas each year. Nests are typically constructed within tall rushes or sedges of marshes, sloughs, or along lake margins. Females lay 2 eggs per season. Parents share rearing duties although the female take the primary role in raising the young[31,32].

Migration occurs twice per year during daylight hours. The main population typically remains within a 200-mile migration pathway from Canada to Texas, and they regularly stop to feed and rest along the way. Whooping cranes use a variety of habitats during migration, including inland marshes, lakes, wetlands, ponds, wet meadows, rivers, and agricultural fields[31,32].

The wintering population primarily occupies habitat in or near the Aransas National Wildlife Refuge near Rockport, Texas. However, the birds have been expanding their winter range due to population increases and climate change[33]. Winter habitat includes brackish bays, marshes, and salt flats[31,32].

Whooping cranes are omnivorous with a diet of crustaceans, mollusks, amphibians, fish, acorns, and berries[31,32].

Red Wolf

The red wolf is one of the world's most endangered canids. Their fur is a reddish color and they are smaller in size than the gray wolf. The average adult red wolf grows up to 5 feet in length and 45-80 pounds[34].

Red wolves are thought to prefer warm, moist, and densely vegetated habitat. They also can be found in pine forests, bottomland hardwood forests, coastal prairies, and

marshes[35]. Little information is available describing red wolf preferred habitat characteristics.

Originally, the red wolves were found throughout the southeastern US. The USFWS declared the red wolf extinct in the wild in 1980. In 1987, captive individuals were released to the wild in North Carolina[36]. This reintroduced population is estimated at 100-120 individuals[34].

Red wolves feed on Lagomorphs (rabbits), *Odocoileus* sp. (deer), *Procyon* sp. (raccoons), and Rodentia (rats and mice). They live in packs of 5-8, which typically consist of 1 breeding pair and their offspring[36].

Louisiana Black Bear

The Louisiana black bear is a large mammal with black fur and a short tail. The facial profile is blunt, eyes small, and a broad nose pad with large nostrils. The muzzle of the Louisiana black bear is yellowish-brown. Some bears have a white patch on the lower throat and chest. Weight varies throughout the range, but males may weigh up to 600 pounds[37].

Originally, Louisiana black bears were known to occur in the forests of eastern Texas, Louisiana, and Mississippi. They typically inhabit bottomland hardwood forests. Other habitat types the Louisiana black bear utilizes include brackish and freshwater marshes, salt domes, and agricultural fields. These bears require large, remote tracts of land with minimal human disturbance[37]. Today, Louisiana black bears primarily occur within the boundaries of the state of Louisiana although sightings of Louisiana black bears are increasing in east Texas[38]. The largest concentration exists in the Atchafalaya River and Tensas River Basins[37,38].

Louisiana black bears are opportunistic feeders with a diet that may consist of acorns, berries, carrion, and insect larvae. In addition the bears may feed on agricultural products such as corn, wheat, and sugarcane[37].

The breeding period for Louisiana black bears is on an alternate-year cycle. Females begin breeding around 3-5 years of age and have a gestation period of 7-8 months. Litter size ranges from 1-4 cubs being born every other year in January or February[37].

6.2.3 CANDIDATE SPECIES DESCRIPTIONS

Sprague's Pipit

Sprague's pipits are small, migratory passerines with a relatively narrow bill and yellowish to pale brown legs. Their underparts are buffy with broad black streaks. The upper mandible is dark and contrasts with the pale lower mandible[39].

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. Nests are a cup shape on the ground, made of woven dried grasses. Average clutch size is 4.6 eggs and young are cared for by the female for approximately 25 days until fledging[39].

Wintering grounds are located in Arizona, New Mexico, Texas, Oklahoma, Arkansas, Louisiana, and Mexico. Migration occurs in April to May and September to November. In Texas, preferred wintering habitat includes grass-forb prairies dominated by little bluestem and *Andropogon* spp. (bluestem) grasses that are about 8 inches in height. They have also been found in old rice fields that have been re-planted with *Cynodon dactylon* (bermudagrass), on turf grass farms, golf courses, and recently burned pastures. Food primarily consists of arthropods and sometimes seeds[39].

Golden Orb

The golden orb is a freshwater mussel and has been located almost exclusively in flowing waters in moderately-sized rivers. It has been found in 1 reservoir in the lower Nueces River (Lake Corpus Christi). The golden orb is endemic to nearly the entire lengths of the Guadalupe, San Antonio, and Nueces-Frio River basins in central Texas, including the Guadalupe, Medina, San Antonio, Frio, and Nueces Rivers and Cibolo Creek[40]. The golden orb is small, usually less than 3.2 inches, with an oval to nearly round, smooth, and unsculptured shell, except for concentric growth rings. External shell coloration varies from yellow-brown, gold, or orangish-brown to dark brown or black, and some individuals may show faint greenish rays. Internally, the nacre is white to bluish-white[40].

Adult freshwater mussels are suspension feeders but will also feed on organic matter in the sediment[41]. Adults feed on algae, bacteria, detritus (dead organic material), microscopic animals, and dissolved organic matter. Mussels tend to grow relatively

rapidly for the first few years, and then slow appreciably at sexual maturity, when energy presumably is being diverted from growth to reproductive activities. As a group, mussels are extremely long lived, living from two to several decades[40,41].

Texas Pimpleback

The Texas pimpleback is a freshwater mussel with a moderately inflated shell that generally reaches 2.4–3.5 inches. With the exception of growth lines, the shell of the Texas pimpleback is generally smooth and moderately thick. Externally, coloration ranges from yellowish-tan to dark brown with some individuals mottled or with dark green rays. Internally, the nacre is white and iridescent posteriorly[41].

Historically, the Texas pimpleback is endemic to the Colorado and Guadalupe-San Antonio River basins of central Texas. However, it has declined significantly rangewide, and only 4 streams (the San Saba River, Concho River, Guadalupe River, and San Marcos River) are known to harbor persisting Texas pimpleback populations. These populations are disjunct, small, and isolated. The species has been extirpated from the remainder of its historical range. The Texas pimpleback typically occurs in moderately-sized rivers, usually in mud, sand, gravel, and cobble, and occasionally in gravel-filled cracks in bedrock slab bottoms. The species has not been found in water depths over 6.6 feet. Texas pimplebacks have not been found in reservoirs, which indicate that this species is intolerant of deep, low velocity waters created by artificial impoundments[41].

Adult freshwater mussels are suspension feeders but will also feed on organic matter in the sediment. Adults feed on algae, bacteria, detritus (dead organic material), microscopic animals, and dissolved organic matter. Mussels tend to grow relatively rapidly for the first few years, and then slow appreciably at sexual maturity, when energy presumably is being diverted from growth to reproductive activities. As a group, mussels are extremely long lived, living from two to several decades[41].

6.2.4 TEXAS NATURAL DIVERSITY DATABASE RESULTS

A records review of the Texas Natural Diversity Database[42] (TNDD) was completed for the survey area by the TPWD on 17 April 2012 and a review of mussel locations, based on TPWD survey results, was conducted on 1 September 2012. Golden orbs were recorded in the Guadalupe River, approximately 1.5 miles north of the project site (El Code IMBIV39030). No

federally-listed species were recorded within the Action Area (maximum radius of approximately 6.7 miles).

7.0 FEDERALLY-LISTED SPECIES HABITAT EVALUATION

WGI completed a listed species habitat evaluation on 25 July 2012 and 12 April 2013 to determine if habitat within the Action Area was likely to support any of the federally-listed species potentially occurring in Victoria County. The field surveys included a pedestrian survey of the proposed Project Area. The field surveys also included a windshield and aerial survey within the Action Area. Data were collected to describe resident vegetation communities and assess the potential for occurrence of federally-listed species. The dominant habitats observed are described below and are demonstrated in Figure 5 (Appendix A). Photographs of the proposed Action Area are included as Appendix E. A summary of the field survey data is provided in Appendix F.

7.1 PLANT COMMUNITIES OBSERVED

The Project Area is a disturbed industrial area consisting of maintained bermudagrass and gravel roadway/parking areas. The majority of the existing facility is industrial infrastructure, gravel, or maintained bermudagrass.

The area to the north and northeast of the facility is predominantly residential (City of Victoria). The area to the east and southeast of the facility is a mixture of residential housing and cropland. The areas to the south, southwest, west, and northwest of the facility include riparian habitat and cropland. The Guadalupe River is immediately west of the project area.

The dominant habitats observed in the Action Area include: cropland, pastureland, woodland, shrubland, open water, and riparian.

Cropland – Crops at the time of the surveys included corn and cotton.

Pastureland – Dominant species observed included bermudagrass, Johnsongrass (*Sorghum halepense*), King Ranch bluestem (*Bothriochloa ischaemum*), lanceleaf coreopsis (*Coreopsis lanceolata*), western ragweed (*Ambrosia psilostachya*), and common sunflower (*Helianthus annuus*).

Riparian – This habitat includes streams and rivers including Spring Creek, Dry Creek, Wright Creek, Court Branch, and the Guadalupe River. Dominant species observed along the banks included hackberry (*Celtis laevigata*), black willow (*Salix nigra*), boxelder (*Sambucus canadensis*), and mustang grape (*Vitis mustangensis*).

Open Water – This habitat includes stock ponds, retention ponds, oxbow lakes, and lakes.

Woodland – This habitat is primarily small, fragmented tracts. Dominant species observed included winged elm, mesquite, pecan (*Carya illinoensis*), hackberry, deciduous holly (*Ilex decidua*), yaupon holly (*Ilex vomitoria*), mustang grape (*Vitis mustangensis*), Chinese tallow (*Triadica sebifera*), and coastal live oak (*Quercus virginiana*).

Shrubland – This habitat is primarily small, fragmented tracts. Dominant species observed included mesquite and huisache.

7.2 FEDERALLY-LISTED SPECIES HABITAT ANALYSIS

The Project Area is a disturbed industrial area consisting of maintained bermudagrass and gravel roadway/parking areas. The proposed pipeline corridor is located within an existing, maintained road right-of-way. The Project Area and the proposed pipeline do not possess habitat with the potential to support any federally-threatened or endangered species.

The habitats observed within the Action Area have historically been impacted by agricultural, commercial, industrial, and residential development activities. The dominant habitats observed in the Action Area include: cropland, pastureland, woodland, shrubland, open water, and riparian.

Cropland typically lack diversity in plant species and habitat structure that are necessary to support the life requirements of most federally-listed species. Whooping cranes can utilize upland grain fields for forage during migration.

The pastureland habitats observed included fragmented, maintained and cattle-grazed fields. The observable quality of this habitat is low to moderate. This habitat does not possess characteristics with the potential to support most of the federally-listed species. The pastureland habitat has a few characteristics with the potential to support Sprague's pipits, migrating whooping cranes, and Attwater's greater prairie-chickens. This potential is analyzed more specifically in Section 9.7.

The woodland habitat areas are primarily small, fragmented tracts. The observable quality of this habitat ranges from low to moderate. The woodland habitats observed within the Action Area did not have characteristics to support any of the threatened, endangered, or candidate species federally-listed for Victoria County.

The shrubland habitat areas are primarily small, fragmented tracts. The observable quality of this habitat ranges from low to moderate. The shrubland habitats observed within the Action Area did not have characteristics to support any of the threatened, endangered, or candidate species federally-listed for Victoria County.

The riparian habitats include streams and rivers including Spring Creek, Dry Creek, Wright Creek, Court Branch, and the Guadalupe River. Based on the historic aerial photography and windshield survey, this habitat has historically been impacted by agricultural and urban development. The observable quality of this habitat ranges from low to high. These habitats do not possess characteristics with the potential to support most of the federally-listed species. The riparian habitats have characteristics with the potential to support golden orbs and Texas pimplebacks. Portions of Wright Creek have few characteristics with the potential to support interior least terns. These habitats have characteristics with the potential to support Sprague's pipits. This potential is analyzed more specifically in Section 9.7.

8.0 AIR QUALITY ANALYSIS

RPS completed detailed pollutant emission calculations for the proposed project in connection with its PSD review[9] and GHG permit[43]. Table 1(a) (Appendix G) is the Emission Point Summary provided in the application that Victoria submitted to the TCEQ for a permit to authorize non-GHG emissions for the expansion project.

Additionally, RPS performed dispersion modeling of the proposed emissions of air pollutants from the proposed project to support the BA. This section provides the results and evaluation of the dispersion modeling.

8.1 AIR DISPERSION MODELING RESULTS

An AOI analysis was conducted as part of the required State NAAQS review for the emissions of NO_2, CO, and PM/PM_{10}/$PM_{2.5}$. In addition, a health effects evaluation was performed for other emissions from the proposed project using TCEQ ESLs[44].

The predicted emissions were compared to the SILs for all NAAQS constituents[45]. A SIL is a concentration, established by the EPA, below which the project emissions are considered to have no significant contribution to the total ambient air quality concentration. If the GLCmax predicted by the modeling of the project emissions is below the SIL, no further analysis is required for the pollutant and averaging period. If the predicted project GLCmax is above the SIL, further analysis is typically necessary to demonstrate that the project will not cause or contribute to the exceedance of an applicable standard. Air pollution standards are shown in Table 4[46].

Table 4. Standards for Comparison with Modeling for Criteria Pollutants

Pollutant	Regulation	Averaging Period	Significant Impact Level (µg/m³)	Standard (µg/m³)
SO2	NAAQS	1-hr	7.8	196
		3-hr	25	1300
		24-hr	5	365
		Annual	1	80
NO2	NAAQS	1-hr	7.5	188
		Annual	1	100
CO	NAAQS	1-hr	2000	40,000
		8-hr	500	10,000
PM10	NAAQS	24-hr	5	150
		Annual	1	50
PM2.5	NAAQS	24-hr	1.2	35
		Annual	0.3	12

8.1.1 CRITERIA POLLUTANT DISPERSION MODELING RESULTS AND EVALUATION

Table 5 shows the maximum predicted off-property GLCmax from the proposed project for each pollutant and averaging period.

Table 5. Maximum Predicted Criteria Pollutant Concentrations

Pollutant	Averaging Period	Project GLCmax[2] (µg/m3)	SIL (µg/m3)	Monitoring De minimis (µg/m3)	Less Than SIL?	Background Conc. (µg/m3)	Maximum Total Conc. (µg/m3)	NAAQS (µg/m3)
NO_2	1-hour[(1)(2)]	47.86	7.5	NA	No	37.7	TBD	188
	Annual[(3)]	0.37	1	14	Yes	NA	NA	100
CO	1-hour	497.15	2000	NA	Yes	NA	NA	40,000
	8-hour	324.71	500	575	Yes	NA	NA	10,000
PM_{10}	24-hour	8.15	5	10	No	45	TBD	150
	Annual	0.67	1	NA	Yes	NA	NA	50
$PM_{2.5}$	24-hour[(2)]	1.82	1.2[(4)]	4	No	21.27	TBD	35
	Annual	0.16	0.3[(4)]	NA	Yes	NA	NA	12
SO_2	1-hour[(2)]	6.65	7.8	NA	Yes	NA	NA	196
	3-hour	6.89	25	NA	Yes	NA	NA	1,300
	24-hour	3.66	5	13	Yes	NA	NA	365
	Annual	0.04	1	NA	Yes	NA	NA	80

1 - Value includes the ambient ratio method default value of 0.8 to allow for conversion of NO_x to NO_2.
2 - The number presented is the highest 5-year average of the maximum modeled concentrations predicted each year at each receptor, which is consistent with EPA guidance.
3 - Value includes the ambient ratio method default value of 0.75 to allow for conversion of NO_x to NO_2.
4 - Most stringent proposed significant impact limit in 40 Code of Federal Regulations 52.21(k).
5 - The number presented is the high-first-high of the maximum modeled concentrations.
6 – TBD= To be determined. Total concentration will be determined and provided upon receipt of modeling emissions inventory from TCEQ. The conclusions in this report are not dependent upon these results as no threatened or endangered species habitat was identified within the Action Area.

Nine of the predicted project GLCmax values are less than the SILs applicable to the following NAAQS: 1-Hour SO_2, 3-Hour SO_2, 24-Hour SO_2, annual SO_2, 1-Hour CO, 8-Hour CO, annual $PM_{2.5}$, annual PM_{10}, annual NO_2. Accordingly, these predicted criteria pollutant emissions are considered insignificant based on EPA's SIL analysis method with screening levels set to protect sensitive populations. Therefore, GLCmax values less than the SILs are not expected to impact federally-listed species and will be excluded from further analysis.

Projected impacts for the following three out of twelve pollutants and averaging periods are greater than the designated SIL: 24-Hour $PM_{2.5}$, 24-Hour PM_{10}, and 1-Hour NO_2. For these pollutants and averaging periods, the full dispersion modeling analysis required by the TCEQ/PSD air permit must demonstrate that the Project emissions combined with existing emissions in the area do not result in an exceedance of the applicable NAAQS or PSD increment. At the time of submittal of this BA, the full dispersion modeling analysis has not been completed due to technical problems with the TCEQ software used to retrieve the required

emissions information from the TCEQ database. This BA will be supplemented with the final modeling results when the analysis is completed.

The dispersion model conducted by RPS predicts concentrations at specific downwind receptor locations for each pollutant and averaging period. The coordinates of each receptor with modeled concentrations greater than the SIL for each pollutant were plotted to delineate the area of significant impact (AOI). Note: The significant AOIs do not infer that the maximum concentration predicted for each pollutant averaging period will reach each location for each emission. The furthest distance in any direction from the project emissions sources to concentrations above the SIL for these pollutants was determined to be approximately 6.7 miles.

8.1.2 NON-CRITERIA POLLUTANTS MODELING RESULTS AND EVALUATION

In addition to the air quality analysis performed for criteria pollutants, RPS assessed the emissions increases for other pollutants associated with the project and performed air dispersion modeling for only those constituents that were found to be necessary.

A comparison of the modeled concentrations of H_2SO_4, ammonia, and formaldehyde to the TCEQ established ESLs is shown in Table 6. Based on these results, the maximum predicted concentrations of the modeled pollutant are well below their respective ESL[44].

Table 6. Non-Criteria Pollutant Modeling Results

Compound	CAS	Averaging Period	Model Results		
			ESL/State Property Line (µg/m³)	Project GLCmax (µg/m³)	ESL %*
H_2SO_4	7664-93-9	1-Hour	50	1.2	2.4
		24-Hour	15	0.57	3.8
Formaldehyde	50-00-0	1-Hour	15	0.14	0.9
		Annual	3.3	0.01	0.2
Ammonia	7664-41-7	1-Hour	170	56.79	33.4
		Annual	17	0.56	3.3

*If project impact is less than 10% of ESL, then it is insignificant and no further analysis is required.

9.0 EFFECTS OF THE PROPOSED ACTION

This section presents the results of the analysis of potential effects on federally-listed species as a result of the proposed expansion project. The following potential effects sources are included in the analysis: air quality, water quality, noise pollution, infrastructure-related disturbance, human-related disturbance, and federally-listed species effects. This analysis is based on total emissions and dispersion modeling data provided by RPS, field survey and background review data collected by WGI, and literature review and research of potential effects of known pollutants on flora and fauna.

9.1 AIR EMISSIONS EFFECTS BACKGROUND RESEARCH

Resources were searched extensively for data, documentation, or research regarding the potential effects of NO_2, PM, and SO_2 (criteria pollutants with potential depositional impacts to flora and fauna) on flora and fauna. WGI biologists also specifically searched for information regarding concentrations and length of time of exposure at which flora and/or fauna are impacted. Additional research included, but was not limited to, documentation of long-term and short-term exposure to airborne pollutants, accumulation of pollutants in surface water, accumulation of pollutants in various ecosystems and habitat types, the potential for pollutants to affect vegetation composition, and potential impacts to the food chain. Information regarding the general impacts airborne pollutants can have on a variety of ecosystems is included. However, very little information was located regarding specific concentrations at which potential effects occur on a long-term or short-term basis. A list of research resources is available upon request.

Air emissions effects vary greatly between regions due to differences in biota, climate, geochemistry, and hydrology. Therefore, the estimation of potential impacts on flora and fauna is highly variable and dependent upon site-specific conditions[47].

According to a publication focused on the effects of air emissions on biodiversity, in general, air emissions have a greater impact on lower life forms than higher life forms. Lower life forms that would likely be the first to be impacted would include lichens, bryophytes, fungi, and soft-bodied aquatic invertebrates. Impacts to adult higher life forms are typically the result of secondary impacts to the food chain and reproduction, with the exception of extreme exposure. Potential secondary impacts include acidification, changes in food or nutrient supply, or changes to biodiversity and competition. In general, plant communities are less adaptable to

changes in air quality than animals. Animals typically have the ability to migrate away from unfavorable conditions. Lower order animals, such as amphibians and fish, are known to be impacted by acidification as a result of the subsequent release of metals into water[48].

Nitrogen Dioxide and Sulfur Dioxide

According to the EPA's Integrated Science Assessment (ISA) for Oxides of Nitrogen and Sulfur, sufficient evidence is present to demonstrate a causal relationship between deposition of nitrogen and sulfur, acidification, and effects on biogeochemistry related to terrestrial and aquatic ecosystems and to biota in these systems. The Nature Conservancy and the Institute of Ecosystem Studies have published 2 documents that describe the known effects of airborne nitrogen, sulfur, and other airborne pollutants on various ecosystems in the eastern US. Airborne NO_2 and SO_2 are known to be converted into acid particles or acid precipitation. Both forms are deposited onto soils, vegetation, and surface waters[49,50].

The potential effects of airborne sulfur dioxide on flora are acute. The sulfur dioxide gas is absorbed into the leaves and causes reducing conditions, which is toxic when the gas concentration exceeds the capacity of the tissue. The toxic conditions kill the local plant cells. The limiting concentration is similar for many diverse species, including aquatics. Generally, significant concentrations of SO_2 gas can be added to plant systems before toxicity occurs. Depending of the extent of injury, uninjured tissue maintains or regains function and develops normally[51].

The potential effects of airborne NO_2 and SO_2 on terrestrial ecosystems are generally long-term effects as opposed to short-term effects. Many soils are buffered against acid inputs and biodiversity changes are not immediately evident for vegetation species with a longer lifespan. The deposition of sulfur can result in sulfate leaching, which can cause acidification of soils and surface waters as well as the release of calcium, and magnesium. The deposition of nitrogen can result in nitrate leaching, which can cause acidification of soils and surface waters as well as the release of aluminum, calcium, and magnesium[50]. Arthropods with high-calcium needs are some of the animals inhabiting the soil that can be impacted by soil acidification. The release of aluminum into soil water can harm plant roots. The leaching of aluminum into surface waters can be toxic to aquatic plants, fish, and other aquatic organisms[49]. The accumulation of nitrogen can impact plant species competition, thereby impacting plant species composition. Nitrogen accumulation can also lead to nitrogen saturation, which impacts microorganisms, plant

production, and nitrogen cycling[50,52]. Additional potential terrestrial ecosystem effects include reduced forest productivity and increased vulnerability to pests and pathogens[50].

The potential effects of airborne NO_2 and SO_2 on aquatic ecosystems include acidification and eutrophication. The effects of acidification on water quality, whether introduced by direct acid deposition or leaching from adjacent terrestrial ecosystems, include increased acidity, reduced acid neutralization capacity, hypoxia, and mobilization of aluminum[50]. Stream and lake acidification can be chronic or episodic and both can be damaging. In general, larger aquatic ecosystems have a greater buffering capacity than smaller systems. Increased acidity can reduce dissolved organic carbon and increase light penetration and visibility through the water column. Increased light penetration can result in increased macrophyte and algal growth. Increased visibility can alter the predator-prey balance. Low alkalinity waters are more susceptible to adverse effects from acidification. A pH value of 6.0 is often considered the level below which biota are at risk from acidification. Biological effects are primarily attributable to a combination of low pH and high inorganic aluminum concentration (between 2.0 and 7.5 micromoles per liter). Eutrophication is the over enrichment of nutrients into an aquatic system, which can result in excess algal growth. The decomposition of the excess algae can result in a decrease in dissolved oxygen, which can be harmful to fish and other aquatic organisms. Wetlands, estuaries, bays, and salt marshes are generally less impaired by acid deposition than other aquatic ecosystems. However, in estuarine ecosystems, nitrogen from atmospheric and non-atmospheric sources contributes to increased phytoplankton and algal productivity, leading to eutrophication. Estuary eutrophication is an ecological problem indicated by water quality deterioration, resulting in numerous adverse effects including hypoxic zones, species mortality, and harmful algal blooms. Increased sulfur concentrations can increase the production of specific bacteria, which can convert inorganic mercury to methyl-mercury, especially in wetlands. Methyl-mercury does not appear to impact flora, but is toxic to fauna[50]. Methyl-mercury is a powerful toxin that can bioaccumulate to toxic amounts in food webs at higher trophic levels (e.g. bass, perch, otters, or kingfishers).

Particulate Matter

PM is a mixture of airborne particles resulting from fossil fuel combustion or a breakdown of crustal matter, and residual water soluble materials after evaporation of water from aqueous aerosols. The atmosphere can also transform VOC, NO_2, and SO_2 into PM. PM is a broad term referring to an assortment of particles that vary in their formation, chemical properties, size, mass, toxicity, and atmospheric reactivity. The EPA characterizes PM by their size: PM10

(particles equal to and less than 10 microns in aerodynamic diameter), $PM_{2.5}$ (fine particles that are 2.5 microns or less in diameter), $PM_{10-2.5}$ (coarse particles with a diameter between 2.5 and 10 microns), and ultrafine particles (diameter less than 0.1 microns).

Fine particles can remain in the atmosphere for days to weeks and travel through the atmosphere hundreds to thousands of kilometers, while most coarse particles typically deposit to the earth within minutes to hours and within tens of kilometers from the emission source. The potential effects of dispersed particles on aquatic ecosystems include acidification, eutrophication, and impacts to ecosystem diversity[53]. The potential effects of dispersed particles on terrestrial ecosystems include nutrient depletion in soils and damage to crops and sensitive plant species[53]. PM is also responsible for the creation of haze (i.e. reduced visibility) and has been linked to physiological effects, such as respiratory and cardiovascular dysfunctions[54,55]. Other documented adverse effects included the blinding and/or death of cattle by smoke (i.e. PM) and the occurrence of fluorosis, a teeth and bone disease, when exposed to atmospheric fluoride[56]. Mortality of birds and a decrease in nesting has been linked to sulfur dioxide, known to be capable of transforming into PM. In addition, a recent study has shown that exposure to PM can affect the genetics of an individual thus resulting in unknown long term effects[57]. Limited research is available about threshold limit values (e.g. the maximum amount of exposure without adverse effects) on sensitive wildlife populations[55,58].

9.2 AIR QUALITY EFFECTS

9.2.1 EMISSIONS

RPS completed detailed pollutant emission calculations for the expansion project in accordance with the Air Permit Application requirements. A summary of the total proposed annual emissions of each pollutant that would be emitted by the project are provided in Table 1(a) (Appendix G).

RPS also performed dispersion modeling of the emissions of air pollutants from the proposed Victoria Power Station project in accordance with the PSD Permit requirements. The results of the modeling are provided as a summary of the maximum predicted concentrations in Table 7 (Section 7.2.2).

Victoria will utilize the best available control technology to control emissions from the project and thus minimize impacts to the surrounding environment to the maximum extent practicable.

The proposed emissions limits of each constituent are consistent with both the TCEQ BACT guidance and the limits in the RBLC; and, are considered to be the top level of control available for the proposed facility upgrades.

Emissions resulting from gasoline and diesel-fueled vehicles and equipment during construction and maintenance are considered negligible. The project will not require a significant increase in vehicle and equipment use.

9.2.2 FUGITIVE DUST

Dust will be emitted during the construction phase of the project. This emission will be minimal and temporary. Dust emissions are expected to be negligible after the site work activities are completed.

9.2.3 IMPACTS OF AIR POLLUTION SOURCES ON FLORA AND FAUNA

The current secondary NAAQS provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. Air pollution effects vary greatly between regions due to differences in biota, climate, geochemistry, and hydrology. Because of this variation, models were developed by the EPA and were based on ecosystems that are considered the most sensitive to nitrogen and/or sulfur deposition effects. For more information regarding these case studies and analysis, refer to the EPA's Risk and Exposure Assessment for Review of the Secondary National Ambient Air Quality Standards for Oxides of Nitrogen and Oxides of Sulfur[59]. For the purposes of this BA, the most conservative and appropriate information was used to analyze potential impacts within the project area.

There is sufficient evidence to infer a causal link between nitrogen/sulfur deposition and the resulting acidification and its effects on biota[60]. The data presented in Table 6 below is taken directly from EPA's ISA for Oxides of Nitrogen and Sulfur detailing select exposure rates and related ecological effects. Nitrogen and sulfur deposition may adversely affect aquatic and terrestrial nutrient balances, acidification, availability of methyl mercury, and net primary production. This may result in declines in species fitness and richness, changes in species competition, increased susceptibility to stress/disease, habitat degradation, alterations to fire regimes, etc.

Table 7. Relationships Between Deposition Levels and Ecological Effects[59]

Kg Nitrogen/Hectare/Year	Ecological Effect
~1.5	Altered diatom communities in high elevation freshwater lakes and elevated nitrogen in tree leaf tissue high elevation forests in the western US
3.1	Decline of some lichen species in the western US
4	Altered growth and coverage of alpine plant species in the western US
5	Onset of decline of species richness in grasslands of the US and United Kingdom
5.5 - 10	Onset of nitrate leaching in Eastern forests of the US
5-10	Multiple effects in tundra, bogs, and freshwater lakes in Europe
5-15	Multiple effects in arctic, alpine, subalpine and scrub habitats in Europe

The current secondary NAAQS were largely based on the data and models presented in the EPA's ISA and Risk and Assessment publication seeking to minimize these impacts. Since SILs are concentrations that represent thresholds of insignificant modeled source impacts, the pollutant concentrations predicted to be less than or equal to the SILs are expected to have no significant impact on flora or fauna.

The dispersion model predicts concentrations above the SILs at locations outside of the Victoria Power Station for specific pollutants and averaging periods. The coordinates of each receptor with modeled concentrations greater than the SIL for each pollutant were plotted to delineate the AOI. Significant AOIs (represented by a blue dot) are shown on Figures 1-6 (Appendix B). Note: The significant AOIs do not infer that the maximum concentration predicted for each pollutant and averaging period will occur at all locations. Further, the significant AOIs do not infer a frequency of occurrence, but rather a potential location of "significant impact" pollutant concentration.

The significant AOIs located the farthest distance from the source in all directions were plotted to create a mAOI (theoretical) boundary. The furthest distance in any direction from the project emissions sources to concentrations above the SIL for these pollutants was determined to be 6.7 miles. This mAOI boundary was used to define a portion of the Action Area for the BA.

The mAOI boundary encompasses the Project Area and the wastewater and stormwater discharge locations. Therefore, the Action Area for the BA was defined as the mAOI boundary Figures 2-5 (Appendix A). None of the habitat types present within the action is expected to be routinely used by federally threatened or endangered species. No adverse effect to threatened or endangered species or their habitat is anticipated from air emissions from the proposed project.

9.3 WATER QUALITY EFFECTS

9.3.1 WASTEWATER AND STORMWATER

Erosion and sedimentation controls will be utilized to protect water quality during the construction and operation of the proposed project. Erosion and sedimentation controls filter sediment and some pollutants from stormwater. Erosion and sedimentation controls also minimize erosion and slow the flow of stormwater, which allows additional time for water to reach ambient temperature and for sediment to settle out of the water column. Since erosion and sedimentation controls will be utilized to protect water quality, no effects to federally-listed species are anticipated as a result of non-contact, non-point source stormwater from the proposed project. Victoria will follow procedures as prescribed in the SWPPP for construction (to be developed).

The Victoria Power Station has an existing TPDES permit (TPDES Permit No. WQ0001165000). The proposed project would produce an estimated 13-20 gpm additional wastewater and does not require an amendment to the existing TPDES permitted limit of 112 gpm. There will be minimal loss of raw water to evaporation.

Raw water at the Victoria Power Station is utilized primarily for steam and cooling purposes. As such, it is not subject to significant pollutants within the facility before it is discharged into the Guadalupe River. A water flow diagram has been provided in Appendix C. Per the TPDES permit conditions, the wastewater effluent is monitored regularly.

Wastewater and stormwater from the new facilities would be discharged primarily at Outfall 001, but minor amounts could be discharged from Outfall 002. Outfall locations are demonstrated in Figure 2 (Appendix A).

Since the existing facility does not currently discharge wastewater and stormwater effluent with significant constituents or temperature, the additional 13-20 gpm of similar wastewater effluent would not likely adversely affect federally-listed species.

9.4 NOISE EFFECTS

Project engineers estimate that noise levels during operation should be comparable to noise levels from maintenance activities that currently take place at the existing Victoria Power Station facility.

No noise effects to wildlife are expected as a result of the infrastructure construction of the expansion project.

9.5 INFRASTRUCTURE-RELATED EFFECTS

The proposed Project Area consists of maintained bermudagrass and gravel. No federally-listed species habitat was observed in Project Area. The Project Area is located within the whooping crane migration corridor (Figure 6 – Appendix A). The potential for occurrence of whooping cranes within the Action Area is described in Section 9.7. The potential for whooping crane collision with new infrastructure was considered in the analysis. Whooping cranes are known to avoid existing, well-lit infrastructure and human disturbance[69]. The Project Area has historically been utilized as a power station and has existing high-energy transmission lines. No changes to the existing transmission lines are anticipated for the project. Generator leads to connect the added generator to the existing substation will be required but this will be limited in scope and confined to the project area. The project is being constructed in an established industrial area, which previously had legacy infrastructure, consisting of three conventionally fired boilers with stacks installed up to 199 feet in height. This legacy infrastructure, including the stacks, has been deconstructed and removed from the site, which will result in a significant net decrease in potential for whooping crane collision after the addition of the new unit. New infrastructure associated with the proposed project will be the same approximate height as the current infrastructure, but will consist of only a single stack installed up to 150 feet. No other towers, flares, powerlines, or fencelines are proposed for this project. The new infrastructure will be well lit and fitted with safety lighting similar to the previous and existing infrastructure and in accordance with the Federal Aviation Administration and USFWS guidelines[70]. In addition, flags will be attached to the boom of construction cranes (maximum 230 feet tall) to

increase visibility. Federal Aviation Administration lighting will be included on crane booms 200 feet high and higher.

Given the location of the site, pre-existing surrounding industrial development, and known whooping crane locations, it is unlikely new infrastructure poses a risk to migrating whooping cranes. Although whooping cranes have not been observed at or near the facility, measures have been implemented to reduce the likelihood of any potential impacts in the event that they do occur. No infrastructure-related effects to whooping cranes or other federally-listed species are anticipated as a result of the proposed project.

9.6 HUMAN ACTIVITY EFFECTS

Construction and operation of the proposed expansion project will not require significant additional human activity compared to typical maintenance activities that occur at the plant on a regular basis.

No additional effects to federally-listed species are expected as a result of the increase in human activity associated with the proposed project.

9.7 FEDERALLY-LISTED SPECIES EFFECTS

9.7.1 FEDERALLY-LISTED THREATENED AND ENDANGERED SPECIES

9.7.1.1 Attwater's Greater Prairie Chicken

Potential to Occur in the Action Area

Attwater's greater prairie chicken populations have declined primarily due to habitat loss from agriculture and urban development. In fact, they have declined to such an extent that they are currently only known in Goliad, Colorado, and Galveston Counties, Texas, where coastal prairie grasslands are still found[61]. Despite repeated surveys, Attwater's greater prairie chickens have not been located outside of these protected areas[62]. Records from 1985 and 1986 show that Attwater's greater prairie chickens were present in Victoria County, however land alterations have extirpated this species from the area[42]. Specifically, the surrounding area around the proposed project has been subject to conversion into agriculture and urban development, thus it is unlikely to provide suitable habitat for this listed species.

No habitat with the potential to support the Attwater's greater prairie chicken was observed within the Project Area, proposed pipeline corridor, or Action Area. Given the extreme rarity of Attwater's greater prairie-chickens and lack of suitable habitat, these birds would not likely occur within the Action Area.

Potential Effects to Attwater's Greater Prairie Chicken

Since the Project Areas and proposed pipeline are located within a developed area, the Attwater's greater prairie chicken will not be directly impacted by construction activities associated with the completion of the proposed project, noise pollution, or human disturbance. Since the existing facility does not currently discharge wastewater and stormwater effluent with significant constituents or temperature and the current discharge is monitored in accordance with the existing TPDES permit, the additional 13-20 gpm of similar wastewater effluent would not likely impact the Attwater's greater prairie chicken.

Since the Attwater's greater prairie chicken is unlikely to occur within the air emissions mAOI and the concentration of emissions within the mAOI would be low and infrequent, no impacts to these birds are anticipated from the project's criteria pollutant air emissions. Since the predicted non-criteria pollutant routine and Maintenance, Startup, and Shutdown (MSS) emissions concentrations are below TCEQ guideline levels and no emissions of mercury or other heavy metals are anticipated, no impacts to the prairie chicken are anticipated from the project's non-criteria pollutant air emissions.

No direct or indirect impacts to Attwater's greater prairie chickens are anticipated.

Determination of Effect

The proposed action is anticipated to have no effect on Attwater's greater prairie chickens.

9.7.1.2 Interior Least Tern

Potential to Occur in the Project Area

The interior least tern is migratory and breeds on major inland rivers of the U.S that are more natural and less disturbed/altered. Nesting habitat loosely includes vegetation-free sand or gravel islands, sand banks, gravel bars, and beaches. Nest sites cannot be inundated during nesting. Nest sites have also included industrial sites, dredge spoil locations, sand pits, created habitats, and rooftops. Key nesting criteria include: no flooding or inundation during nesting

activity period, less than 30% vegetation cover, distance of greater than 250 feet from trees or vegetation suitable to hide or support predators, and available prey[63]. In Texas, nesting habitats have typically been within or adjacent to large river systems, such as the Rio Grande River, the Canadian River, the Prairie Dog Town Fork of the Red River, and the Red River[30].

In the winter, interior least terns migrate to the coasts of Central and South America and along the Texas Gulf Coast. Very little is currently known about preferred wintering habitat characteristics, except wintering habitat includes marine coasts, bays and estuaries, and the mouths of major rivers[63]. The Project Area is located more than 20 miles from the nearest potential wintering habitat[64].

Sparsely vegetated bars or islands are sporadically present within and along the Guadalupe River in portions of the Action Area. The Guadalupe River is comparatively small compared to preferred river systems. This river also includes a prominent riparian buffer throughout the Action Area, which includes large trees and habitat to support and hide a variety of potential predators. The Guadalupe River is a maximum width of 170 feet within the Action Area. The river does offer foraging potential; however, least terns are known to forage within range of their nesting sites[63]. No potential suitable nesting sites were observed within the Action Area. Subsequently, interior least terns are unlikely to forage within the Action Area.

According to the TNDD, there are no records of interior least terns within Victoria County. According to the TNDD and the Audubon Society[65], there are no records of interior least terns within the Action Area. The nearest known record of interior least terns is approximately 40 miles to the southeast of the Project Area[65]. No potential habitat was observed within the Action Area; therefore, Interior least terns are unlikely to occur within the Action Area.

Potential Effects to Interior Least Tern

Since potential habitat was not observed within the Action Area, the interior least tern will not be impacted by construction activities associated with the completion of the proposed project, noise pollution, or human disturbance. Since the existing facility does not currently discharge wastewater and stormwater effluent with significant constituents or temperature and the current discharge is monitored in accordance with the existing TPDES permit, the additional 13-20 gpm of similar wastewater effluent would not likely impact the interior least tern.

Since the interior least tern is unlikely to occur within the air emissions mAOI and the concentration of emissions within the mAOI would be low and infrequent, no impacts to these

birds are anticipated from the project's criteria pollutant air emissions. Since the predicted non-criteria pollutant routine and MSS emissions concentrations are below TCEQ guideline levels and no emissions of mercury or other heavy metals are anticipated, no impacts to the least tern are anticipated from the project's non-criteria pollutant air emissions.

No direct or indirect impacts to interior least terns are anticipated.

Determination of Effect

The proposed action will have no effect on the interior least tern.

9.7.1.3 Whooping Crane

Potential to Occur in the Action Area

Whooping cranes are migratory birds and their breeding habitat is known to be in the northern US and Canada[31]. Therefore, the consideration of potential nesting habitat was excluded from this analysis. Their wintering habitat is known to be limited to the Aransas National Wildlife Refuge near Rockport, Texas (approximately 33 miles southeast of project area), and few other coastal counties[42]. Therefore, the consideration of potential wintering habitat was excluded from this analysis. Potential habitat within the Action Area would be limited to temporary foraging and roosting habitat during migration. These cranes prefer to feed and roost in wetlands, rivers, and upland grain fields with other bird species[31].

Whooping cranes are a rare species in the wild. Only 245 individuals have been observed in Texas in 2012[66].

Habitat with the potential to support the whooping crane was not observed within the Project Area. The larger streams, small lakes, and corn fields observed within the Action Area have the potential to support migrating whooping cranes. The Project Area is located approximately 45 miles northeast of the Aransas National Wildlife Refuge and is within the designated migration corridor. However, whooping cranes have not been recorded and are not known to occur within or near the Action Area[67]. According to the National Audubon Society's Christmas Bird Count, no whooping cranes have been observed in the Action Area within the last 50 years[68]. The closest recorded observation of a whooping crane is approximately 30 miles to the northeast near Yorktown[67].

Potential Effects to Whooping Cranes

Whooping cranes are unlikely to occur within the Action Area. Since the Action Area is located in the migration corridor, the potential for whooping crane collision with new infrastructure was considered (Figure 6 – Appendix A).

Low light conditions may increase the potential for whooping crane collisions with new fencelines, new powerlines, or new tall and narrow infrastructure such as communication towers and extended crane booms. The majority of recorded collisions are associated with powerlines and fencelines[69]. No records of collisions with existing or preexisting facilities have been found. Further, whooping cranes are known to avoid buildings and human disturbance.

Although whooping cranes have not been observed at or near the facility, measures have been implemented to reduce the likelihood of any potential impacts in the event that they do occur. The project is being constructed in an established industrial area with existing infrastructure, consisting of a single stack, up to 150 feet in height. The Project Area has historically been utilized as a power station and previously had legacy infrastructure consisting of three conventionally fired boilers with stacks installed up to 199 feet in height. This legacy infrastructure, including the stacks has been deconstructed and removed including the stacks. The new infrastructure will be the same approximate height as the remaining s single stack, which is well lit. No other towers, flares, powerlines, or fencelines are proposed for this project. The new infrastructure will be fitted with safety lighting similar to the previous and existing infrastructure and in accordance with the Federal Aviation Administration and USFWS guidelines[70]. In addition, flags will be attached to the boom of construction cranes (maximum 180 feet tall) to increase visibility.

Since the existing facility does not currently discharge wastewater and stormwater effluent with significant constituents or temperature and the current discharge is monitored in accordance with the existing TPDES permit, the additional 13-20 gpm of similar wastewater effluent would not likely impact the whooping crane.

Since the whooping crane is unlikely to occur within the air emissions mAOI and the concentration of emissions within the mAOI would be low and infrequent, no impacts to these birds are anticipated from the project's criteria pollutant air emissions. Since the predicted non-criteria pollutant routine and MSS emissions concentrations are below TCEQ guideline levels

and no emissions of mercury or other heavy metals are anticipated, no impacts to the whooping crane are anticipated from the project's non-criteria pollutant air emissions.

No direct or indirect impacts to whooping cranes are anticipated.

Determination of Effect

Based on the location of the project within the whooping crane migration corridor, the proposed action may affect, but is not likely to adversely affect whooping cranes.

9.7.1.4 Red Wolf

Potential to Occur in the Action Area

Red wolves are a very rare species in the wild. Only 1 known population exists in the wild and is located in North Carolina[34]. Little information is available describing red wolf habitat characteristics.

Habitat with the potential to support the red wolf was not observed within the Project Area or Action Area. No known observations of the red wolf in or near the project area have been found.

Red wolves would not likely occur within the Action Area.

Potential Effects to Red Wolves

The red wolf will not be directly impacted by construction activities associated with the completion of the proposed project, noise pollution, or human disturbance. Since the existing facility does not currently discharge wastewater and stormwater effluent with significant constituents or temperature and the current discharge is monitored in accordance with the existing TPDES permit, the additional 13-20 gpm of similar wastewater effluent would not likely impact the red wolf.

Since the red wolf is unlikely to occur within the air emissions mAOI and the concentration of emissions within the mAOI would be low and infrequent, no impacts to red wolves are anticipated from the project's criteria pollutant air emissions. Since the predicted non-criteria pollutant routine and MSS emissions concentrations are below TCEQ guideline levels and no

emissions of mercury or other heavy metals are anticipated, no impacts to the red wolf are anticipated from the project's non-criteria pollutant air emissions.

No direct or indirect impacts to red wolves are anticipated.

Determination of Effect

The proposed action will have no effect on the red wolf.

9.7.1.5 Louisiana Black Bear

Potential to Occur in the Action Area

Louisiana black bears typically inhabit bottomland hardwood forests. Other habitat types the Louisiana black bear utilizes include brackish and freshwater marshes, salt domes, and agricultural fields. These bears require large, remote tracts of land with minimal human disturbance[37].

No habitat with the potential to support the Louisiana black bear was observed within the Project Area.

Although some characteristics of the woodland habitat type meet the qualifications for Louisiana black bear habitat, these woodlands are not large enough and are frequently subject to human disturbance. These woodlands would not likely support the Louisiana black bear. The USFWS-designated critical habitat for the Louisiana black bear is located in 15 counties in Louisiana[26]. No known observations of the Louisiana black bear in or near the Action Area have been found.

Louisiana black bears would not likely occur within the Action Area.

Potential Effects to Louisiana Black Bears

The Louisiana black bear will not be directly impacted by construction activities associated with the completion of the proposed project, noise pollution, or human disturbance. Since the existing facility does not currently discharge wastewater and stormwater effluent with significant constituents or temperature and the current discharge is monitored in accordance with the existing TPDES permit, the additional 13-20 gpm of similar wastewater effluent would not likely impact the Louisiana black bear.

Since the Louisiana black bear is unlikely to occur within the air emissions mAOI and the concentration of emissions within the mAOI would be low and infrequent, no impacts to these black bears are anticipated from the project's criteria pollutant air emissions. Since the predicted non-criteria pollutant routine and MSS emissions concentrations are below TCEQ guideline levels and no emissions of mercury or other heavy metals are anticipated, no impacts to the Louisiana black bear are anticipated from the project's non-criteria pollutant air emissions.

No direct or indirect impacts to Louisiana black bears are anticipated.

Determination of Effect

The proposed action will have no effect on Louisiana black bears.

9.7.2 FEDERALLY-LISTED CANDIDATE SPECIES

9.7.2.1 Sprague's Pipit

Potential to Occur in the Action Area

Sprague's pipits are migratory birds and their breeding habitat is known to be the northern US and Canada[39]. Therefore, the consideration of potential nesting habitat was excluded from this analysis. Potential habitat within the Action Area would be limited to wintering habitat (foraging and roosting). Preferred foraging habitat includes undisturbed mid-grasslands with intermediate thickness[39].

No habitat with the potential to support the Sprague's pipit was observed within the existing facility's boundaries or within the proposed pipeline corridor.

Sprague's pipits are known to prefer undisturbed grasslands[39]. No undisturbed grasslands were identified within the Action Area; however, maintained pasturelands were present within the Action Area. USFWS-critical habitat is not yet designated for this species[26]. The closest recorded observation of a Sprague's pipit was near Coleto Creek Cooling Pond, approximately 12 miles west of the Project Area[71]. The potential exists for Sprague's pipits to utilize the riparian habitats, but this is not their preferred roosting habitat.

The pasturelands in the Action Area are routinely disturbed and offer non-native forage, which would deter Sprague's pipit from occurring in the area. Therefore, Sprague's pipits are unlikely to occur within the Action Area for this project.

Potential Effects to Sprague's Pipit

The Sprague's pipit will not be directly impacted by construction activities associated with the completion of the proposed project, noise pollution, or human disturbance. Since the existing facility does not currently discharge wastewater and stormwater effluent with significant constituents or temperature and the current discharge is monitored in accordance with the existing TPDES permit, the additional 13-20 gpm of similar wastewater effluent would not likely impact the Sprague's pipit.

Since the Sprague's pipit is unlikely to occur within the air emissions mAOI and the concentration of emissions within the mAOI would be low and infrequent, no impacts to these birds are anticipated from the project's criteria pollutant air emissions. Since the predicted non-criteria pollutant routine and MSS emissions concentrations are below TCEQ guideline levels and no emissions of mercury or other heavy metals are anticipated, no impacts to the pipit are anticipated from the project's non-criteria pollutant air emissions.

No direct or indirect impacts to Sprague's pipits are anticipated.

9.7.2.2 Golden Orb

Potential to Occur in the Action Area

The golden orb is endemic to nearly the entire lengths of the Guadalupe, San Antonio, and Nueces-Frio river basins in central Texas, including the Guadalupe, Medina, San Antonio, Frio, and Nueces Rivers and Cibolo Creek[40]. The golden orb is found almost exclusively in flowing waters of medium-sized rivers. The lower portion of the Guadalupe River basin (within 75 miles of the coast) currently harbors all four of the large, presumably reproducing populations of golden orb. It is found in substrates of firm mud, sand, and gravel and does not tolerate loose sand or silt[40].

The proposed project is located immediately adjacent to the Guadalupe River and is within 35 miles of the coast. Records indicate that golden orbs have been observed within the Action Area, approximately 2.4 river miles upstream of the Project Area[72]. Potential habitat was observed within the Guadalupe River adjacent to the Project Area. No habitat for the golden orb was identified within the Project Area or the proposed pipeline corridor.

Potential Effects to Golden Orbs

The golden orb will not be directly impacted by construction activities associated with the completion of the proposed project, noise pollution, or human disturbance.

Raw water at the Victoria Power Station is utilized primarily for steam and cooling purposes. As such, it is not subject to significant pollutants within the facility before it is discharged into the Guadalupe River. Per the TPDES permit conditions, the wastewater effluent is monitored regularly. Since the existing facility does not currently discharge wastewater and stormwater effluent with significant constituents or temperature and the current discharge is monitored in accordance with the existing TPDES permit, the additional 13-20 gpm of similar wastewater effluent would not likely impact the golden orb.

Since the concentration of emissions within the mAOI would be low and infrequent, no impacts to these mussels are anticipated from the project's criteria pollutant air emissions. Since the predicted non-criteria pollutant routine and MSS emissions concentrations are below TCEQ guideline levels and no emissions of mercury or other heavy metals are anticipated, no impacts to the golden orb are anticipated from the project's non-criteria pollutant air emissions.

No direct or indirect impacts to golden orbs are anticipated.

9.7.2.3 Texas Pimplebacks

Potential to Occur in the Action Area

Historically, the Texas pimpleback is endemic to the Colorado and Guadalupe-San Antonio River basins of central Texas. However, it has declined significantly range-wide and only 4 streams—the San Saba River, Concho River, Guadalupe River, and San Marcos River—are known to harbor persisting Texas pimpleback populations[41]. These populations are small and isolated. The Texas pimpleback occurs in moderately-sized rivers, usually in mud, sand, gravel, and cobble, and occasionally in gravel-filled cracks in bedrock slab bottoms. This species has not been found in water depths over 6.6 feet and it is assumed the species is intolerant to deep, slow velocity waters[41].

The proposed project is located immediately adjacent to the Guadalupe River. Outfall 001 and 002 discharge into the Guadalupe River immediately adjacent to the Project Area. The two existing outfalls are located on the outside of a bend in the river. This location offers deeper

pools and slower flow velocity. Texas pimplebacks prefer shallower and faster flow habitat characteristics than were observed adjacent to the existing outfalls. Texas pimplebacks are unlikely to occur within the wastewater plume. Potential habitat for Texas pimplebacks was observed in select portions of the Guadalupe River upstream and downstream of the Project Area and within the Action Area. No records indicated that Texas pimplebacks have been observed within the Action Area[72]. No habitat with the potential to support the Texas pimpleback was observed within the Project Area or the proposed pipeline corridor.

Potential Effects to Texas Pimplebacks

The Texas pimpleback will not be directly impacted by construction activities associated with the completion of the proposed project, noise pollution, or human disturbance.

Raw water at the Victoria Power Station is utilized primarily for steam and cooling purposes. As such, it is not subject to significant pollutants within the facility before it is discharged into the Guadalupe River. Per the TPDES permit conditions, the wastewater effluent is monitored regularly. Since the existing facility does not currently discharge wastewater and stormwater effluent with significant constituents or temperature and the current discharge is monitored in accordance with the existing TPDES permit, the additional 13-20 gpm of similar wastewater effluent would not likely impact the Texas pimpleback. In addition, stormwater and wastewater would likely reach ambient condition before it reached potential Texas pimpleback habitat.

Since the concentration of emissions within the mAOI would be low and infrequent, no impacts to these mussels are anticipated from the project's criteria pollutant air emissions. Since the predicted non-criteria pollutant routine and MSS emissions concentrations are below TCEQ guideline levels and no emissions of mercury or other heavy metals are anticipated, no impacts to the Texas pimpleback are anticipated from the project's non-criteria pollutant air emissions.

No direct or indirect impacts to Sprague's pipit Texas pimplebacks are anticipated.

10.0 CONCLUSIONS

This section is a summary of WGI's recommended determination of effect for all federally-listed species, a description of any interdependent and interrelated actions, and a description of any anticipated cumulative effects resulting from the proposed project.

10.1 DETERMINATION OF EFFECT

The recommended determinations of effect for all federally-listed threatened or endangered species with the potential to occur within Victoria County, Texas are summarized below in Table 8.

Table 8. Determination of Effect Summary

Federally-Listed Species	Determination of Effect
Attwater's Greater Prairie Chicken	No Effect
Interior Least Tern	No Effect
Whooping Crane	May Affect, Not Likely to Adversely Affect
Sprague's pipit	No Effect
Red Wolf	No Effect
Louisiana Black Bear	No Effect

10.2 INTERDEPENDENT AND INTERRELATED ACTIONS

The proposed project is limited to the installation of an additional natural gas-fired turbine and HRSG with duct burners within the existing plant footprint as outlined in Section 4.0. Other potential interrelated actions include: modifications to the existing cooling tower, addition of a chiller to existing and new units and the possible addition of a small substation to facilitate interconnection with the electric grid.

10.3 CUMULATIVE EFFECTS

The Project Area is located in an existing industrial facility that is primarily surrounded by residential, commercial, industrial, and agricultural development.

According to the EPA Region 6 air permits website, INVISTA S.A.R.L. proposes to modify the existing Victoria Plant approximately 8.2 miles south-southwest of the Victoria Power Station. No additional industrial projects have been identified near the Victoria Power Station Expansion project. Given the 8.2-mile distance between project areas, no significant cumulative effects are anticipated.

10.4 CONSERVATION MEASURES

The construction of the proposed Victoria Station Expansion Project will likely have no direct or indirect impact on federally-listed species habitat.

Victoria plans to utilize BACT for project control emissions thus minimizing impacts to the surrounding environment to the maximum extent practicable. The proposed emissions of each constituent subject to PSD review are consistent with both the TCEQ BACT guidance and the most stringent limit in the RBLC; and, are considered to be the top level of control available for the new and modified facilities.

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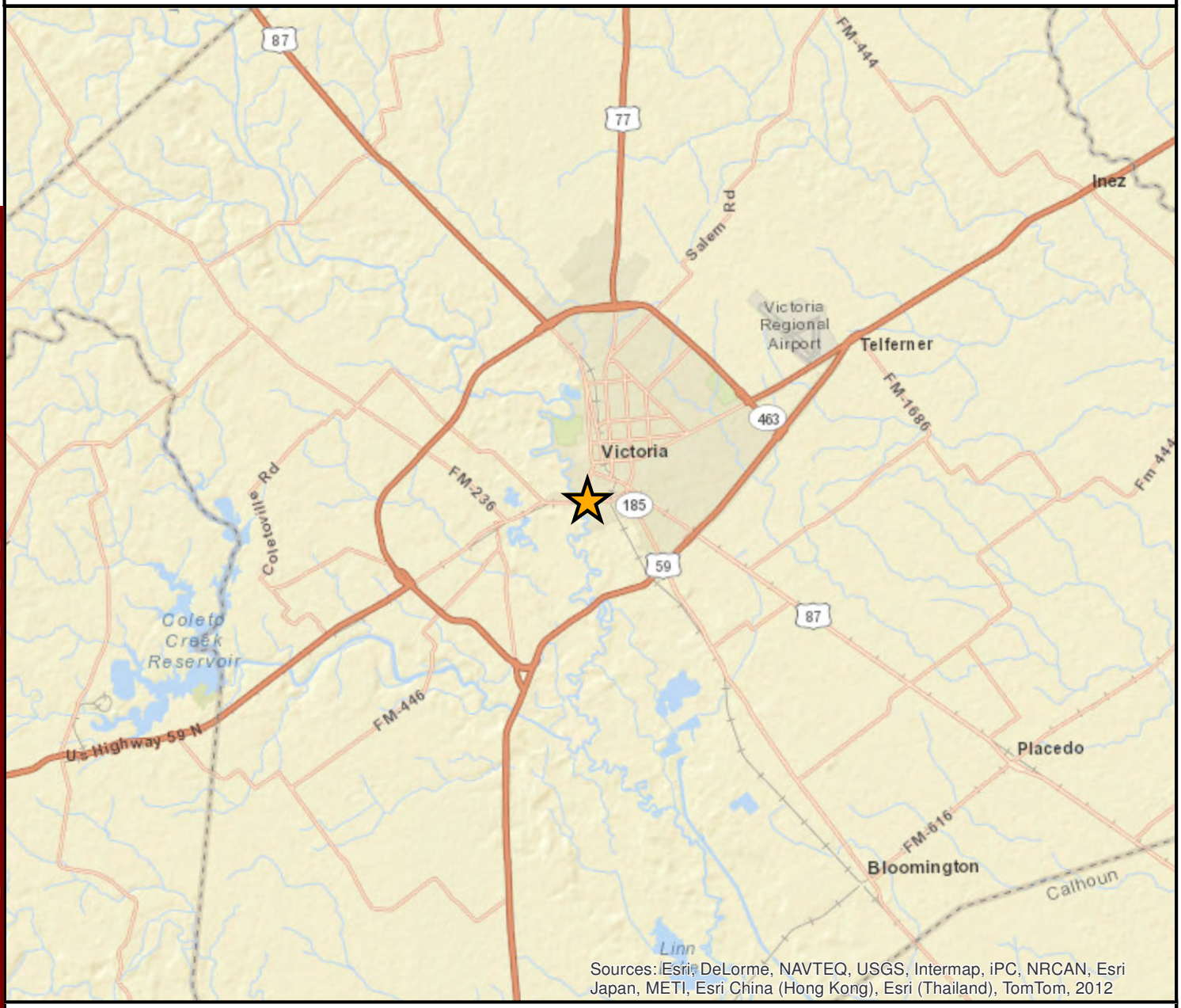
Donna Hertlein, Wildlife Biologist	M.S., Zoology and Ecology

APPENDIX A

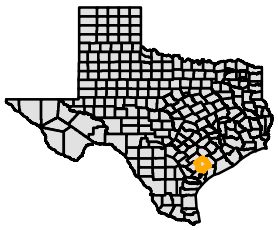
FIGURES

Figure 1
Project Location
Victoria Power Station Expansion Project
Victoria County, Texas



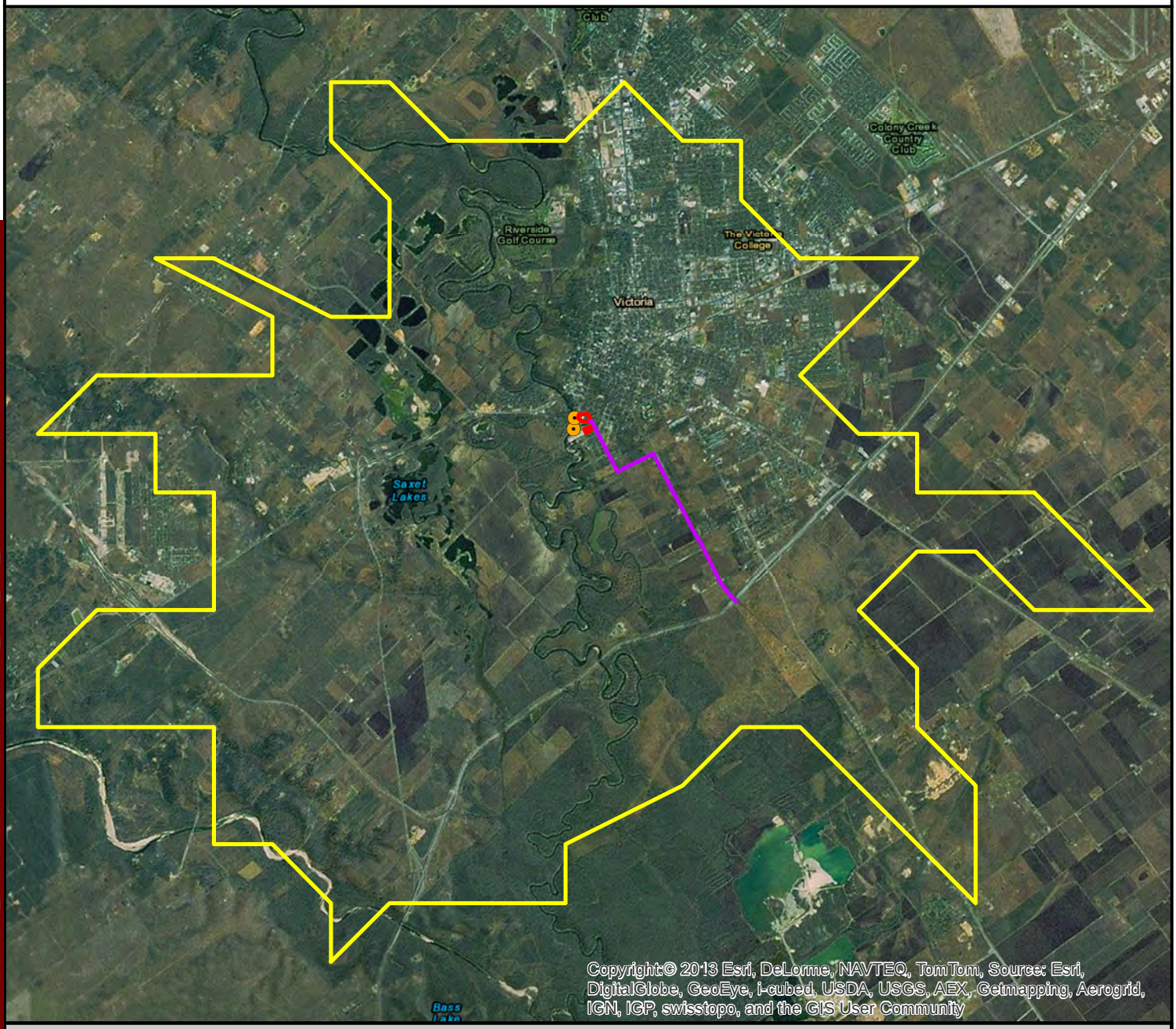
Victoria County

Project Location



Background Resources: ESRI World Street Map	Surveyor(s): Jayme Shiner PWS Scott Jecker CWB, PWS Debbie Scott AWB Bryan Whisenant	Project Number and Information: 1243 Victoria Power Station Expansion Project Biological Assessment	WHITENTON group environmental consultants 3413 Hunter Road San Marcos Texas 78666
GPS and Coordinate Type: Trimble Geo XH 6000 Series UTM NAD 1983 Zone 14 North	Map Created: 04/29/2013 by M. Pillion		Miles 0 3 6 N

Figure 2.1
Project and Action Areas
Victoria Power Station Expansion Project
Victoria County, Texas



Project Area (~7.4 Acres)

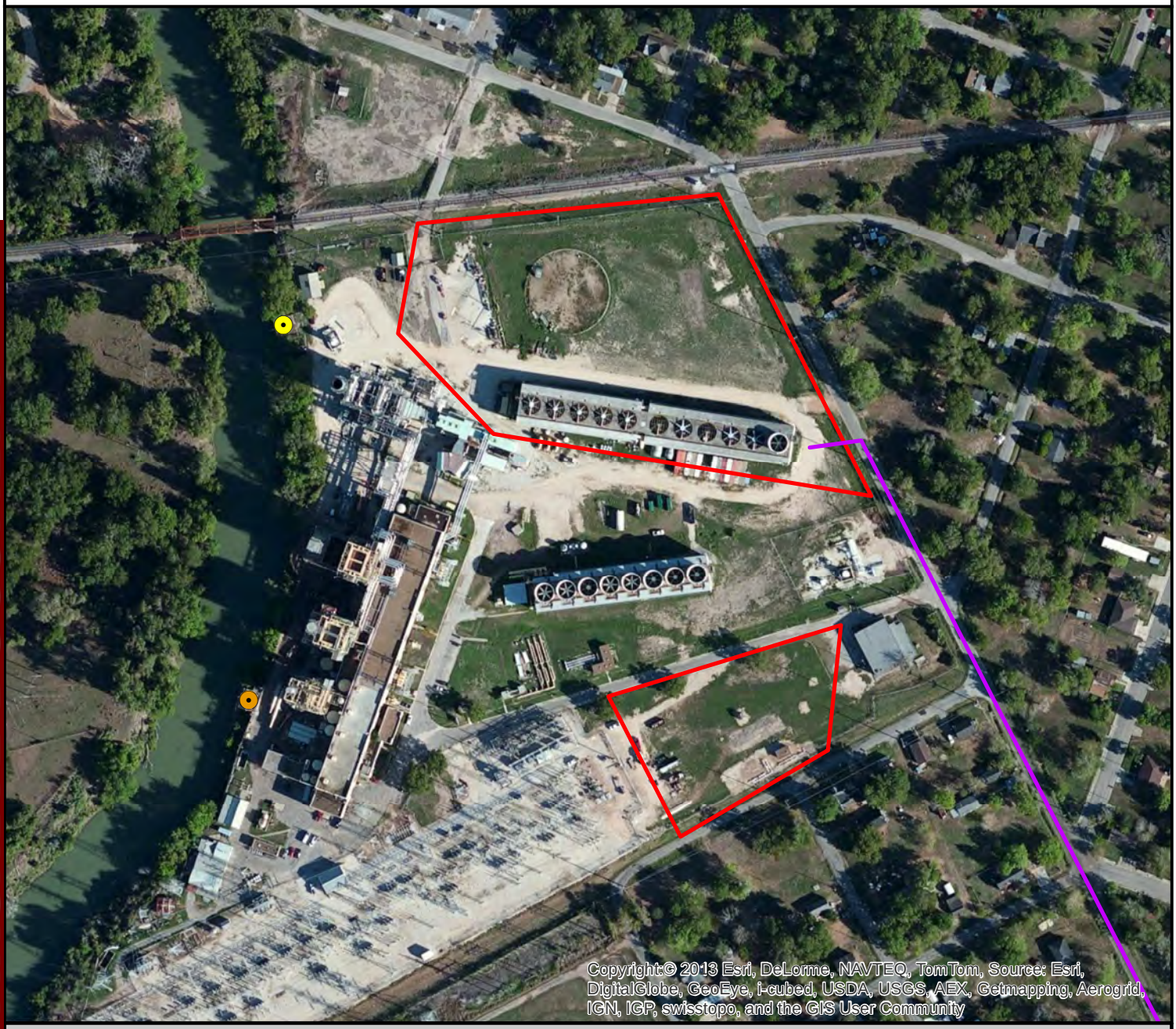
Action Area (~6.7 Mile Maximum Radius)

Existing Outfall

Proposed Natural Gas Pipeline (~2.85 Miles)

Background Resources: ESRI Aerial Imagery	Surveyor(s): Jayme Shiner PWS Scott Jecker CWB, PWS Debbie Scott AWB Bryan Whisenant	Project Number and Information: 1243 Victoria Power Station Expansion Project Biological Assessment	WHITENTON group environmental consultants 3413 Hunter Road San Marcos Texas 78666
GPS and Coordinate Type: Trimble Geo XH 6000 Series UTM NAD 1983 Zone 14 North	Map Created: 06/03/2013 by M. Pillion Revised 04/10/2014		Miles 0 1.5 3 N

Figure 2.2
Project Area and Wastewater Outfalls
Victoria Power Station Expansion Project
Victoria County, Texas



Project Area (~7.4 Acres)

Proposed Natural Gas Pipeline (~2.85 Miles Total)

Existing Outfall 001

Existing Outfall 002

Background Resources: ESRI Aerial Imagery	Surveyor(s): Jayme Shiner PWS Scott Jecker CWB, PWS Debbie Scott AWB Bryan Whisenant	Project Number and Information: 1243 Victoria Power Station Expansion Project Biological Assessment	WHITENTON group environmental consultants 3413 Hunter Road San Marcos Texas 78666
GPS and Coordinate Type: Trimble Geo XH 6000 Series UTM NAD 1983 Zone 14 North	Map Created: 06/03/2013 by M. Pillion Revised 04/10/2014		Feet 0 200 400 N

Figure 2.3
Project Area and Proposed Pipeline
Victoria Power Station Expansion Project
Victoria County, Texas

Project Area (~7.4 Acres)

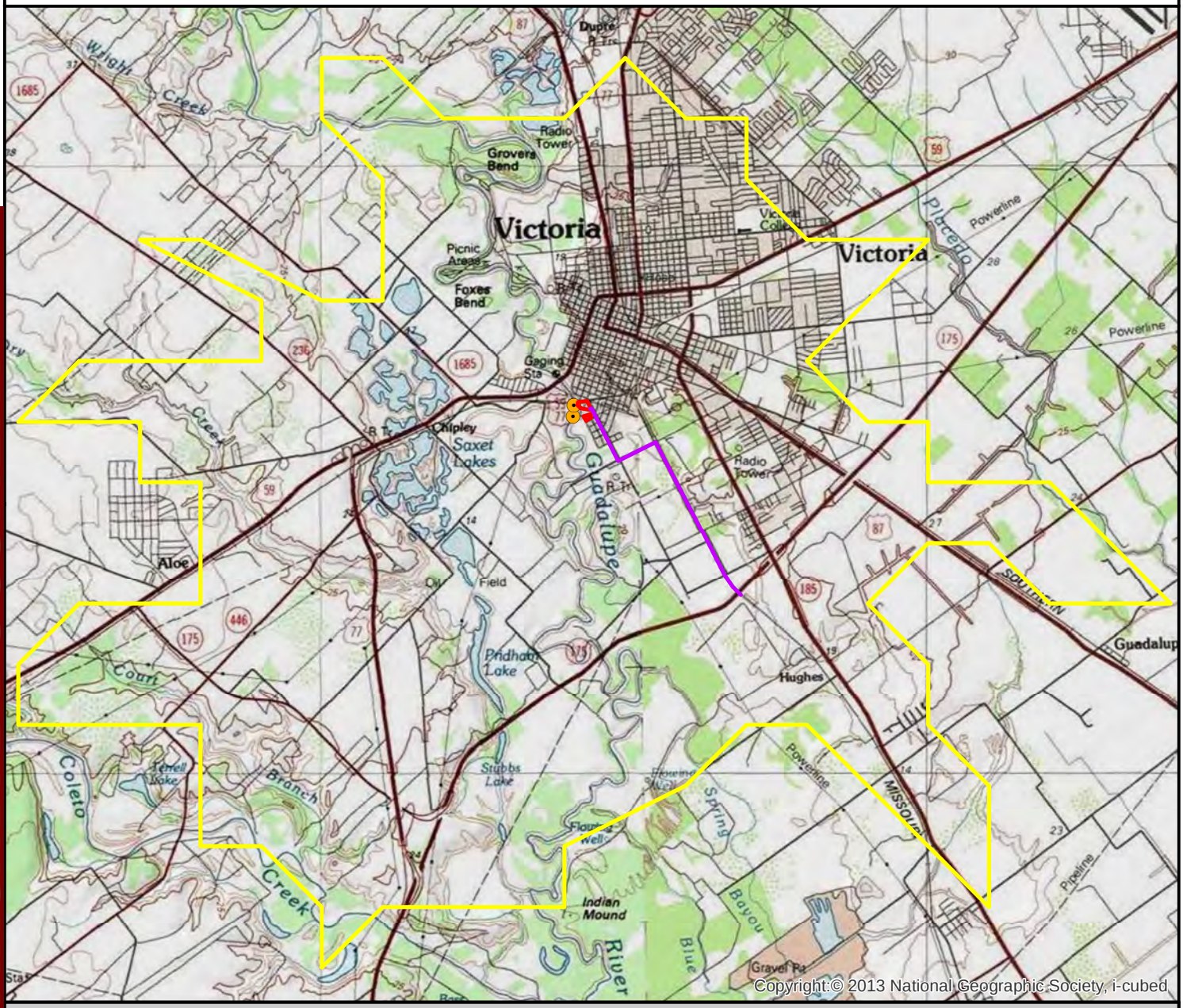
Proposed Natural Gas Pipeline (~2.85 Miles Total)

Existing Outfall 001

Existing Outfall 002

Background Resources: ESRI Aerial Imagery	Surveyor(s): Jayme Shiner PWS Scott Jecker CWB, PWS Debbie Scott AWB Bryan Whisenant	Project Number and Information: 1243 Victoria Power Station Expansion Project Biological Assessment	WHITENTON group environmental consultants 3413 Hunter Road San Marcos Texas 78666
GPS and Coordinate Type: Trimble Geo XH 6000 Series UTM NAD 1983 Zone 14 North	Map Created: 06/03/2013 by M. Pillion Revised 04/10/2014		Feet 0 1,500 3,000 N

Figure 3
Project Area and Action Area - Topographic Map
Victoria Power Station Expansion Project
Victoria County, Texas



Project Area (~7.4 Acres)

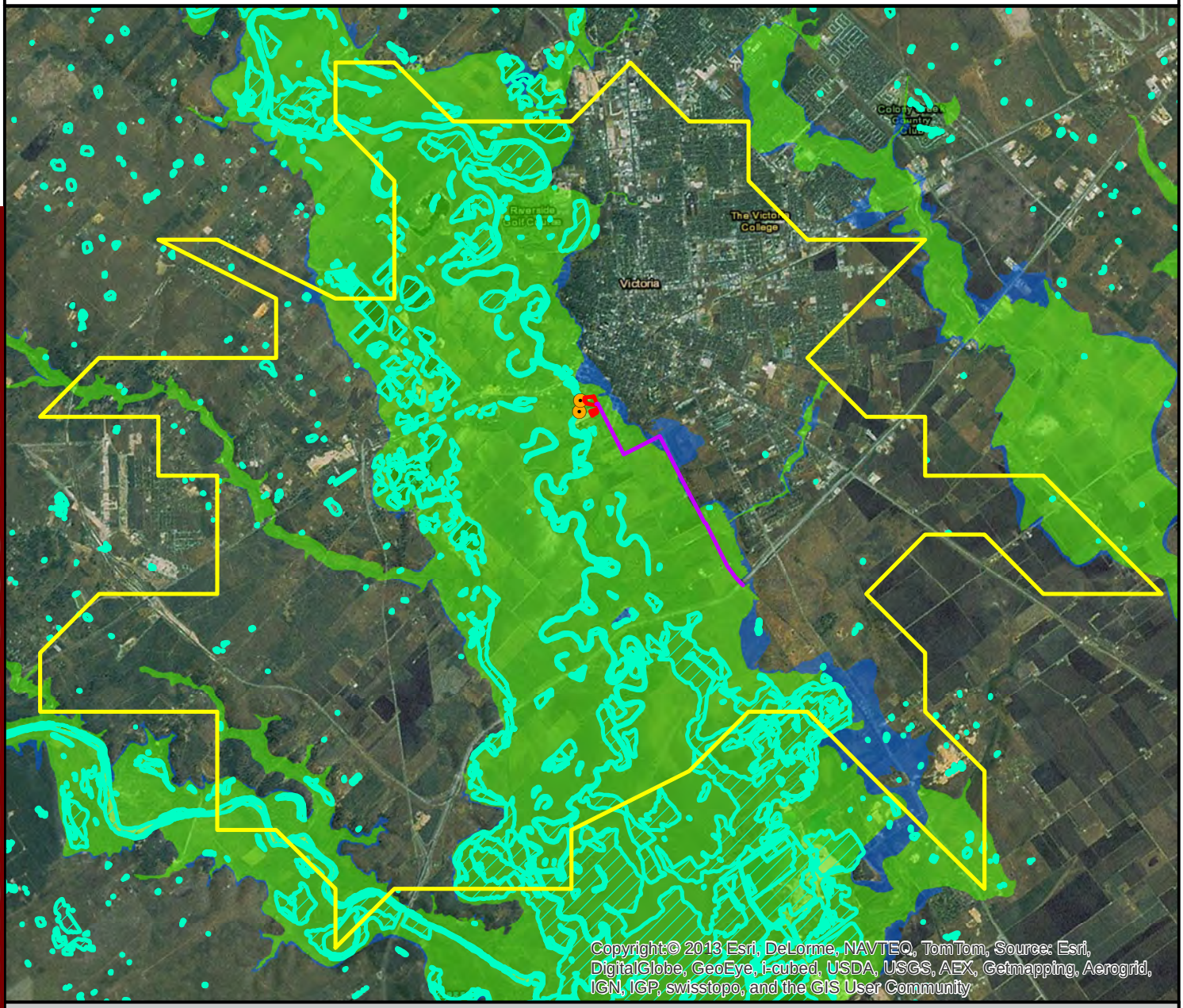
Action Area (~6.7 Mile Maximum Radius)

Existing Outfall

Proposed Natural Gas Pipeline (~2.85 Miles)

Background Resources: ESRI USA Topographic Maps	Surveyor(s): Jayme Shiner PWS Scott Jecker CWB, PWS Debbie Scott AWB Bryan Whisenant	Project Number and Information: 1243 Victoria Power Station Expansion Project Biological Assessment	WHITENTON group environmental consultants 3413 Hunter Road San Marcos Texas 78666
GPS and Coordinate Type: Trimble Geo XH 6000 Series UTM NAD 1983 Zone 14 North	Map Created: 04/29/2013 by M. Pillion Revised 04/10/2014		Miles 0 1.5 3 N

Figure 4
National Wetlands Inventory and FEMA Floodplain Data
Victoria Power Station Expansion Project
Victoria County, Texas



Project Area (~7.4 Acres)

Action Area (~6.7 Mile Maximum Radius)

Proposed Natural Gas Pipeline (~2.85 Miles)

100-Year Floodplain

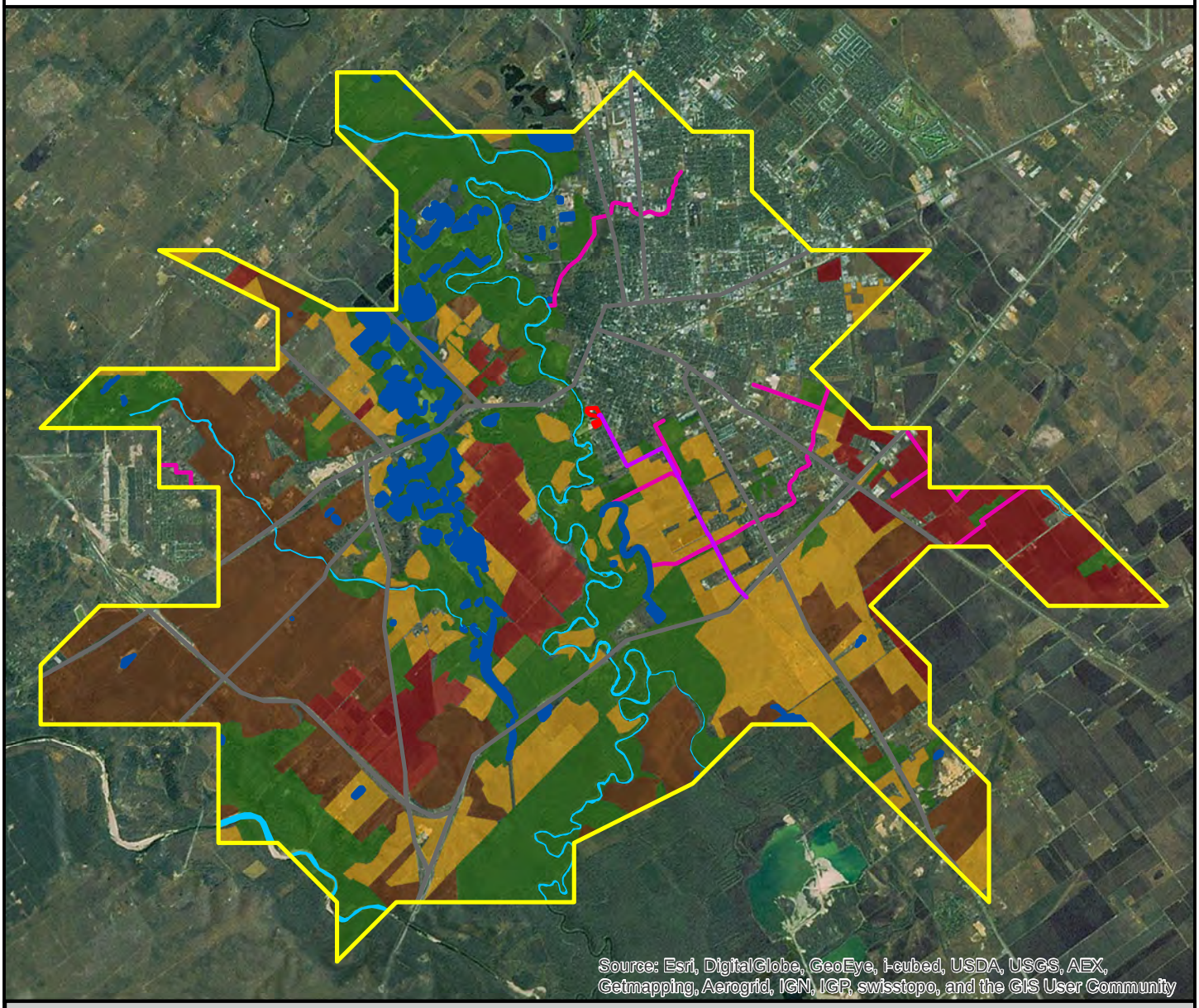
500-Year Floodplain

NWI Polygon

Existing Outfall

Background Resources: ESRI Aerial Imagery USFWS NWI Data FEMA 100-year Floodplain Data	Surveyor(s): Jayme Shiner PWS Scott Jecker CWB, PWS Debbie Scott AWB Bryan Whisenant	Project Number and Information: 1243 Victoria Power Station Expansion Project Biological Assessment	WHITENTON group environmental consultants 3413 Hunter Road San Marcos Texas 78666
GPS and Coordinate Type: Trimble Geo XH 6000 Series UTM NAD 1983 Zone 14 North	Map Created: 04/29/2013 by M. Pillion Revised 04/10/2014		Miles 0 1 2 N

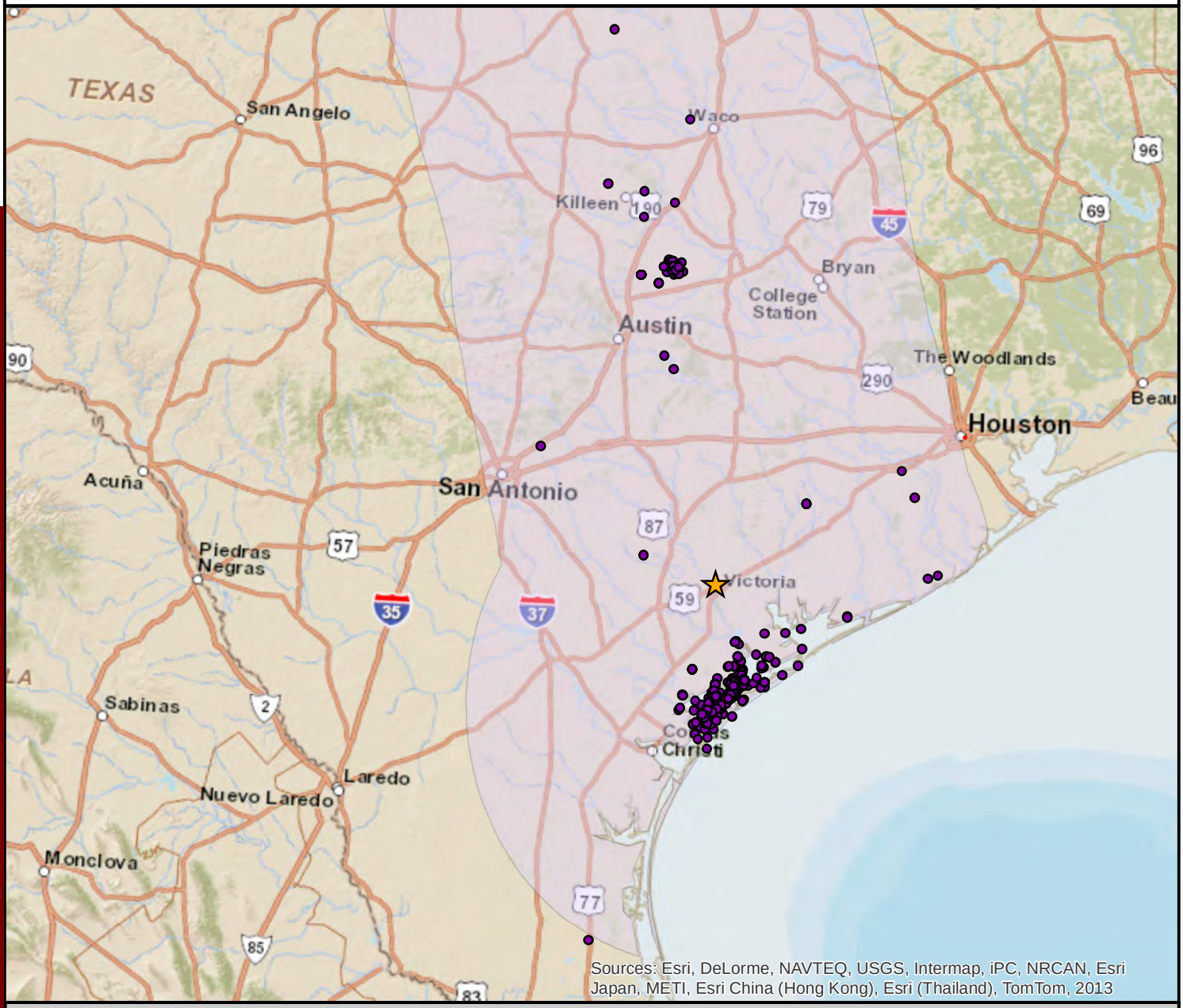
Figure 5
Observed Habitats
Victoria Power Station Expansion Project
Victoria County, Texas



Project Area
Action Area
Proposed Pipeline
Cropland
Woodland
Shrubland
Pastureland
Open Water
Riparian
Canal
Road

Background Resources: ESRI Bing Maps Hybrid	Surveyor(s): Scott Jecker PWS, CWB Jayme Shiner PWS Bryan Whisenant Debbie Scott	Project Number and Information: 1243 Victoria Power Station Expansion Biological Assessment	WHITENTON group environmental consultants 3413 Hunter Road San Marcos Texas 78666
GPS and Coordinate Type: Trimble Geo XH 6000 Series UTM NAD 1983 Zone 14 North	Map Created: 06/03/2013 by M. Pillion Revised 04/10/2014		Miles 0 1.5 3 N

Figure 6
Whooping Crane Data
Victoria Power Station Project
Victoria County, Texas



Project Location

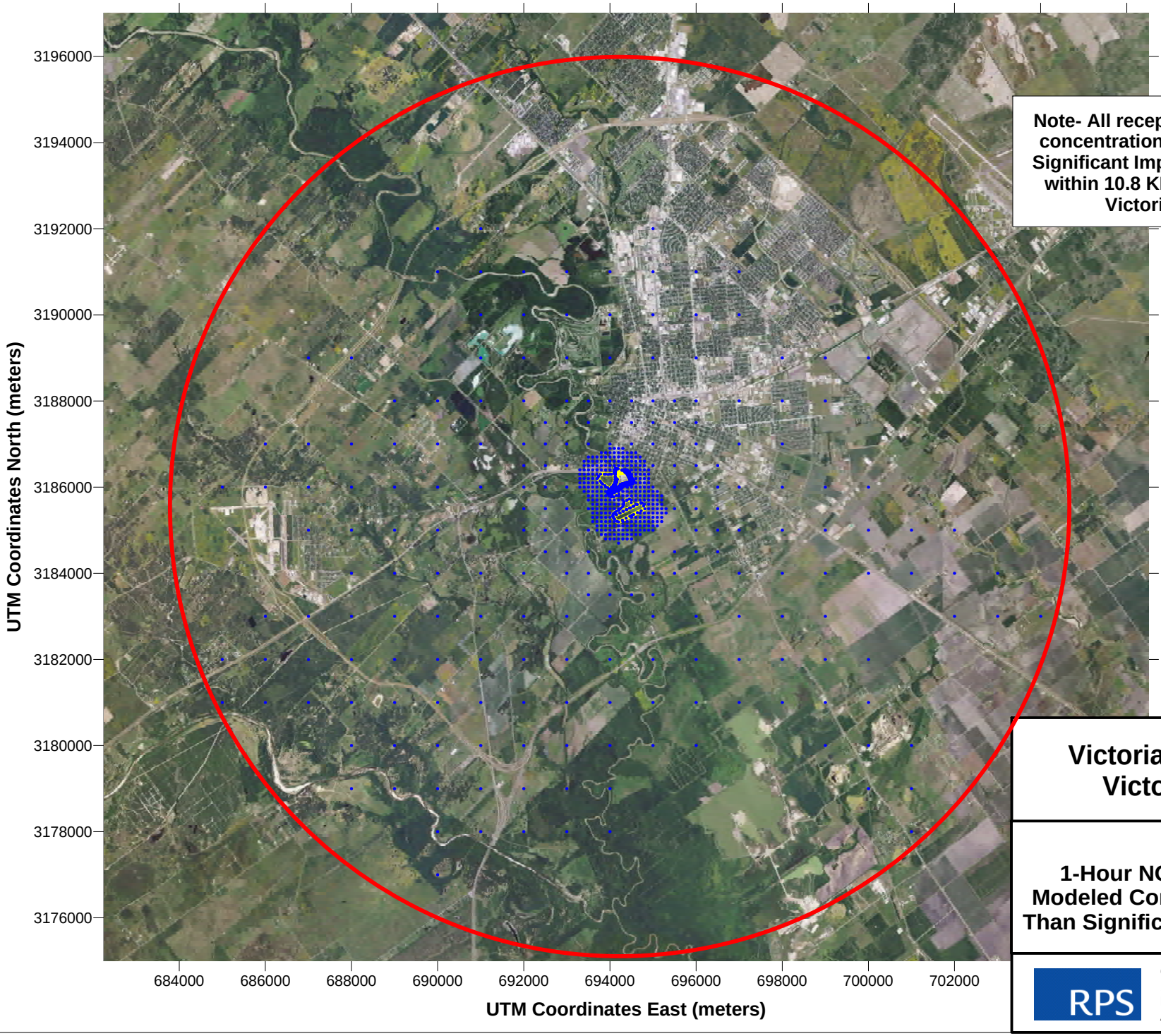
Whooping Crane Sightings

Whooping Crane Migration Corridor

Background Resources: ESRI Street Basemap	Surveyor(s): Jayme Shiner PWS Debbie Scott AWB Bryan Whisenant	Project Number and Information: 1352 Lon C. Hill Power Station Project Biological Assessment	WHITENTON group environmental consultants 3413 Hunter Road San Marcos Texas 78666
GPS and Coordinate Type: Trimble GEO XH 6000 Series UTM NAD 83 Zone 14 North	Map Created: 05/08/2014 by JAS		0 50 100 Miles

APPENDIX B

FIGURE 1 (RPS)



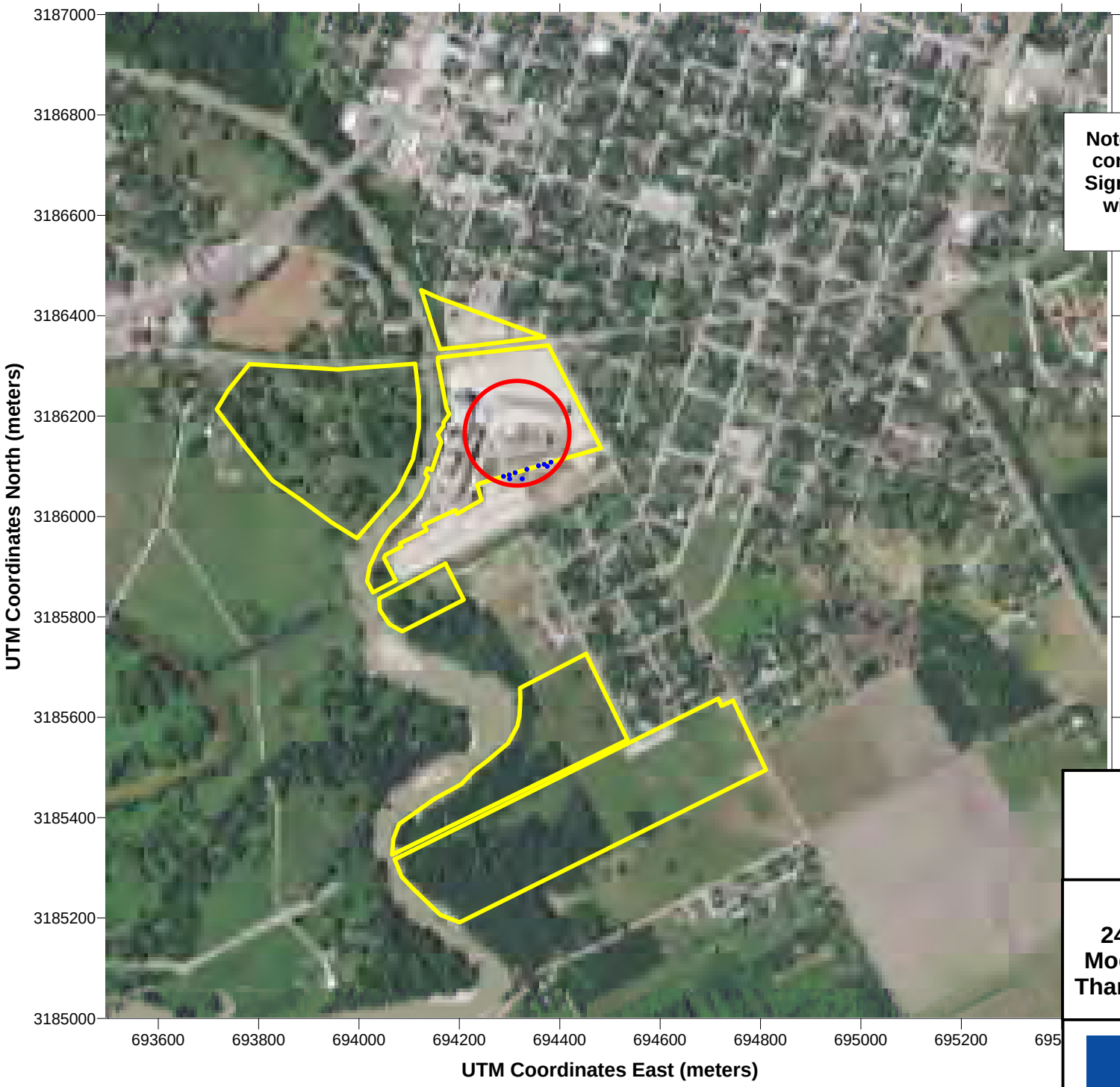
Note- All receptors with modeled concentrations greater than the Significant Impact Level (SIL) are within 10.8 KM of the center of Victoria WLE, LP

North

Victoria Power Station
Victoria WLE, LP

Figure 1
1-Hour NO2 Receptors with Modeled Concentrations Greater Than Significant Impact Level (SIL)

RPS
Cielo Center
1250 South Capital of Texas Highway
Building Three, Suite 200
Austin, Texas 78746, USA



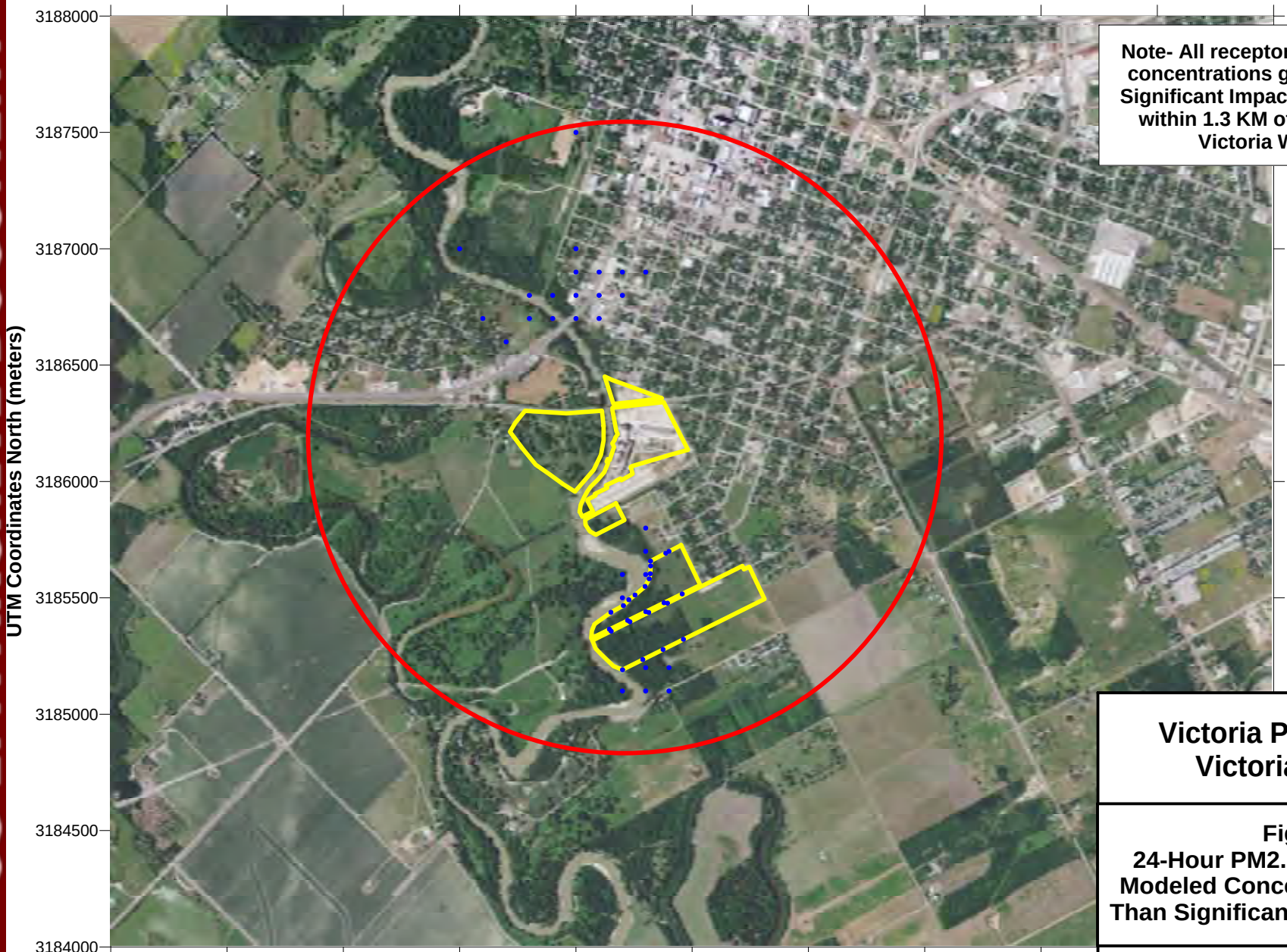
Note- All receptors with modeled concentrations greater than the Significant Impact Level (SIL) are within 0.2 KM of the center of Victoria WLE, LP

North

Victoria Power Station
Victoria WLE, LP

Figure 2
24-Hour PM10 Receptors with Modeled Concentrations Greater Than Significant Impact Level (SIL)

RPS
Cielo Center
1250 South Capital of Texas Highway
Building Three, Suite 200
Austin, Texas 78746, USA



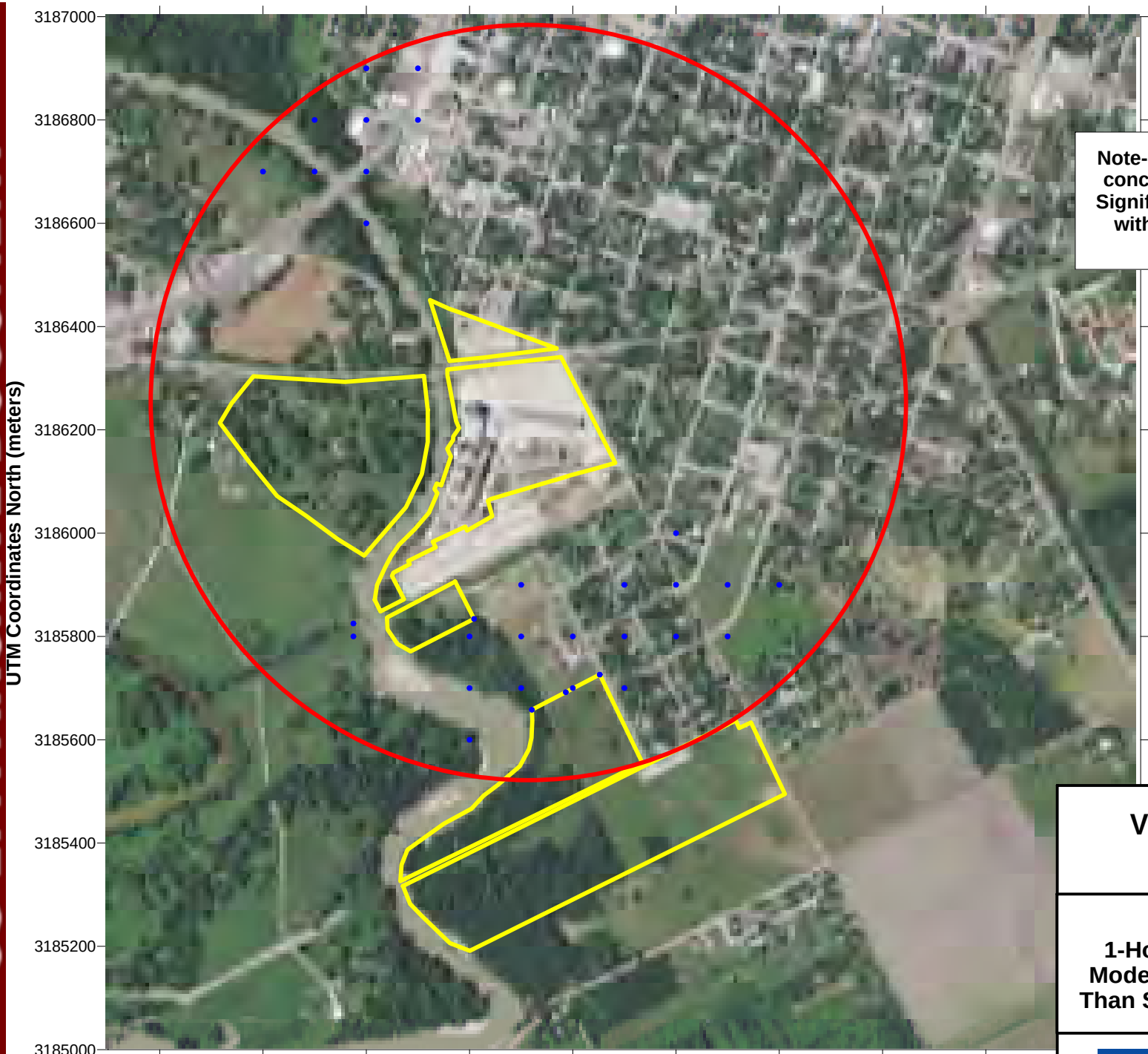
Note- All receptors with modeled concentrations greater than the Significant Impact Level (SIL) are within 1.3 KM of the center of Victoria WLE, LP

North

Victoria Power Station
Victoria WLE, LP

Figure 3
24-Hour PM2.5 Receptors with Modeled Concentrations Greater Than Significant Impact Level (SIL)

RPS
Cielo Center
1250 South Capital of Texas Highway
Building Three, Suite 200
Austin, Texas 78746, USA



Note- All receptors with modeled concentrations greater than the Significant Impact Level (SIL) are within 0.8 KM of the center of Victoria WLE, LP

North

Victoria Power Station
Victoria WLE, LP

Figure 4
1-Hour H2SO4 Receptors with Modeled Concentrations Greater Than Significant Impact Level (SIL)

RPS
Cielo Center
1250 South Capital of Texas Highway
Building Three, Suite 200
Austin, Texas 78746, USA

Note- All receptors with modeled concentrations greater than the Significant Impact Level (SIL) are within 1.3 KM of the center of Victoria WLE, LP

North

Victoria Power Station
Victoria WLE, LP

Figure 5
24-Hour H2SO4 Receptors with Modeled Concentrations Greater Than Significant Impact Level (SIL)

RPS
Cielo Center
1250 South Capital of Texas Highway
Building Three, Suite 200
Austin, Texas 78746, USA

Note- All receptors with modeled concentrations greater than 10% of the Effects Screening Level (ESL) are within 0.3 KM of the center of Victoria WLE, LP

North

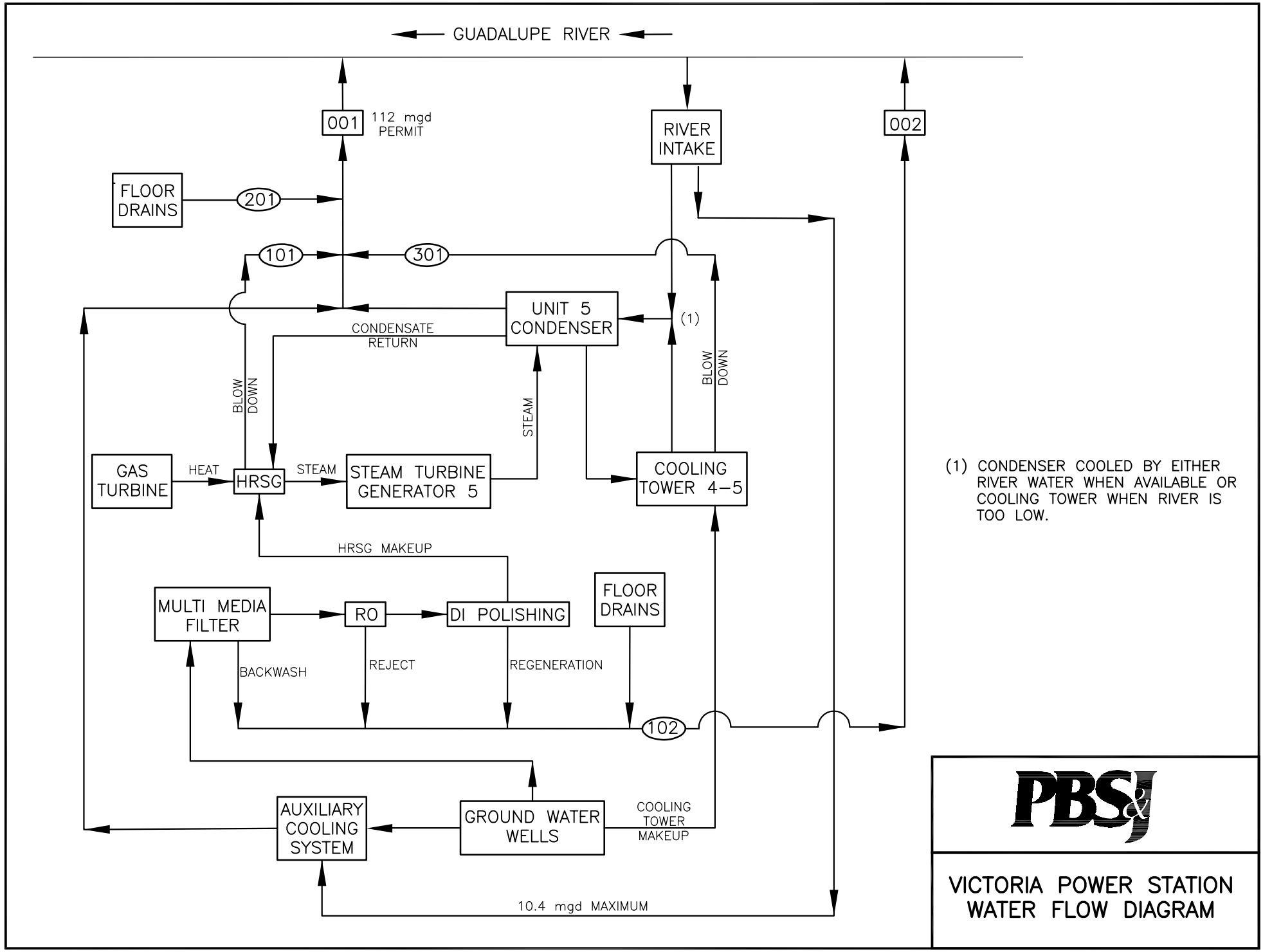
Victoria Power Station
Victoria WLE, LP

Figure 6
1-Hour NH3 Receptors with Modeled Concentrations Greater Than 10% of Effects Screening Level (ESL)

RPS
Cielo Center
1250 South Capital of Texas Highway
Building Three, Suite 200
Austin, Texas 78746, USA

APPENDIX C

FLOW DIAGRAMS



(1) CONDENSER COOLED BY EITHER RIVER WATER WHEN AVAILABLE OR COOLING TOWER WHEN RIVER IS TOO LOW.

PBS&J

VICTORIA POWER STATION
WATER FLOW DIAGRAM

reviewed 5/7/2013

APPENDIX D

TABLE 2

Table 2
NRCS Soils Data

NRCS Map Unit Symbol	NRCS Map Unit Name	NRCS Map Unit Characteristics	USDA Classification				NRCS Hydric Soil
			Depth	Drainage	Permeability	Landform	
DaA	Dacosta sandy clay loam	0 to 1 percent slopes	Deep and very deep	Moderately well drained	Very slow to moderately slow	Flats	No
DuB	Dacosta-Urban land complex	0 to 3 percent slopes	Deep and very deep	Moderately well drained	Very slow to moderately slow	Flats	No
EdA	Edna fine sandy loam	0 to 1 percent slopes	Deep and very deep	Somewhat poorly drained	Very slow to moderately slow	Flats	No
FoB	Fordtran loamy fine sand	0 to 3 percent slopes	Deep and very deep	Moderately well drained	Very slow to moderately slow	Terraces	No
KyC	Kuy loamy sand	0 to 5 percent slopes	Deep and very deep	Moderately well drained	Moderately rapid to rapid	Terraces	No
LaA	Laewest clay	0 to 1 percent slopes	Deep and very deep	Moderately well drained	Very slow to moderately slow	Flats	No
LaB	Laewest clay	1 to 3 percent slopes	Deep and very deep	Moderately well drained	Very slow to moderately slow	Flats	No
LaD	Laewest clay, eroded	3 to 8 percent slopes	Deep and very deep	Moderately well drained	Very slow to moderately slow	Flats	No
LcB	Laewest-Urban land complex	0 to 3 percent slopes	Deep and very deep	Moderately well drained	Very slow to moderately slow	Flats	No
Me	Meguin silty clay, occasionally flooded	0-1 percent slopes, occasionally flooded	Deep and very deep	Well drained	Moderately rapid to rapid	Depressions; Floodplains	No
Mf	Meguin silty clay	frequently flooded	Deep and very deep	Well drained	Moderately rapid to rapid	Floodplains	No

Pd	Pits and Dumps	-	-	Well drained	Moderately rapid to very rapid	-	-
RaB	Runge fine sandy loam	0 to 2 percent slopes	Moderately deep to very deep	Well drained	Moderately rapid to rapid	Interfluves	No
RaC	Runge fine sandy loam	2 to 5 percent slopes	Moderately deep to very deep	Well drained	Moderately rapid to rapid	Ridges, interfluves	No
SaB	Sarnosa loam	1 to 3 percent slopes	Deep and very deep	Well drained	Moderately rapid to rapid	Interfluves	No
Sn	Sinton loam	occasionally flooded	Deep and very deep	Well drained	Moderately rapid to rapid	Floodplains	No
TeA	Telferner fine sandy loam	0 to 1 percent slopes	Deep and very deep	Moderately well drained	Very slow to moderately slow	Meander scrolls	No
TeB	Telferner fine sandy loam	1 to 3 percent slopes	Deep and very deep	Moderately well drained	Very low to moderately low	Meander scrolls	No
TfB	Telferner-Urban land complex	0 to 3 percent slopes	Deep and very deep	Moderately well drained	Very slow to moderately slow	Meander scrolls	No
Tr	Trinity clay	frequently flooded	Deep and very deep	Moderately well drained	Very slow to moderately slow	Floodplains	Yes
W	Water	-	-	-	-	-	No
Za	Zalco fine sand	frequently flooded	Deep and very deep	Somewhat excessively drained	Rapid to very rapid	Floodplains	No

APPENDIX E

PHOTOGRAPHIC LOG

WHITENTON group environmental consultants

PHOTOGRAPHIC LOG 1

Victoria Power Station Expansion Project

07/25/2012

Victoria County, Texas

View: Southwest view of the proposed project area.

Victoria Power Station Expansion Project

07/25/2012

Victoria County, Texas

View: North aerial view of the forest, open water, and pastureland habitats.

Victoria Power Station Expansion Project

07/25/2012

Victoria County, Texas

View: Saxet Lakes west of the proposed project location.

WHITENTON group environmental consultants

PHOTOGRAPHIC LOG 2

Victoria Power Station Expansion Project

07/25/2012

Victoria County, Texas

View: West facing view of the proposed project location and adjacent residential and commercial development.

Victoria Power Station Expansion Project

07/25/2012

Victoria County, Texas

View: North view of the proposed location of the new gas turbine and heat recovery steam generator within the Project Area.

Victoria Power Station Expansion Project

07/25/2012

Victoria County, Texas

View: Northeast view of the east end of the proposed location of the new gas turbine and heat recovery steam generator and a proposed laydown area.

Victoria Power Station Expansion Project

07/25/2012

Victoria County, Texas

View: Northwest view of the Project Area. Cooling tower in view will be demolished.

Victoria Power Station Expansion Project

07/25/2012

Victoria County, Texas

View: Photograph of the existing outfall structure at the Guadalupe River.

Victoria Power Station Expansion Project

07/25/2012

Victoria County, Texas

View: Representative photograph of agriculture habitats adjacent to forest and riparian corridors.

Victoria Power Station Expansion Project

07/25/2012

Victoria County, Texas

View: Representative photograph of agriculture habitat adjacent to forest and riparian corridors.

Victoria Power Station Expansion Project

04/12/2013

Victoria County, Texas

View: Aerial view of pastureland with scattered shrubs (facing west).

Victoria Power Station Expansion Project

04/12/2013

Victoria County, Texas

View: Aerial view of the scrub-shrub habitat (facing south).

Victoria Power Station Expansion Project

04/12/2013

Victoria County, Texas

View: Aerial view of riparian habitat (facing south).

Victoria Power Station Expansion Project

04/12/2013

Victoria County, Texas

View: Aerial view of riparian habitat (facing south).

Victoria Power Station Expansion Project

04/12/2013

Victoria County, Texas

View: Aerial view of agricultural lands (facing east).

WHITENTON group environmental consultants

PHOTOGRAPHIC LOG 6

Victoria Power Station Expansion Project

04/12/2013

Victoria County, Texas

View: Aerial view of forest habitat (facing south).

Victoria Power Station Expansion Project

04/12/2013

Victoria County, Texas

View: Representative photograph of forest habitat (facing west).

Victoria Power Station Expansion Project

04/12/2013

Victoria County, Texas

View: Representative photograph of scrub-shrub habitat (facing north).

Victoria Power Station Expansion Project

04/12/2013

Victoria County, Texas

View: Representative photograph of maintained pastureland (facing northeast).

Victoria Power Station Expansion Project

04/12/2013

Victoria County, Texas

View: Representative photograph of forest habitat (facing southwest) and the adjacent proposed pipeline corridor.

Victoria Power Station Expansion Project

04/12/2013

Victoria County, Texas

View: Representative photograph of riparian habitat (facing west).

Victoria Power Station Expansion Project

04/12/2013

Victoria County, Texas

View: Representative photograph of corn fields (facing east).

Victoria Power Station Expansion Project

04/12/2013

Victoria County, Texas

View: East view of the Guadalupe River.

Victoria Power Station Expansion Project

04/12/2013

Victoria County, Texas

View: Representative photograph of the proposed pipeline corridor (facing southeast).

Victoria Power Station Expansion Project

04/12/2013

Victoria County, Texas

View: West (aerial) view of the proposed natural gas pipeline corridor.

Victoria Power Station Expansion Project

04/12/2013

Victoria County, Texas

View: North (aerial) view of the proposed natural gas pipeline corridor.

Victoria Power Station Expansion Project

04/12/2013

Victoria County, Texas

View: North (aerial) view of the proposed natural gas pipeline corridor.

APPENDIX F

FIELD DATA SUMMARY

WHITENTON group environmental consultants

25 July 2012

Surveyors: Scott Jecker, Bryan Whisenant, Cimagaroon Howell

Site inspection at the Victoria Power Station Expansion in Victoria County, TX.

The following notes for 25 July 2012 describe general habitat descriptions.

Conducted aerial survey of Project Site and surrounding 3-mile area. Flew in from the northwest at a safe altitude, but low enough to observe features. Circled clockwise twice. Observed habitat types, Guadalupe River, and land use not visible from public roadways. Photos taken. A sample of photos included below.

Landed and completed safety training and on-site pedestrian survey at the power plant.

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Habitat was industrial, mostly impacted. Natural habitat was mowed *Cynodon dactylon*.

Began windshield survey of areas surrounding the Victoria Power Station. Surveyed all publicly accessible, terrestrial areas within a 3-mile radius.

Headed northwest on S. Main St, west on Water St, and south on 77. Observed mostly residential and commercial development. As headed south on 77, observed the Guadalupe River, Saxet Lakes, riparian habitat, maintained pasturelands, scrub-shrub, agriculture (corn), and developed property. Photos taken.

Riparian: Dominant vegetation included *Celtis laevigata, Diospyros texana, Acacia farnesiana, Melia azedarach, Fraxinus pennsylvanica, Ambrosia trifida,Populus deltoides, Paspalum dilatatum, Sorghum halepense,* and *Cynodon dactylon.*

Pastureland: Vegatation-*Paspalum notatum, Cynodon dactylon, Sorghum halepense, Paspalum dilatatum, Bothriochloa ischaemum,* and *Helianthus annuus.*

Agriculture: corn and cotton

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Scrub-shrub: Dominant vegetation- *Acacia farnesiana, Parkinsonia texana*, and *Ulmus crassifolia*.

Back-tracked north on 77 turned west on 236. Observed pasturelands. Pastureland: Vegetation-As noted above.

Back-tracked on 236, headed north on 77, and then west on 1685. Observed Saxet Lakes and forest habitat.

Forest habitat: Dominant vegetation included *Celtis laevigata, Diospyros texana, Acacia farnesiana, Melia azedarach, Fraxinus pennsylvanica, Ambrosia trifida, Populus deltoides, Paspalum dilatatum, Sorghum halepense,* and *Cynodon dactylon.*

Turned north on Smith Road, east on River Road, south on Parsifal St, and north on 59/77. Observed pasturelands and croplands. Vegetation description same as above.

Went through town back to near plant, heading southeast on Bottom St. Observed maintained pastureland and croplands. Vegetation same as described above.

Headed south on 59. Observed woodlands, maintained pasturelands, and Guadalupe River. Vegetation as described above.

Back tracked on 59 north. Remaining area consisted of the City of Victoria (i.e. developed)

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WHITENTON group environmental consultants

12 April 2013

Surveyors: Jayme Shiner PWS, Debbie Scott, Bryan Whisenant

Surveyed the expanded action area by conducting aerial and windshield surveys. The following notes for 12 April 2013 describe general habitat descriptions. Conducted aerial survey first. Flew in from the northwest at a safe altitude, but low enough to observe features. Circled clockwise twice. Observed habitat types, Guadalupe River, Coletto Creek, and land use not visible from public roadways. Photos taken. A sample of photos included below.

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Landed and did a pedestrian survey of the expanded action area. Path taken: Began on north side of Victoria. Headed south on 77, southeast on 1685, back tracked on 77S, southeast on Beck Road, south on 236, west on 59S, back tracked on 59, east on 77S, south on 446, and back tracked to north on 59, east on 185, back tracked to 59, east on 87, north on 2615, west on Price Road, and south on Vogt Road. Observed habitats included scrub-shrub, pastureland, riparian, forest, and agriculture. Photos taken.

Scrub-shrub: Dominant vegetation-*Acacia farnesiana, Rosa bracteata, Sapindus saponaria var. drummondii, Ilex vomitoria, Smilax bona-nox,* and *Celtis laevigata.*

Pastureland: Dominant vegetation-*Paspalum notatum, Cynodon dactylon, Paspalum dilatatum, Bothriochloa ischaemum,* and *Helianthus annuus.*

Riparian: Dominant vegetation-*Salix nigra, Ambrosia trifida, Populus deltoides, Oenothera speciosa, Rubus trivialis, Rubus armeniacus,* and *Smilax cocculus.*

Forest: Dominant vegetation- *Celtis laevigata, Ulmus rubra, Aster sublatus, Robinia pseudoacacia, Diospyros texana,* and *Acacia farnesiana.*

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10 April 2014

Victoria proposes to construct a natural gas pipeline to serve as a secondary fuel option for the project. The preliminary pipeline corridor was included in our previous field survey efforts. The proposed pipeline is located within an existing, maintained road right-of-way. Photos of the proposed corridor are included below.

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APPENDIX G

EMISSIONS SUMMARY TABLE

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date:	February 2013	Permit No.:	TBD	Regulated Entity No.:	RN100214980
Area Name:	Victoria Power Station			Customer Reference No.:	CN602656548

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA					
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate	
(A) EPN	(B) FIN	(C) NAME		(A) POUND	(B) TPY
VIC10	VIC10	Unit 10 Combined Cycle (GE 7FA)	NOx	30.8	149.3
			NOx (startup/shutdown)	301.5	
			CO	21.4	358.0
			CO (startup/shutdown)	1,909.5	
			SO_2	33.5	12.6
			VOC	12.3	39.0
			VOC (startup/shutdown)	349.5	
			$PM/PM_{10}/PM_{2.5}$	22.9	57.7
			H_2SO_4	5.2	2.0
			NH_3	22.8	85.0
			NH_3 (startup/shutdown)	34.0	
			HCOH	0.6	2.0
VIC10-LOV	VIC10-LOV	Lube Oil Vent	$PM/PM_{10}/PM_{2.5}$	0.003	0.01
COOLTWR	COOLTWR	Cooling Tower	PM	3.7	8.0
			PM_{10}	1.6	5.3
			$PM_{2.5}$	0.1	0.1
VIC10-FUG-NGAS	VIC10-FUG-NGAS	Unit 10 Natural Gas Fugitive Emissions	VOC	0.3	1.3
VIC10-FUG-SCR	VIC10-FUG-SCR	Unit 10 SCR Piping Fugitive Emissions	NH_3	0.1	0.1

EPN = Emission Point Number
FIN = Facility Identification Number

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date:	**February 2013**	**Permit No.:**	**TBD**	**Regulated Entity No.:**	**RN100214980**
Area Name:	**Victoria Power Station**			**Customer Reference No.:**	**CN602656548**

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA			EMISSION POINT DISCHARGE PARAMETERS										
1. Emission Point			4. UTM Coordinates of Emission Point			Source							
						5. Building Height (Ft.)	6. Height Above Ground (Ft.)	7. Stack Exit Data			8. Fugitives		
EPN (A)	FIN (B)	Name (C)	Zone	East (Meters)	North (Meters)			Diameter (Ft.) (A)	Velocity (FPS) (B)	Temperature (°F) (C)	Length (Ft.) (A)	Width (Ft.) (B)	Axis Degrees (C)
VIC10	VIC10	Unit 10 Combined Cycle (GE 7FA)	14	694186	3186234		150.0	18.0	52.8	250			
VIC10-LOV	VIC10-LOV	Lube Oil Vent	14	694186	3186234		6.8	0.5	12.7	amb.			
COOLTWR	COOLTWR	Cooling Tower	14	694322	3186144		55.0	28.0	20.0	amb. + 10			
VIC10-FUG-NGAS	VIC10-FUG-NGAS	Unit 10 Natural Gas Fugitive Emissions	14				10.0	0.003	0.003	amb.			
VIC10-FUG-SCR	VIC10-FUG-SCR	Unit 10 SCR Piping Fugitive Emissions	14				10.0	0.003	0.003	amb.			

EPN = Emission Point Number
FIN = Facility Identification Number