BIOLOGICAL ASSESSMENT
ETC TEXAS PIPELINE, LTD
JACKSON COUNTY GAS PLANT PROJECT
JACKSON COUNTY, TEXAS

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EXECUTIVE SUMMARY

ETC Texas Pipeline, LTD (ETC) has applied to the Environmental Protection Agency (EPA) and to the Texas Commission on Environmental Quality (TCEQ) for authorization to construct a natural gas processing facility (the Project) on 141 acres of private property located approximately 4.7 miles north of Ganado, in Jackson County, Texas (the Site). This facility will process rich natural gas to separate hydrocarbon liquids, water, and carbon dioxide (CO2) from the natural gas. As a result of the anticipated emissions the Project activates Prevention of Significant Deterioration (PSD) review.

Pursuant to the Endangered Species Act (ESA), EPA will review the Project's potential to affect federal listed Threatened and Endangered Species as part of its PSD permitting process. During a federal agency coordination meeting with Project representatives, EPA, the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service, the Project's construction disturbance, operational noise, and air emissions modeling results were reviewed and the agencies agreed that a 3-kilometer radius of analysis around the Project Site would be the appropriate Action Area for purposes of this Biological Assessment (BA).

Gremminger and Associates, Inc., as ETC's biological contractor, performed a review of existing species occurrence records, and published literature to determine the state and federal listed threatened and endangered, or sensitive species for Jackson County, Texas. GAI then reviewed multiple national and international libraries of biological literature to locate any published studies of the effects of air pollutants on the species in the Action Area. In addition to a review of the relevant literature, GAI performed a field assessment of the Project Site and nearby lands to determine the absence or presence of listed species at the Project Site, and assess the potential for species to occur at or within the Action Area.

GAI's review of published data and literature revealed no known occurrences of state or federal listed threatened or endangered species with the Action Area. Construction of the facility will have no effect on federal listed species. Analysis of noise generated by operations indicates minimal noise levels above ambient conditions will occur outside the property boundary. The bald eagle (*Haliaeetus leucocephalus*), a sensitive species, was documented as likely occupying the Action Area. GAI was unable to locate any published scientific literature suggesting that emissions of the air pollutants that will be emitted from the Project will have any direct or indirect effect on any of the state or federal listed or sensitive species or their habitat.

GAI did identify the potential for an incidental interaction between the Project's planned vertical structures and several of the listed avian species that have the potential to occur within the Action Area, including

the whooping crane, a federally-listed endangered species. The BA therefore recommends that the Project implement the USFWS's published mitigation measures for vertical structures to minimize the Project's potential interaction with the whooping crane and other avian species that could potentially traverse the Site. In light of GAI's field work and literature review, GAI has recommended a conclusion that the proposed Project will not have a direct, indirect, or cumulative effect on federal listed species as a result of construction or operations of the proposed facility; however, due to the potential incidental interaction between the vertical structures of the proposed facility and avian species that migrate through, or occupy and forage within the Action Area, GAI recommends a conclusion of "*may affect, but is not likely to adversely affect*" for the federal listed whooping crane, however unlikely a potential incidental interaction may be.

1.0 PROJECT DESCRIPTION

ETC Texas Pipeline, Ltd. (ETC) has applied to the Environmental Protection Agency (EPA) and to the Texas Commission on Environmental Quality (TCEQ) for authorization to construct four (4) natural gas processing plants and associated compression equipment (the Project), at the Jackson County Gas Plant (Site) on 141 acres of private property located approximately 4.7 miles north of Ganado, in Jackson County, Texas as shown on Figures 1 and 2 in the Illustrations. This facility will process rich natural gas to separate hydrocarbon liquids, water, and carbon dioxide (CO_2) from the natural gas. After processing, the hydrocarbon liquids and dry natural gas will be transported to market connections via existing pipelines.

Each of the four plants will be comprised of the following emission sources:

- Two dual-drive inlet gas compressor engines;
- An amine unit, controlled by thermal oxidizer;
- A cryogenic unit;
- A molecular sieve dehydration unit;
- Three electric-driven refrigeration compressors;
- A triethylene glycol (TEG) dehydration unit, controlled by thermal oxidizer;
- Three natural gas-fired residue gas compressor engines;
- Three natural gas-fired heaters;
- Storage tanks;
- Fugitives from associated piping/equipment leaks; and
- Engine blow-down and starter vents, which are controlled by a flare.

The Project will result in increases of greenhouse gases (GHG), carbon monoxide (CO), hydrogen sulfide (H_2S), oxides of nitrogen (NOX), particulate matter (PM, PM_{10}, and $PM_{2.5}$), sulfur dioxide (SO_2), Hazardous Air Pollutants (HAP), and volatile organic compounds (VOC). The GHG are calculated as carbon dioxide equivalents (CO_2e). As discussed in more detail in Section 1.2, ETC is requesting both EPA's and TCEQ's authorization for the construction of the Project because Texas is now under dual permitting authority.

Under EPA's authority pursuant to the Clean Air Act (CAA), the Project will constitute a new major source of GHGs since the Project-related GHG emissions will be greater than the major source thresholds of 100,000 tons per year (T/yr) CO_2e and 250 T/yr GHG mass. As a result of these anticipated emissions, the Project triggers Prevention of Significant Deterioration (PSD) review for GHGs. Authorization for other air emissions associated with the Project is being sought from TCEQ as the permitting authority in Texas for non-GHG emissions.

2.0 SCOPING OF BIOLOGICAL ASSESSMENT AND ACTION AREA

2.1 Purpose of the Biological Assessment (BA)

Pursuant to Section 7 of the Endangered Species Act (ESA), 16 U.S.C. § 1536, the EPA will review the Project's potential effect to federal listed Threatened and Endangered Species as part of its PSD permitting process for the Project. Section 7 of the ESA requires that, through consultation with the U.S. Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS), federal agencies determine if their proposed actions are not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of designated critical habitat.

This BA reviews the potential direct and indirect effects of the Project's construction, operations, and air emissions from the Project's operation, on federally-listed species and designated critical habitat within an agency-coordinated "Action Area" covering habitats within 3 kilometers of the proposed Project Site for the Jackson County Gas Plant.

Section 9 of the ESA, 16 U.S.C. § 1538, prohibits any person from "taking" a listed species. "Take" is defined to mean "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or to attempt to engage in any such conduct." 16 U.S.C. § 1532. "Harm" is further defined by regulation to mean actually killing or injuring wildlife, but that includes such harm resulting from significant habitat modification where the modification results in death or injury to a member of a listed species, including by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering. 50 C.F.R. § 17.3. This BA evaluates whether any direct or indirect effect of the Project is likely to take or harm any listed species.

2.2 Discussion on Scope of Biological Assessment

On September 15, 2011, the EPA issued a formal "non-federal representative" designation to Project representatives including ETC, Gremminger and Associates, Inc, Bracewell & Giuliani, LLP, and TITAN Engineering, Inc. for the purpose of undertaking informal consultation with the USFWS and NMFS, and after conferring with the agencies, preparing a BA for consideration and use by EPA.

An initial discussion was initiated with the USFWS - Ecological Services Field Office in Corpus Christi, Texas and the Endangered Species Section of the NMFS in St. Petersburg, Florida, resulting in a September 28, 2011 meeting attended by the combined federal agency staff and project representatives

(the Initial Discussion). The participants in the Initial Discussion attending either in person or by telephone included the following individuals:

- USEPA Region 6, Office of Regional Counsel, Tina Arnold;
- NMFS Endangered Species Branch; Chief, Robert Hoffman;
- NMFS Biological Staff; Adam Brame;
- USFWS Corpus Christi Ecological Services Staff, Dawn Whitehead, Clare Lee, and Mary Orms;
- ETC Texas Pipeline; Environmental Manager, Jeff Weiler;
- Bracewell & Giuliani; Counsel, Timothy Wilkins;
- Gremminger and Associates, Inc.; Certified Wildlife Biologist, Larry Gremminger; and
- TITAN Engineering; Engineer, Kathryn Donnell and David Grossman.

The purpose of the Initial Discussion was to introduce and describe the Project for the federal agencies; to discuss the scope of the analysis in accordance with current federal regulations; to reach agreement on how to define a geographic Action Area based on the Project's modeled emissions; to reach agreement on what pollutants to consider for purposes of direct or indirect effects of emissions on listed species or their habitat; and to review the federally-listed species to be considered within the Action Area and related species-specific issues for purposes of scoping and preparing this BA.

Developments like the Project have the potential to directly affect listed species through alteration of existing habitat during construction of the facilities and by disturbing listed species occupying the project site or immediately adjacent lands during the construction processes. Developments like the Project could also have direct or indirect potential to affect listed species through acute or chronic effects resulting from exposure to operational noise and air emissions. This type of gas processing facility will not have a process discharge of waste water. Stormwater events will not typically result in rainfall interaction with open sources of hydrocarbon materials. On site holding tanks will be within retention structures so that any hydrocarbon tainting of received rainfall can be confined and disposed of in accordance with standard industry practices and regulatory requirements.

After discussing the Project's location, the nature of the construction activities and the types and size of planned facilities, the results of the modeled air emissions, and the possible listed species in Jackson County, the meeting's attendees agreed that the geographic scope of the Biological Assessment for the Project would be significantly influenced by the radial distances predicted by the air dispersion modeling. Concentrations of criteria pollutants are predicted by dispersion modeling of the Project emissions. These concentrations are compared to their respective EPA-designated Significant Impact Levels (SILs) of the secondary National Ambient Air Quality Standards (NAAQS). For all of the relevant emissions, pollutant concentrations fall below their respective SILs at less than a kilometer from the Project's property boundary. As a conservative measure, ETC is utilizing a larger radius of three (3) kilometers from the property boundaries to establish the Action Area for this BA.

EPA has established secondary NAAQS to provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. EPA defines the SIL as a *de minimis* concentration emitted from an individual facility applying for a permit to emit a regulated pollutant (*e.g.*, criteria air pollutants) in an area that is in attainment (*i.e.*, meets the NAAQS for that pollutant). As part of the Prevention of Significant Deterioration (PSD) review process, the state environmental regulatory agency and/or EPA evaluate whether the emissions from a proposed facility will cause air quality to deteriorate significantly. Air permitting authorities use SILs as evaluation criteria for determining whether a proposed facility has any potential to cause or contribute to an exceedence of the NAAQS and/or a PSD increment. If the modeled emissions for a specific pollutant do not exceed the SIL for a pollutant at any modeled location, the air permitting authorities conclude that no further analysis is necessary for that pollutant.

2.3 Project Air Emissions Analysis and Results

In order to predict the maximum SIL radial distances and footprints for application to the Project BA, ETC's environmental consultants utilized the AMS/EPA Regulatory Model (AERMOD), applying proposed Project emission rates and stack parameters to predict the maximum Project impacts for the following criteria air pollutants and associated averaging periods, for which the EPA has promulgated secondary NAAQS and SILs:

- Nitrogen dioxide **(**NO_2**):** annual;
- Particulate matter (PM) having an aerodynamic diameter of 10 microns or less **(**PM_{10}**):** 24-hour;
- PM having an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$): 24-hour and annual; and
- SO_2**:** 3-hour.

The emissions modeling analyses were conducted using the historical long-term meteorological data set that the Texas Commission on Environmental Quality (TCEQ) prepared from hourly surface observations and twice-daily mixing heights from the National Weather Service (NWS) station in Victoria, Texas. The Victoria NWS station is an appropriate data source as it is located approximately 50 kilometers (30 miles) to the west-southwest of the Project site, making the Victoria meteorological data closely representative of the meteorological conditions and regimes at the Project site. Moreover, the TCEQ recommends that the Victoria meteorological data set be used for PSD dispersion modeling analyses conducted for locations in Jackson County, Texas.

Based upon the results from the AERMOD modeling of the Project's emissions and rate of dispersion from the Project's property boundary, the Plant's design impacts will be:

- Below the secondary NAAQS for all pollutants and averaging periods;
- Below the SIL for 24-hr PM_{10} and 3-hr SO_2;

- Above the SIL, with a 1-kilometer or less radius of impact, for annual NO_2, 24-hr $PM_{2.5}$;
- Annual $PM_{2.5}$;
- Emissions of 259.75 tons per year of Hazardous Air Pollutants (HAPs); and
- Emissions of 599,412 tons per year of Greenhouse Gases expressed as CO_2e.

A copy of the Prevention of Significant Deterioration Air Quality Analysis Report and summary tables for emissions is provided in Appendix A of this BE.

2.4 Operations Noise Analysis and Results

There are no applicable county, state, or federal regulations or ordinances concerning noise generation that directly apply to the proposed facility.

Noise from operations of the Project could directly or indirectly affect federal listed species by causing dispersion or relocation of individuals or populations of species utilizing the tract of development or adjacent lands within a radius of noise effect emanating from noise sources with the facility.

Potential noise affects from operations is analyzed by using standardized methodologies developed by federal agencies for assessing potential affects from noise sources to Noise Sensitive Areas (NSA) such as residential homesites to provide a comparison analysis. The threshold noise level for conclusions of no effect to human NSAs is 55 decibels leveled day-night (Ldn dBA).

A noise analysis of the compressor engines and engine coolers and discussion of the results is provided in Appendix B of this BE.

In general, though noise from operations will be perceptible to humans and wildlife to some extent immediately adjacent to the north, east, and south property lines, little to no effect to endemic wildlife is expected since the noise sources are constant and limited, rather that abrupt and excessive. The 52.7 dBA level from the 3616 engine coolers at the east property line is less than measured noise from passing vehicles at near distances, and less than many types of noise that are casually disregarded by humans and wildlife.

The USEPA study “Effects of Noise on Wildlife and Other Animals” published in 1971, and referenced basis document on this subject, reported no discernible effects to any types of wildlife or animal species from noise sources less than 70 Leq dBA.

GAI concludes that noise from operations of the proposed Project will have no direct, indirect, or cumulative effect to noise sensitive receptors outside the property limits.

2.5 Determination of Action Area for Biological Assessment

For direct and indirect effects, the Action Area could include not only the limits of physical disturbance for construction of the Project but also nearby lands disturbed by noise from construction or generated by operations, as well as air emissions from operation of the Project. After consideration and discussion of the potential scope and extent of the direct and indirect effects, the results of the AERMOD modeling of the emissions from the Project, and review of recent BAs prepared for other air permits processed by the EPA, the federal agency representatives at the Initial Discussion agreed that a three (3) kilometer (1.86 mile) radius from the Site's property line was the appropriate Action Area for purposes of this BA.

The Project location is seventy-five (75) kilometers inland from the Gulf of Mexico water line. As such, the Project and Action Area do not extend to areas that have species or habitat under the jurisdiction of the NMFS. Accordingly, during the Initial Discussion, the NMFS decided that participation by their agency was no longer necessary.

2.6 Description of the Physical and Biological Attributes of the Action Area

The Project property is located within the Gulf Coast Prairies Major Land Resource Area of the Atlantic and Gulf Coast Lowland Forest and Crop Land Resource Region (NRCS) and simultaneously within Ecoregion 34; Floodplain and Low Terraces of the Western Gulf Coastal Plain. As previously mentioned, the property consists of a 141 acre tract of land, 110 acres (77%) of which is predominantly Dacosta sandy clay loam and currently managed for rice production. The remaining 31 acres (23%) is predominantly Edna fine sandy loam and supports a live oak (*Quercus virginiana*) dominated mixed woods habitat with inclusions of water oak (*Quercus nigra*), cedar elm (*Ulmus crassifolia*), and sugarberry (*Celtis occidentalis*). The understory is characterized by yaupon holly (*Ilex vomitoria*), American beautyberry (*Callicarpa americana*), McCartney rose (*Rosa bracteata*), southern dewberry (*Rubus trivialis*), green briers (*Smilax* spp.), and little bluestem (*Schizachyrium scoparium*). The property is bounded by man-made irrigation ditches on the northeast, east, and south sides of the property. Vegetation within the irrigation canals consists primarily of flat sedges (*Cyperus* spp.) and smartweed (*Polygonum hydropiperoides*).

The proposed plan of development for the Project would result in the conversion of all this property to industrial use. Although not all the property would be covered by buildings or roads, the associated facility components, internal piping, incoming and outgoing service pipelines and interconnects to the Project will utilize the remainder of the property. Outside of building, roads, and facility containment areas, the majority of the property will be covered with gravel or sod.

Within the Action Area, approximately 80% of the adjacent lands are either actively farmed, have been allowed to go fallow, or have rural residences, roadways, or utility easements. The lands in active agricultural use have been laser-leveled, are leveed and terraced, and are irrigated by a series of man-made irrigation ditches for the production of rice. The fallow agricultural lands exhibit evidence of past use for rice production with terraces and levees still in place. The remaining 20% of the adjacent land is comprised of a mature mixed hardwood forest dominated by oaks (*Quercus sp*.) that occur within the riparian corridor adjacent to Sandy Creek.

3.0 LISTED THREATENED, ENDANGERED, OR SENSITIVE SPECIES

This section of the BA presents and discusses the USFWS designated federal listed threatened and endangered species and designated critical habitat; non-designated federal listed threatened and endangered species of historic or limited potential occurrence, and other sensitive species protected by existing federal regulation for Jackson County, Texas, including a discussion of whether they may be present in the Action Area. Notably, the Action Area in its entirety is contained within Jackson County.

3.1 Federal Listed Species

The U.S. Fish and Wildlife Service's internet database lists the West Indian manatee (*Trichechus manatus*) and whooping crane (*Grus americana*) as the only designated threatened and endangered species for Jackson County, Texas. There is no designated critical habitat for federal listed species in Jackson County.

3.1.1 West Indian Manatee

The West Indian manatee is a large, long-lived herbivorous marine mammal lacking hind limbs sometimes called a sea cow. The manatee's diet consists solely of aquatic submerged, floating, and some emergent vegetation found at one to two meters in depth of warm fresh, estuarine, and/or marine waters.

There is no designated critical habitat for the West Indian manatee along the Texas Gulf coast, its estuaries, or rivers. Rare isolated occurrences of individuals of this species have been documented in the coastal waters of Texas in the last decade; however, genetic analysis of cell samples obtained from these individuals indicates their origin from either the Florida or Caribbean population of manatees. There are no known established populations of this species in Texas.

3.1.2 Whooping Crane

The whooping crane is a large, predominantly white bird that stands approximately five feet tall and has a wing span of approximately seven feet. Their diet consists of large insects, crustaceans, mollusks, frogs, fish, small mammals and birds, berries and, during fall migrations, agricultural grains. Typically, whooping cranes prefer isolated areas away from human activities. The whooping crane migrates between their summer breeding grounds of extensive wetland-pothole complexes within Wood Buffalo National Park in northern Canada to their wintering grounds in the coastal marshes within and around Aransas National

Wildlife Refuge and Matagorda and St. Joseph's Islands in Aransas, Calhoun, and Matagorda counties, Texas.

Critical habitat has been designated at five sites in four U.S. states, and is proposed in Canada. These include the wintering grounds at and adjacent to the Aransas National Wildlife Refuge (NWR) in Texas, and four stopover aquatic habitats on public lands in Kansas, Nebraska, and Oklahoma (USFWS 2007b). The cranes typically migrate through the Great Plains U.S. states of Texas, Oklahoma, Kansas, Nebraska, South Dakota, and North Dakota, as well as the Canadian Provinces of Saskatchewan, Alberta and eastern Manitoba. Within Texas, their normal migration corridor stretches from the panhandle eastward to the east-central portion of the state. During their 2,500-mile migration, the whooping cranes can make 12 to 15 stops, during which they use a variety of habitats that are generally isolated from human activity (USFWS 2007b, USFWS and Wind Energy Industry 2008). These stopover areas include croplands, grasslands, and wetlands for feeding sites and wetlands and other aquatic features for roosting sites.

3.2 Non-Designated Federal Listed Species

As listed by the State of Texas Natural Heritage Database, there are eight (8) non-designated federal listed species that historically occurred, or have limited potential to occur in Jackson County, Texas.

3.2.1 Smalltooth Sawfish

The smalltooth sawfish is an occupant of the coastal waters of the Gulf of Mexico. Historically this species ranged from the Texas Gulf Coast east to Florida and north along the Atlantic Coast to Cape Hatteras, North Carolina, but currently occur only along the southern tip of Florida. The species may grow up to 25 feet long and live 25-30 years. Designated critical habitat for the smalltooth sawfish includes the southern and southwestern coast of Florida. There are no known populations of smalltooth sawfish along the Texas coast. Smalltooth sawfish have marine and estuarine habitat requirements which do not occur within the Action Area, and no further analysis for this species is provided in this BA.

3.2.2 Red Wolf

The red wolf is currently extinct in Texas. Its historic range included the eastern half of Texas east to the Atlantic coast and north to at least central Pennsylvania and perhaps into Canada. No critical habitat has been designated for this species, and no further analysis for this species is provided in this BA.

3.2.3 Louisiana Black Bear

The Louisiana black bear is a sub-species of the American black bear with a longer skull that is more narrow and flat than the parent species. Preferred habitat includes mixed bottomland hardwood forest with diverse resources. Hard mast producing species are necessary as are remote areas with little human activity or disturbance. Females prefer winter den sites in hollow trees, especially cypress or tupelo, or brush piles to bare their young; usually a litter of one to three pups. Designated critical habitat is located within three river basins in the eastern one-third of Louisiana. The Louisiana black bear is a historical recording for Jackson County, and all recent verified occurrences are limited to far northeast Texas. This species does not occur within the Action Area, and no further analysis for this species is provided in this BA.

3.2.4 Interior Least Tern

Adult interior least terns average eight to ten inches in length making them the smallest tern in North America. Adult plumage is gray above and white below with black marking on the head. In Texas, the species may utilize shallow water habitats along the Gulf Coast region during the winter season. During the breeding season the interior least tern utilizes several reservoirs in southern Texas and portions of the Canadian and Red Rivers in northern Texas. No critical habitat has been designated. The interior least tern is a user of larger riverine and open waters in Texas; none of these habitats occur within the Action Area, and no further analysis for this species is provided in this BA.

3.2.5 Kemp's Ridley Sea Turtle

Adult Kemp Ridley sea turtles are carnivorous marine reptiles averaging about 100 pounds with a carapace of approximately 26 inches. The majority of the diet consists of crabs with some crustaceans and mollusks. No critical habitat has been designated. Kemp Ridley sea turtles have marine and estuarine habitat requirements which do not occur within the Action Area, and no further analysis for this species is provided in this BA.

3.2.6 Loggerhead Sea Turtle

Adult loggerhead sea turtles are carnivorous marine reptiles ranging from 170 to over 500 pounds with a carapace up to 45 inches long. Individuals can be found within brackish coastal lagoons, bays, and estuaries and in tropical or temperate waters above 50 degrees Fahrenheit. They feed on a variety of marine animals including crustaceans, mollusks, sponges, fish, jelly fish and sea urchins. Loggerhead females do not use the Gulf of Mexico as a primary nesting area. The species is therefore only an

occasional visitor to the Texas coast. No critical habitat has been designated. Loggerhead sea turtles have marine and estuarine habitat requirements which do not occur within the Action Area, and no further analysis for this species is provided in this BA.

3.2.7 Green Sea Turtle

Adult green sea turtles are herbivorous marine reptiles ranging from 300 to 350 pounds with a carapace up to three feet long. Individuals can be found in near shore marine areas feeding on seagrasses and algae. Green sea turtle females do not use the Gulf of Mexico as a primary nesting area. The species is therefore only an occasional visitor to the Texas coast. Critical habitat has been designated in coastal waters around Culebra Island, Puerto Rico. Green sea turtles have marine and estuarine habitat requirements which do not occur within the Action Area, and no further analysis for this species is provided in this BA.

3.2.8 Texas Fatmucket

The Texas fatmucket is a freshwater mussel that historically inhabited the low-bank sides of moderate-sized, relatively shallow, perennial flowing rivers. This species is known to occur in the project's watershed in the Lavaca and Navidad rivers; however, the only water with the Action Area is Sandy Creek, which is not a perennial flowing water and, as such, cannot provide habitat for this species. The Project will not affect this species, and no further analysis for this species is provided in this BA.

3.3 Bald and Golden Eagle Protection Act (BGEPA)

3.3.1 Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) is afforded federal protection under the BGEPA and is being monitored by the USFWS since it was officially delisted in August 2007. Since it was federal listed as endangered in 1978, the bald eagle population has steadily increased throughout the lower 48 states.

There are records from 2005 of bald eagle nests located one (1) mile to the north and ten (10) miles to the south of the Project Site along Sandy Creek (Brent Ortego; TPWD, 2011). The current status of these two nests is not known. No nests were observed within or adjacent to the Project Site on July 20, 2011 during a pedestrian assessment by GAI biologists. The probability that a bald eagle would nest on or immediately adjacent to the Project property is very low due to the general lack of large trees preferred for nest development, but it would be expected to occur within the Action Area while foraging due to known

nest records in the vicinity of the Project Site. A discussion of the bald eagle will be included in the results and conclusion of this BA.

4.0 BIOLOGICAL ASSESSMENT METHODOLOGY

Potential effects of the proposed Project were reviewed through a species occurrence database search, detailed literature search, and ground-based analysis to evaluate the potential direct and indirect effects of both construction activities and air emissions from Project operation. This included a thorough background review of existing data providing information on ecology prior to performing a pedestrian assessment of the proposed Project Site to identify those habitats that would be directly affected by the construction of the project, and those occurring within the Action Area surrounding the Project Site. Additionally, air emission modeling and chemical compound characteristics data was compiled and analyzed in Section 2.3 and Appendix A of this BA.

4.1 Species Occurrence Records Database

A database search of the Natural Heritage Database maintained by the TPWD was requested to obtain the location record for any known occurrence of state- or federal-listed species on or adjacent to the Project location or within the larger Action Area.

4.2 Literature Reviewed

The source review of public databases for published literature regarding the supporting requirements of federal listed species and scientific literature for published studies of emissions effects on West Indian manatee and whooping crane included:

- FWS Critical Habitat for Threatened & Endangered Species http://criticalhabitat.fws.gov/crithab/
- TPWD species/critical habitat descriptions http://www.tpwd.state.tx.us/landwater/land/habitats/cross_timbers/habitat_management/
- Mammals of Texas species/critical habitat descriptions http://www.tpwd.state.tx.us/huntwild/wild/species/endang/animals/mammals/
- Endanger and threatened Animals of Texas http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_bk_w7000_0013.pdf
- Cornell University Library http://www.library.cornell.edu/resrch/intro
- Texas A&M Cesar Kleberg Research Institute, electronic library http://cushing.library.tamu.edu/
- The Wildlife Society, Wiley On-Line Library http://onlinelibrary.wiley.com/
- Current literature, where available, regarding potential impacts of air emissions on wildlife and the associated habitats of the Radius of Analysis area.

The source review of published literature on the supporting requirements of the state-listed species for Jackson County, Texas included:

- TPWD species/critical habitat descriptions
  http://www.tpwd.state.tx.us/landwater/land/habitats/cross_timbers/habitat_management/
- Endangered and Threatened Animals of Texas
  http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_bk_w7000_0013.pdf

4.3 Habitat Assessment Methods

4.3.1 Review of Existing Published Data

An analysis was conducted based on a review of published data, listed below, from state and federal agencies. This assessment included identifying vegetation strata and communities that would possibly be considered suitable habitat for state and federal listed species. It included identifying agricultural croplands, potential wetlands and open water, various vegetation types, and rural residential developments. The data base sets include:

- U.S. Department of the Interior; National Wetland Inventory Maps (NWI);
- U.S. Department of Agriculture: Natural Resource Conservation Service; Web Soil Survey;
- Historic Black and White Aerial Photography, dated 1995, 2005, and 2009;
- Recent Color Aerial Photography dated 2010;
- Color Infra-red Aerial Photography dated 2009, and
- U.S. Geologic Survey Topographic Quadrangle Maps.

4.3.2 Field Assessment Method

A pedestrian survey and assessment of the proposed project site and lands within the Action Area was conducted on July 20, 2011 by James Pittman, Environmental Scientist from Gremminger and Associates, Inc., to verify identified habitat types, quality and acreages originally calculated from aerial imagery. Habitat types were delineated and vegetation species, densities, and strata recorded using random points with 10 to 30 meter radii on transects where appropriate during the review of the entire tract.

The habitat types or land uses outside the development tract but within the Action Area were documented by accessing the adjacent areas using public roadways while making observations of any transition in habitat types, species composition, or land use.

Additionally, GAI biologists Larry Gremminger, CWB, and Elton Muzny are long term residents of the Project area with nine years, and thirty-two years respectively of permanent occupation in the vicinity of the proposed Project. Their species occurrence observations from field time over years, and ground-based knowledge of habitat conditions enhances the field assessment results and supplements the published data base information for habitat conditions adjacent to the Project and within the Action Area.

5.0 ENVIRONMENTAL BASELINE AND EFFECTS ANALYSIS

This section provides the results of the investigations performed in order to evaluate the potential for the proposed project to affect federal threatened, endangered, or sensitive species.

Of all the criteria air pollutants and modeled emissions presented and discussed in Section 2.0, the NO_2 and SO_2 behavior and concentrations are of concern to biologists since these emission compounds have been documented under specific climatic conditions to combine with oxygen and water to create nitric acid or sulphuric acid and precipitate from the atmosphere as "acid rain." Acidification of the natural environment has been documented to result in detrimental effects to plants and animals in the area of event occurrence. The specific circumstances that can result in acid rain are better explained in an article by the EPA on their website "An inversion can prevent the rise and dispersal of pollutants from the lower layers of the atmosphere." (http://www.epa.gov/eogapti1/course422/ce1.html). As discussed in this presentation and analysis by the EPA, due to the short stack height of the Project emission points (<75 foot of height) and the downdraft caused by the facility's tower and compressor buildings, the emission plume's ability to travel into the upper atmosphere and contribute to the formation of acid rain is limited by settling and disrupted air flows occurring at the ground level. The ground level concentration was also measured and modeled to show the compositions and levels in relation to SIL. In summary, these emissions will disperse before they could reach the upper atmosphere and react in a manner that could cause or contribute to acid deposition and, accordingly, the potential for any negative biological effects from acid deposition is correspondingly minimal.

No other concerns related to the emissions of the other criteria air pollutants, HAPS, or GHGs have been documented to be of direct concern by field biologists and ecologists.

5.1 Results of the Species Occurrence Records Database Review

A Natural Heritage Database review of the occurrence records of the Texas Parks and Wildlife Department did not indicate any known occurrence of state or federal listed species on the Project location or within the Action Area.

5.2 Results of Literature Review

The lists and discussions of listed federal threatened, endangered, and sensitive species are presented in Sections 2.0 of this BA. Based on current published data and habitat descriptions, there are no known occurrences of federal listed species occupying the Project location or within the Action Area.

The results of the literature review performed at all the reference libraries listed in Section 3.1 resulted in identifying no published scientific studies on or related to the effects of air emissions on West Indian manatee, whooping cranes, or related species in the Family *Gruidae*.

Database sites like the Wildlife Societies Wiley Library were reviewed for published studies of the potential effects of air emissions on wildlife using, migrating, or foraging through emissions-affected or polluted air environments. After a thorough review of the resources cited above, GAI has found no documented scientific evidence of any effect of air emissions like those associated with the Project on wildlife or natural habitats at or above SIL levels as discussed in Section 2.4.

5.3 Results of the Noise Analysis

As discussed in Section 2.4, and based on the analysis provided in Appendix B, and federal reference document, GAI concludes that noise from operations of the proposed Project will have no direct, indirect, or cumulative effect to noise sensitive receptors outside the property limits.

5.4 Species Analysis

5.4.1 West Indian Manatee

The West Indian manatee has no known populations within the Texas coastal waters and it is physically impossible for an individual of this species to occur within the Action Area due to the Lake Texana dam and the resulting inability for any aquatic bound species to bypass this structure. The Project site is 24 kilometers (15 miles) north-northeast of the nearest possible access via marine and estuarine waterways. Agricultural fields and mesic coastal woodlands are not supporting habitat for this species. Therefore there is no possible means for the construction or operations of the Project to directly affect an individual of this species.

Additionally, there are no published studies or other information GAI has been able to locate after thorough research suggesting any direct or indirect effect of air emissions on the West Indian manatee. There is no evidence that emissions from the Project's operations would have any direct or indirect effects on this species. Since no physical presence of this species is possible within the Action Area, noise from operations will have no effect to the species.

Accordingly, GAI concludes that the Project will not have any direct, indirect, or cumulative effect on the West Indian manatee since the species does not and will not occur within the Action Area.

5.4.2 Whooping Crane

Although GAI is aware and have directly observed family groups and isolated individuals of whooping cranes utilizing the estuarine and adjacent upland coastal prairie habitats of upper Matagorda Bay, GAI staff has never observed or been informed of observations of this species in the immediate vicinity of the Project location. The nearest observed occurrence of the species by GAI biologists is 57 kilometers (35 miles) south in the coastal marshlands of north Matagorda Bay where the habitats preferred by this species do occur. The mesic wooded environment in the western portion of the tract and active rice fields in the eastern portion of the tract are not preferred habitats for this species. The pasture land, mesic woodlands, and active and fallow agricultural land within the Action Area are not preferred foraging or loafing habitats for this species.

There are no published scientific studies or other sources of reliable information GAI has been able to locate after thorough research suggesting there is any direct or indirect effect of air emissions on whooping cranes. Given that there is no information or studies suggesting an impact, and given the absence of detected impacts to whooping cranes by air emissions despite their greater residence time in near vicinity to other sources of comparable air emissions in proximity to occupied wintering habitat, GAI believes that the possibility of actual adverse effects from air emissions are undetectable or non-existent and should be deemed discountable since available evidence indicates such effects are highly unlikely to occur.

While it is possible that whooping cranes could enter the Action Area on a rare and transient basis, the Action Area does not include any preferred habitat. An occurrence of a family group or individual at the Project location would be an abnormal event, even during migration to or from the traditional wintering habitat for the species. This species is known for their long migration routes in the spring and fall and it has been recorded that during the migrations whooping cranes can be blown or driven off their preferred routes. It is also known that during unseasonable conditions such as drought, whooping cranes will travel great distances in search of food. It is therefore theoretically possible that this species could on an occasional and transient basis travel through the Action Area and the Project Site. Based upon the lack of this species presence within the Action Area, noise from operations will have no indirect, direct, or cumulative effect, and could have a minimal positive effect by being a deterrent to the species if an individual or family group transits the Project area.

Whooping cranes and other birds have documented striking potential with vertical structures and overhead electrical supply wires. These strikes can result due to lack of structure visibility or adverse atmospheric conditions such as fog or severe storms. Due to the possibility, however low, of this species potential to travel through the Project Site during migration or as a result of adverse weather conditions,

and with documented strikes with introduced structures, GAI concludes that the Project has an extremely low likelihood of an incidental takes of this species. To off-set this potential the Project should implement mitigation strategies for proposed new electrical service lines and vertical structures. The USFWS offers several mitigation options for vertical structures and overhead lines to decrease the potential interaction with avifauna. These mitigations methods and references are included in Appendix 2 of this BA.

Of these, ETC will employ bird diverters on the electrical service lines to the new facility and inquire on donating some additional diverters for placement on the existing overhead electrical lines in immediate vicinity to the facility; and will down shield any continuous night lighting.

5.4.3 Bald Eagle

Brent Ortego of TPWD informed GAI of two (2) possibly active bald eagle nests last documented in 2005. One is within the northwest portion of the Action Area along Sandy Creek; the other is outside the Action Area, approximately ten (10) miles south-southwest from the Project Site, also along Sandy Creek.

There are no published studies or other information GAI has been able to locate after thorough research suggesting any direct or indirect effect of air emissions on the bald eagle. There is no evidence that emissions from the Project's operations would have any direct or indirect effects on this species.

As discussed for the whooping crane, the potential exists for an incidental species interaction with the bald eagle in relation to proposed vertical structures. The Project should implement mitigation strategies to minimize this potential and consider the USFWS mitigation options for vertical structures and overhead lines to decrease the potential interaction with this species. These mitigation methods and references are included in Appendix 2 of this BA.

6.0 EFFECTS DETERMINATION AND SUMMARY

West Indian Manatee

As presented and discussed in Section 5.0 of this BA, the potential effects from development and operations of the proposed Project were carefully reviewed and it was determined that there is no potential for direct, indirect, or cumulative affects to West Indian manatee. Therefore, GAI recommends a conclusion of "*no effect*" on the West Indian manatee.

Whooping Crane

As presented and discussed in Section 5.0 of this BA, the potential effects from development and operations of the proposed Project were carefully reviewed and it was determined that there is no potential for direct, indirect, or cumulative effects from construction or operational noise and emissions to the whooping crane.

Due to known behavioral variations, and documented vertical structure strikes by this species, GAI has identified a highly unlikely possibility for an incidental take of this species to occur, and recommends a conclusion of "*may affect, but is not likely to adversely affect*" for the whooping crane, noting the low probability of any such event.

As a conservation measure, the installation of bird diverters on new electrical lines and down-shielding of any continuous nighttime lighting will assist in decreasing any potential incidental effects of the Project to the whooping crane or other avian species that potentially occur in the Action Area, rendering any such effects even more unlikely.

Bald Eagle

As presented and discussed in Section 5.0 of this BA, the potential effects from development and operations of the proposed Project were carefully reviewed and it was determined that there is no potential for direct, indirect, or cumulative effects from construction or operational emissions to bald eagles occupying nest locations or otherwise occurring within the Action Area.

As a conservation measure, the installation of the bird diverters and shielded lighting to address the incidental potential of the whooping crane will also assist in decreasing any potential incidental effects of the Project to bald eagles in the area such that any adverse effect would be very unlikely.

7.0 REFERENCES

FWS Critical Habitat for Threatened & Endangered Species http://criticalhabitat.fws.gov/crithab/

TPWD species/critical habitat descriptions
http://www.tpwd.state.tx.us/landwater/land/habitats/cross_timbers/habitat_management/

Mammals of Texas species/critical habitat descriptions
http://www.tpwd.state.tx.us/huntwild/wild/species/endang/animals/mammals/

Endanger and threatened Animals of Texas
http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_bk_w7000_0013.pdf

Cornell University Library http://www.library.cornell.edu/resrch/intro

Texas A&M Cesar Kleberg library http://cushing.library.tamu.edu/

The Wildlife Society Wiley Library http://onlinelibrary.wiley.com/

50 C.F.R 17.3 - Title 50 Wildlife and Fisheries Chapter I--United States Fish and Wildlife Service, Department of The Interior; Part 17 Endangered and Threatened Wildlife and Plants; Subpart A Introduction and General Provisions; Sec. 17.3 Definitions;
http://nplnews.com/toolbox/esakit/50cfr402.htm#12

U. S. Fish and Wildlife Service 50 C.F.R.§ 402.12 (c) Biological assessments - (c) Request for information. The Federal agency or the designated non-Federal representative shall convey to the Director; http://nplnews.com/toolbox/esakit/50cfr402.htm#12

50 C.F.R.§ 402.12(f) Biological assessments - (f) Contents. The contents of a biological assessment are at the discretion of the Federal agency and will depend on the nature of the Federal action. The following may be considered for inclusion; http://nplnews.com/toolbox/esakit/50cfr402.htm#12

National Environmental Policy Act of 1969 (NEPA) [(42 U.S.C. 4332(2)(C)];
http://ceq.hss.doe.gov/nepa/regs/nepa/nepaeqia.htm

El-Hage, Albert et al. 1999. Evaluation *of Natural Resources in Lavaca Water Planning Area (Region P).* Resource Protection Division: Water Resource Team. Texas Parks and Wildlife Department.

USEPA: “Effects of Noise on Wildlife and Other Animals”, 1971

SIGNATURE PAGE

Prepared by:

Larry J. Gremminger, 1-06-2012

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Managing Environmental Scientist
Gremminger and Associates, Inc
226 South Live Oak Street
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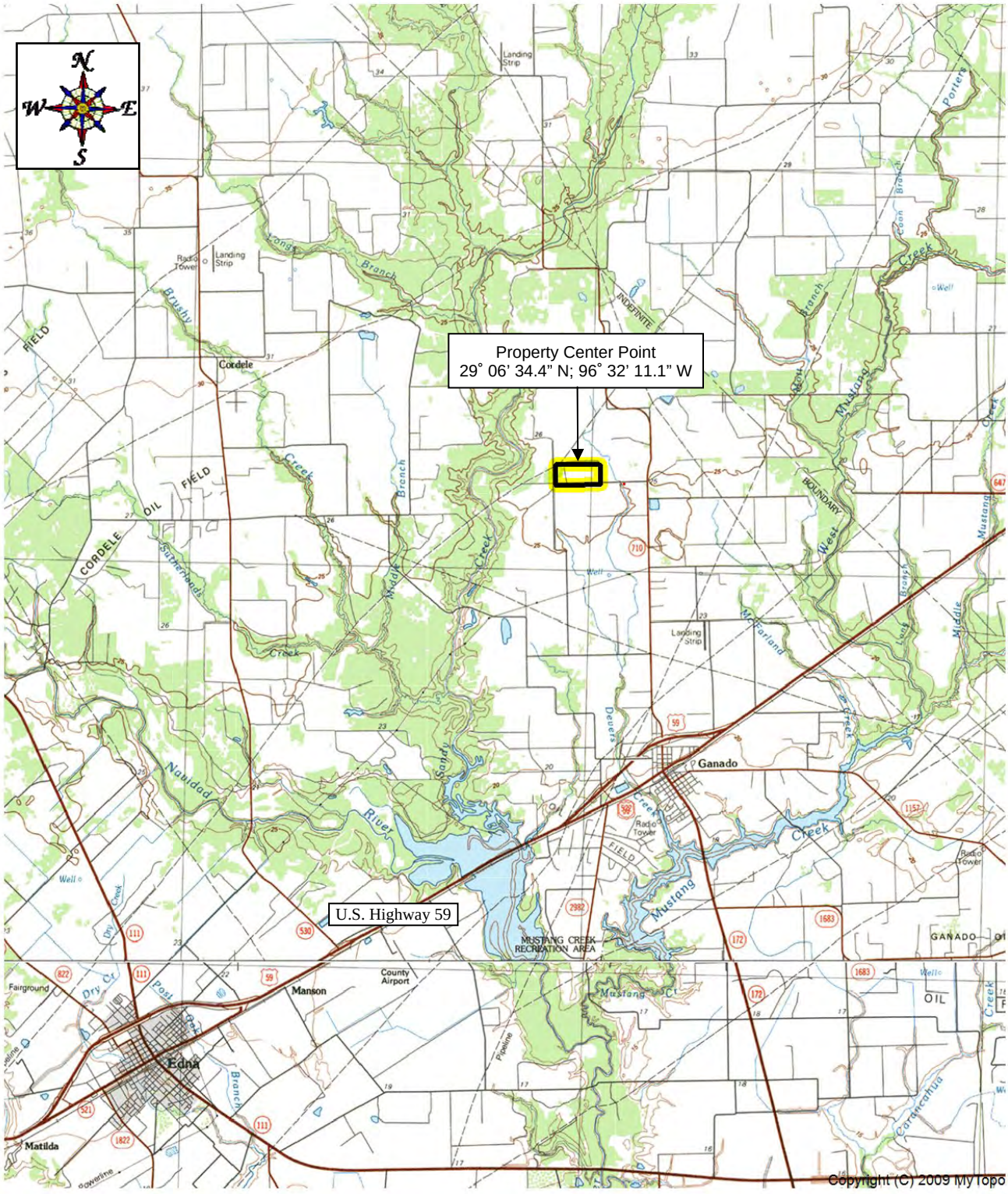
ILLUSTRATIONS



ENERGY TRANSFER

Project Location Map
ETC Texas Pipeline LTD
Jackson County Gas Plant Project
Jackson County, Texas

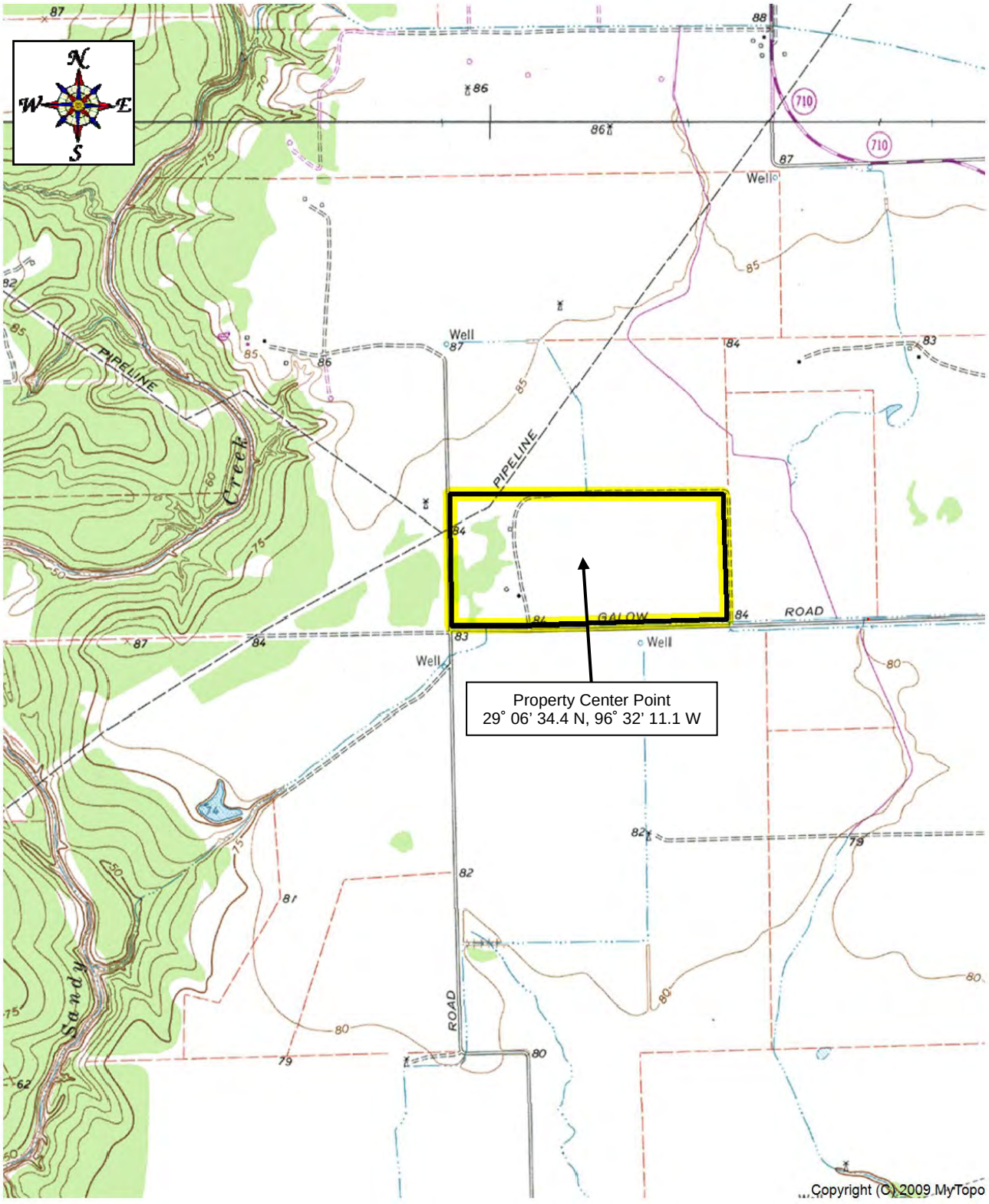
Scale: 1:150,000

Gremminger and Associates, Inc.
environmental planning and permitting consultants

FIGURE: 1

DATE: 11/16/2011

GAI Project Number: 211155



ENERGY TRANSFER

Project Location Map
ETC Texas Pipeline LTD
Jackson County Gas Plant Project
Jackson County, Texas

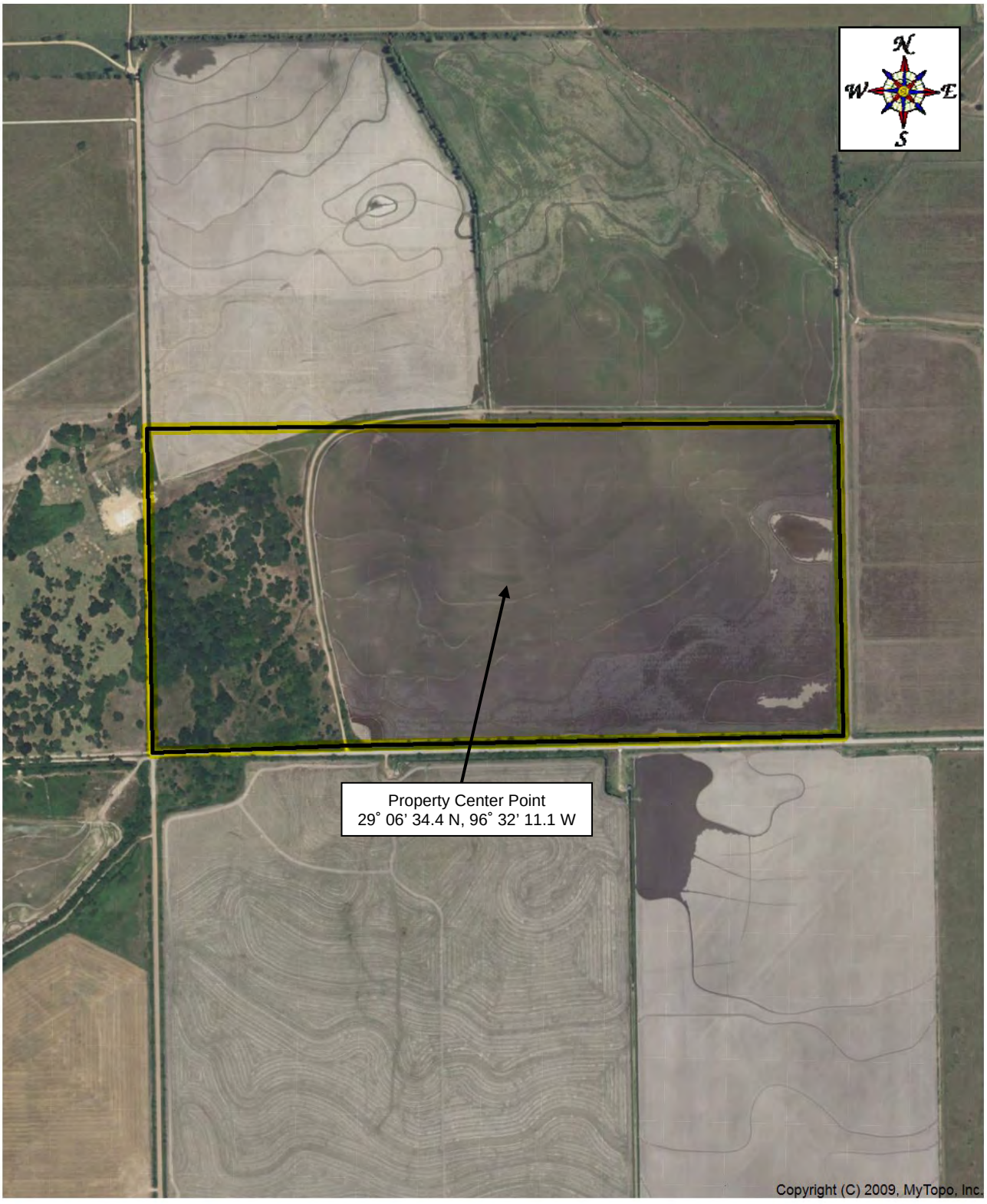
USGS 7.5' Quadrangle: GANADO, TX
Scale: 1:24,000

GAI
Gremminger and Associates, Inc.
environmental planning and permitting consultants

FIGURE: 2

DATE: 08/18/2011

GAI Project Number: 211155



ENERGY TRANSFER

Project Location Aerial Map
ETC Texas Pipeline LTD
Jackson County Gas Plant Project
Jackson County, Texas

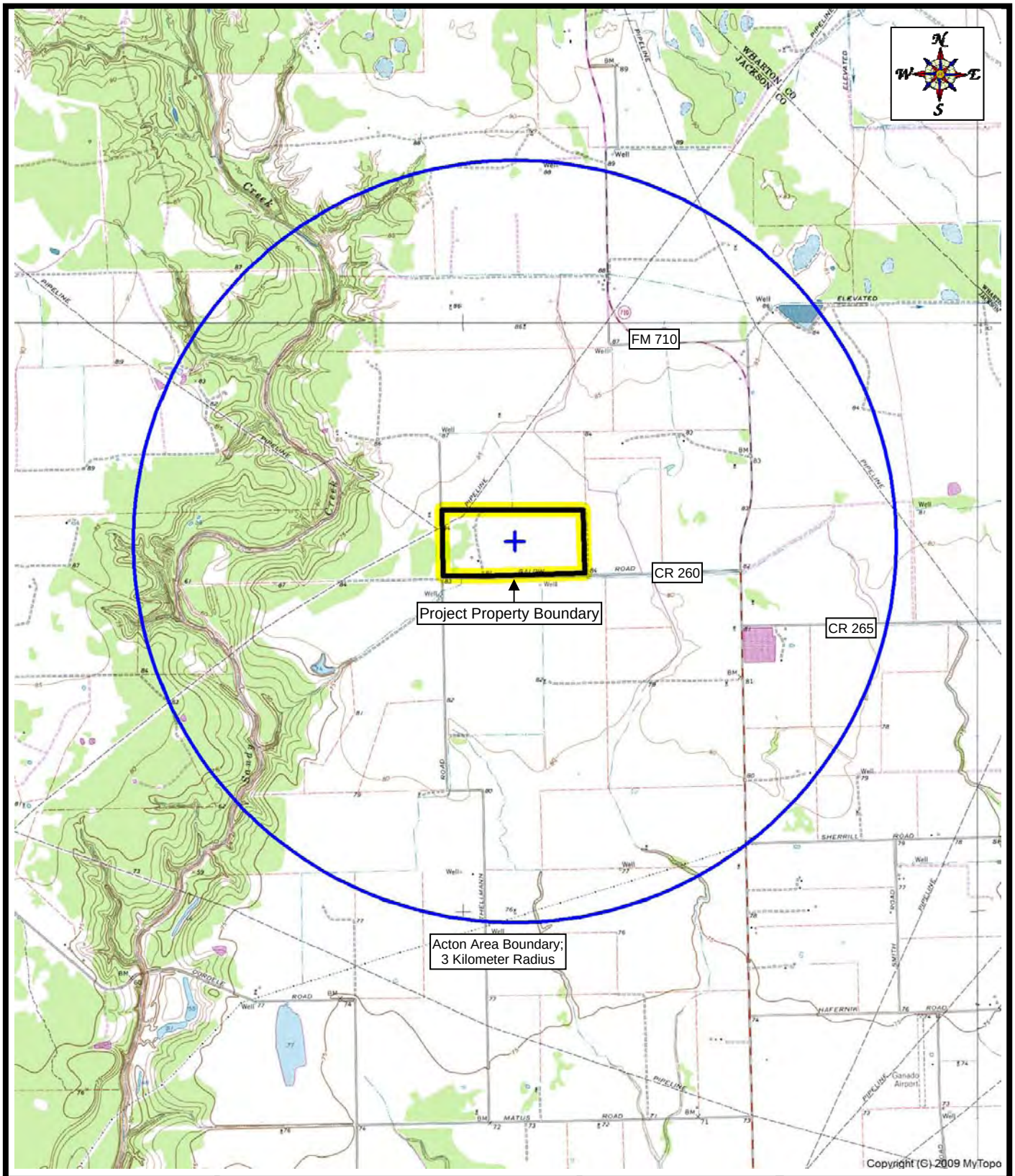
USGS 7.5' Quadrangle: GANADO, TX
Scale: 1:24,000

GAI
Gremminger and Associates, Inc.
environmental planning and permitting consultants

FIGURE: 3

DATE: 08/18/2011

GAI Project Number: 211155



ENERGY TRANSFER

Action Area Map
ETC Texas Pipeline, LTD
Jackson County Gas Plant
Jackson County, Texas

USGS 7.5-Minute Quadrangle:
Ganado, TX
Scale: 1:36,000

GAI
Gremminger and Associates, Inc.
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FIGURE: 4

DATE: 10/07/2011

GAI Project Number: 211155

APPENDIX A

PREVENTION OF SIGNIFICANT DETERIORATION AIR QUALITY ANALYSIS REPORT

Prevention of Significant Deterioration
Air Quality Analysis

ETC Texas Pipeline, Ltd.
Jackson County Gas Plant
Ganado, Jackson County, Texas

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November 2011
revision A

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1. INTRODUCTION AND PROJECT IDENTIFICATION INFORMATION

ETC Texas Pipeline, Ltd. (ETC) has applied to the Environmental Protection Agency (EPA) and to the Texas Commission on Environmental Quality (TCEQ) for authorization to construct four (4) natural gas processing plants and associated compression equipment (the Project) at the Jackson County Gas Plant (Site), which is located in Jackson County, Texas. Each of the four plants will be comprised of the following emission sources:

- two dual-drive inlet gas compressor engines,
- an amine unit, controlled by a thermal oxidizer,
- a cryogenic unit,
- a molecular sieve dehydration unit,
- three electric-driven refrigeration compressors,
- a triethylene glycol (TEG) dehydration unit, controlled by thermal oxidizer,
- three natural gas-fired residue gas compressor engines,
- three natural gas-fired heaters,
- storage tanks,
- fugitives from associated piping/equipment leaks, and
- engine blowdown and starter vents, which are controlled by a flare.

The Site's existing equipment includes a slug catcher, separators, condensate stabilization unit, condensate truck loading/unloading, two internal floating roof condensate tanks, fugitives from associated piping/equipment leaks, and a flare. The existing site is a liquids handling facility that separates liquids from the gas in the pipeline and stabilizes those liquids. The gas is piped off-site. This equipment is authorized by 30 Texas Administrative Code (TAC) §106.352 and §406.492. After the Project is operational, the residue gas from the existing liquids handling facility will be directed to the inlet of the four processing plants. ETC is requesting that the TCEQ incorporate by reference these PBR authorizations into the permit.

This air quality analysis (AQA) has been performed in accordance with the Texas Commission on Environmental Quality (TCEQ) Air Dispersion Modeling Team's (ADMT's) written and verbal guidance in support of the Project biological assessment/evaluation. The modeling analysis methodology and results are presented in this AQA Report.

In accordance with guidance, this AQA was performed for the Project criteria air pollutants for which the EPA has promulgated secondary National Ambient Air Quality Standards (NAAQS). The objectives of the AQA were to predict the maximum predicted Project impact for each criteria air pollutant and averaging period that has a secondary NAAQS and to determine whether that maximum predicted impact exceeds the associated Significant Impact Level (SIL) promulgated by the EPA. For those compounds and averaging periods for which the maximum predicted impact was above the respective SIL, the maximum radial distance for which the Project impact equals or exceeds the SIL was then determined and

the maximum predicted concentration was compared to the secondary NAAQS to evaluate compliance with the standard for application to the Project biological assessment/evaluation.

The AERMOD model , developed and recommended by EPA for refined modeling analyses such as this, was executed using the proposed Project emission rates and stack parameters for the following criteria air pollutants and associated averaging periods, for which EPA has promulgated secondary NAAQS and SILs:

- nitrogen dioxide **(NO_2):** annual
- particulate matter (PM) having an aerodynamic diameter of 10 microns or less **(PM_{10}):** 24-hour
- PM having an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$): 24-hour and annual
- SO_2**:** 3-hour

As discussed in Section 13 of this AQA Report, the AQA results demonstrate that the Plant's design impacts will be below all secondary NAAQS and the associated radii of significant impact will be 1 kilometer or less for the criteria air pollutants and averaging periods for which the maximum predicted Project impact is above the associated SIL.

Figure 4-1 in Section 4 of this AQA Report is an area map that shows the property boundaries and the surrounding region in Jackson County, Texas. Currently, Jackson County is designated as attainment/unclassifiable for all criteria air pollutants.

2. PROJECT OVERVIEW

The Plant will be located in a rural area near the municipality of Ganado, Jackson County, Texas in an area near the intersection of County Road 259 and County Road 260. Currently, Jackson County is designated as an attainment/ unclassifiable area for all criteria air pollutants.

As stated previously and as depicted on Figures 3-1 and 3-2, the Site location currently includes a Liquids Handling Facility, which is not being modified as part of the Project. This equipment is authorized by 30 TAC §106.352 and §106.492. ETC is requesting that the TCEQ incorporate by reference these PBR authorizations into the permit. The Liquids Handling Facility does not have any startup, shutdown, or maintenance-related emissions that would exceed normal operating emissions. Therefore, any final permitting limits on these sources will include periods of startup, shutdown, and maintenance, and no separate emission limit is necessary for these periods.

The Project includes the installation of four gas processing plants. The gas compressors are used to increase the pressure of the gas. As the gas travels through pipelines and the plant processes, the gas loses pressure or energy due to the friction on the pipe walls and/or as part of the process. Each of the four Plants is proposed to have two inlet compressors with dual-drive Caterpillar 3606 engines, three refrigeration compressors with electric-driven engines, and three residue compressors with gas-fired Caterpillar 3616 engines. Currently, dual-drive technology does not have a Caterpillar 3616 model available; therefore, ETC is only proposing dual-drive technology for the Caterpillar 3606 engines. Dual-drive technology allows the engines to be operated on either natural gas or electricity.

All engines have associated startup and shutdown emissions addressed in the application. Each inlet or residue engine has an associated starter vent, through which a small amount of natural gas is emitted during engine startup. These emissions are routed to the flare for combustion. Routing these emissions to the flare is environmentally beneficial because of the high destruction of VOC emissions, including methane. Given expected normal operations, each engine's startups are limited to 30 minutes, once per hour and 200 times per year for inlet/residue compression.

Each plant has two hot oil heaters that support the hot oil systems, including one rated at 48.45 million British thermal units per hour (MMBtu/hr) and one rated at 17.4 MMBtu/hr. Note that each plant's TEG dehydration unit uses heat provided by direct fire from a natural gas-fired heater rated at 3 MMBtu/hr. The hot oil systems result in emissions of VOC due to piping equipment leaks (i.e., fugitives). Also, the combustion of sweet natural gas in the hot oil heaters and TEG dehydration unit regenerator heaters results in combustion-related emissions. All heaters will be equipped with Next Generation Ultra-Low NO_X Burners (NGULNB).

Each Plant is equipped with an Amine Unit and associated thermal oxidizer. The Amine Unit flash tank emissions are recycled back into the plant process. The Amine Unit waste gas is routed to each Plant's respective thermal oxidizer. Each thermal oxidizer is designed to combust low-VOC concentration gas

and has a fuel rating of 7 MMBtu/hr, which keeps the temperature in the combustion chamber at or above 1,400 °F.

The TEG Dehydration Units use TEG to remove water from the gas. Rich glycol is routed from the glycol contactor towers to the glycol reboilers, where heat from dedicated regeneration heaters is used to drive off the water from the glycol. Lean glycol is then returned to the contactors for reuse. The rich glycol flash tanks are not vented to the atmosphere, but are routed back to the unit for reprocessing. The glycol regenerator still vent at each plant is routed to its respective thermal oxidizer for emission control.

From the TEG Units, the gas is routed to the molecular sieve dehydration units, where the water content is reduced further. The hot oil system heats a small amount of natural gas that is slip-streamed from the residue line as needed to regenerate the beds. The gas is then routed back into the system. There are four (4) beds in each molecular sieve, and one (1) bed is regenerated at a time. The molecular sieve units do not have vents to atmosphere. The residue gas from the beds that are regenerated is routed back to the residue gas stream. Therefore, the only emissions from these units are associated with fugitive piping/equipment leaks.

After the molecular sieve dehydration units, the propane-cooled cryogenic units remove heavier components to produce NGL by cooling the stream and reducing the stream pressure. The natural gas leaving the cryogenic unit is lean and dry (i.e., pipeline quality). The NGL liquids are transferred back to the Amine Units for processing prior to exiting the Site via pipeline. The only emissions from these units are associated with fugitive piping/equipment leaks.

The plants will use two 300-barrel produced water tanks (TK-3 and TK-4). Each Plant will have a 210-barrel tank for each of the following materials: amine, glycol, slop oil, waste oil, and lube oil. Each Plant will also have one pressure vessel for propane. Heat medium oil, lube oil, antifreeze/glycol, and amine will be received at the site via truck. Unloading emissions for these materials are accounted for in the working emissions for the respective tanks.

Fugitive emissions may result from piping equipment leaks. The piping that may leak includes valves, flanges, pump seals, etc. ETC will be implementing the TCEQ 28VHP Leak Detection and Repair (LDAR) program for the entire Site.

2.1 Type of Permit Review

This AQA and AQA Report m, performed in support of the biological assessment/evaluation, had three objectives: (1) to determine for which criteria air pollutants and averaging periods having an associated secondary NAAQS the maximum predicted Project impact exceeded the associated SIL, (2) for the pollutants and averaging periods having predicted post-Project criteria pollutant concentrations above the SIL, to determine the maximum radial distance to which the maximum predicted Project impact will equal or exceed the associated SIL, and (3) to demonstrate that the maximum predicted Project impact,

with an appropriate background concentration included, will comply with the associated secondary NAAQS..

Figure 2-1 shows the location of the Project with respect to the nearest Class I areas, which are all located more than 600 kilometers from the Project.

Project Preliminary Impact Determination modeling analyses were conducted for NO_2,, and $PM_{2.5}$ using five concatenated years of the TCEQ-specified meteorological data, for PM_{10} using five individual years of data and for SO_2 using one year of data
In this AQA Report, the terms "area of impact (i.e., AOI)" and "radius of impact (i.e., ROI)" have been used interchangeably. The analyses that were conducted are summarized below.

In order to predict the maximum SIL radial distances and footprints for application to the Project biological assessments/evaluation, the EPA-recommended AERMOD model was executed using the proposed Project emission rates and stack parameters for the following criteria air pollutants and associated averaging periods, for which EPA has promulgated secondary NAAQS and SILs:

- **NO_2:** annual
- **PM_{10}:** 24-hour
- **$PM_{2.5}$:** 24-hour and annual
- **SO_2:** 3-hour

The modeling analysis was conducted using the historical, long-term meteorological data sets that the TCEQ ADMT has prepared from hourly surface observations and twice daily mixing heights for the National Weather Service (NWS) surface and upper air station in Victoria, Texas.

The maximum predicted Project impacts exceed the applicable SILs only for **NO_2** (annual) and **$PM_{2.5}$** **(**24-hour and annual). In addition, the Project's ROI impact is equal to, or less than, 1 kilometer from the Project emissions sources for each associated criteria air pollutant/averaging period.

LEGEND

- *National Park Service*
- *Fish & Wildlife Service*
- *Forest Service*

N
W E
S

0 150 300
Kilometers

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FIGURE 2-1 CLASS 1 AREAS

Jackson County Gas Plant
ETC Texas Pipeline, Ltd.
TITAN Project No. 369-05
November 2011

Class 1 Receptor Data Courtesy
National Park Service
Digital Data Courtesy ESRI Online

3. PLOT PLAN

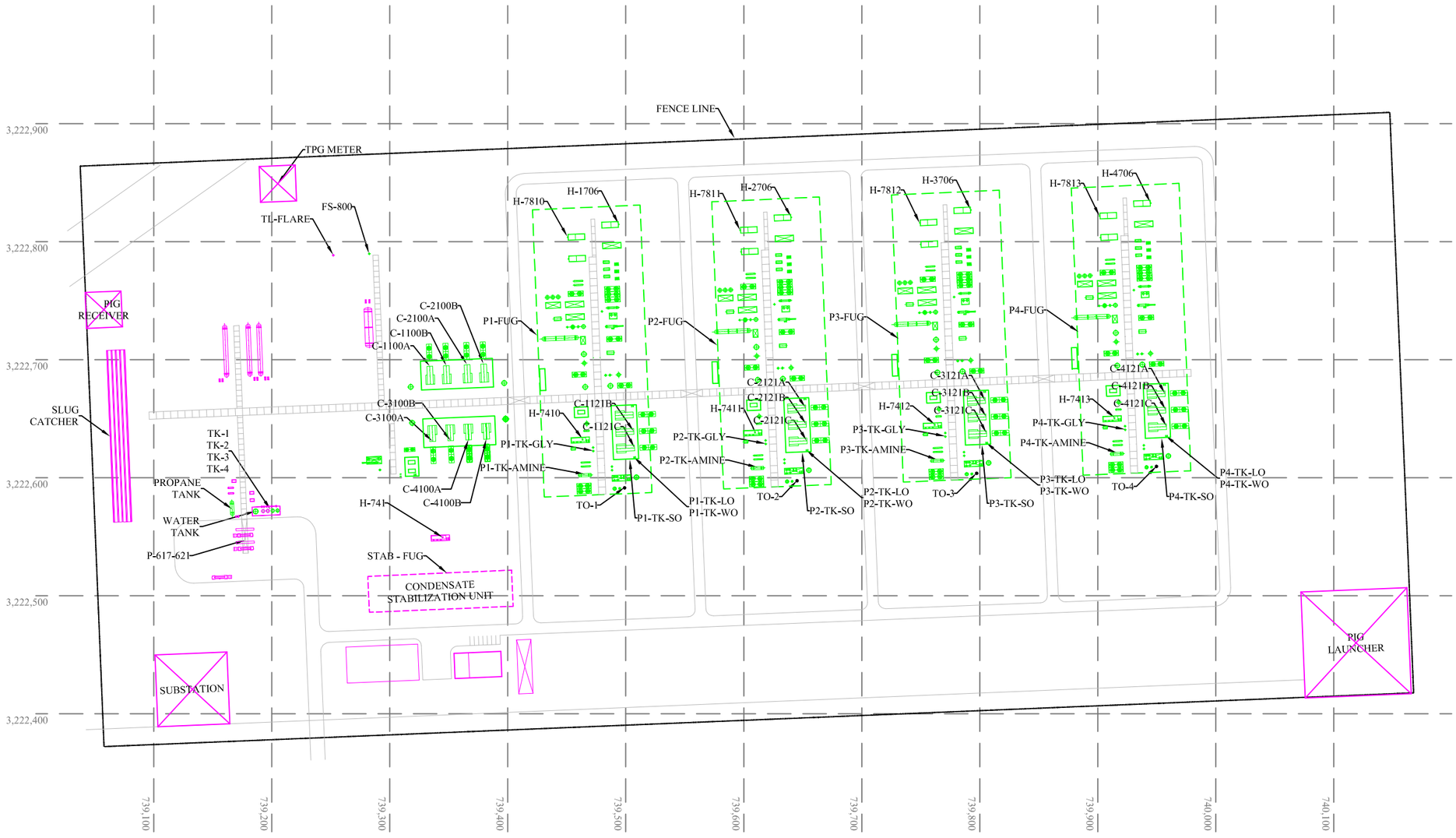
Figures 3-1 through 3-3 are plot plans of the Plant. Figure 3-1 contains the following TCEQ-requested information:

- true north arrow,
- map scale,
- general view of the Plant structures and emission points,
- 100-meter Universal Transverse Mercator (UTM) coordinate grid (UTM Zone 14, NAD83) labeled along the vertical and horizontal axes, and
- fence line.

Figure 3-2 is a plot plan close-up depicting the structures and emission points in expanded detail along with a 100-meter UTM grid.

Figure 3-3 was generated by the Surfer® graphics package using the Plant structure, emission point, and property/fence line UTM data that are inputs to the AERMOD analyses. Figure 3-3 depicts the Plant structure footprints, emission points (i.e., red-filled circles), and fence line along with UTM-gridded axes.

The Plant fence line is also depicted on the Area Map (i.e., Figure 4-1) and on the receptor distribution diagrams presented in Section 11of this AQA Report.



NOTES

Magenta denotes Existing Equipment

Green denotes Proposed Equipment

N

GRAPHIC SCALE

0 100m 200m

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FIGURE 3-1
PLOT PLAN

ENERGY TRANSFER

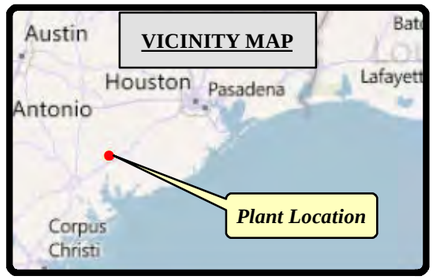
Jackson County Gas Plant
ETC Texas Pipeline, Ltd.
TITAN Project No. 369-05
November 2011

DESIGNED BY:	DETAILED BY:	CHECKED BY:
LLA	LWM	DG

FILE NAME: T:\EnergyTrans\JacksonCountyPermitting\Figures

DATE:	PROJECT NO.:	PLOT SCALE:
08/2011	369-05	1"=100 m

DRAWING NO.:	REVISION:	FIGURE:
TEI-36905-02	1	**2-4**



Site Boundary provided by Hatch Mott MacDonald as 141.0462 acre surface site sealed 4/18/2011, received 7/19/2011.

- *Magenta denotes Existing Equipment*
- *Green denotes Proposed Equipment*

N
W E
S

0 400 800
Feet

Grid Presented is NAD83, UTM 14N (meters)

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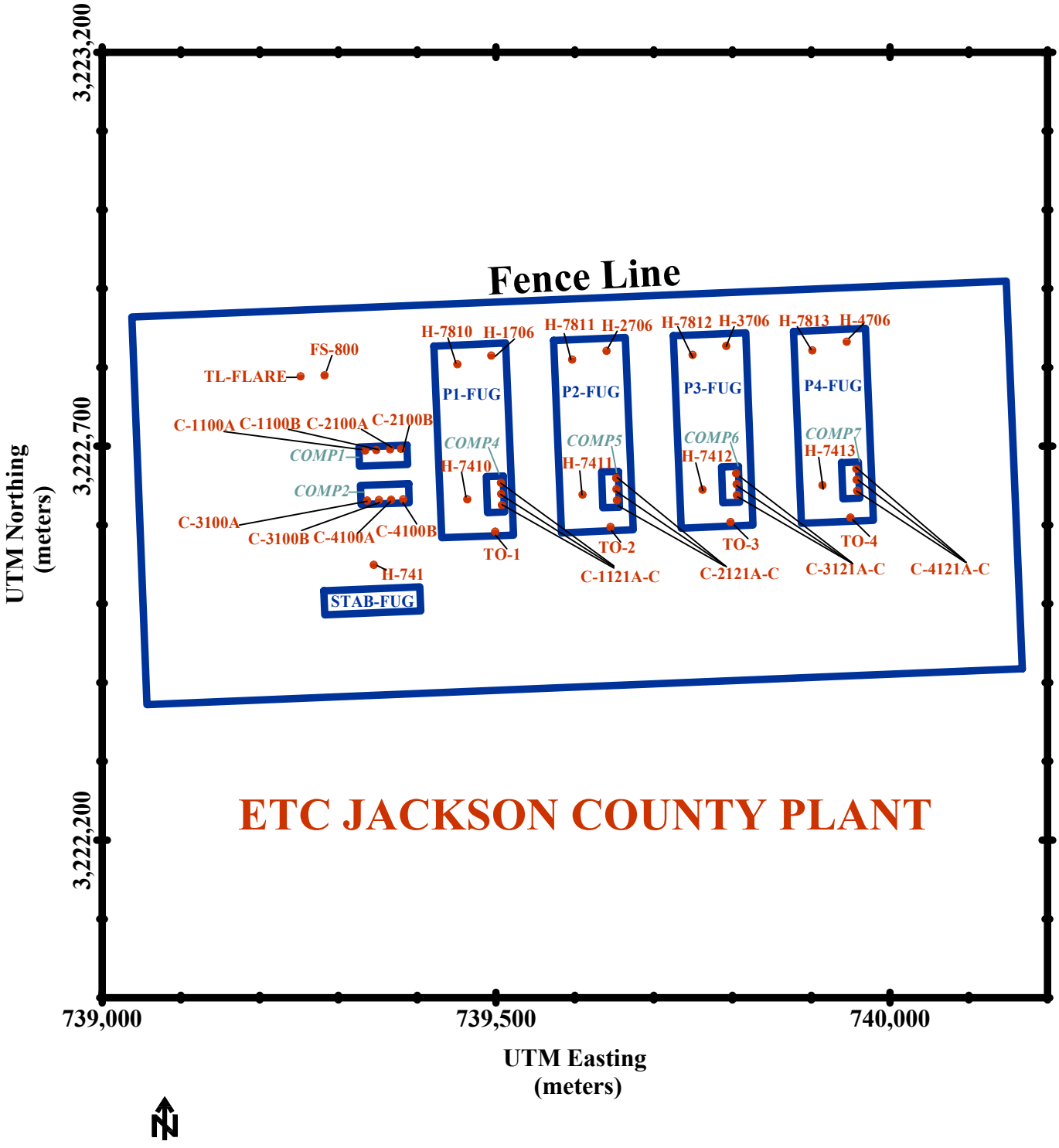
FIGURE 3-2
PLOT PLAN (Aerial)

Jackson County Gas Plant
ETC Texas Pipeline, Ltd.
TITAN Project No. 369-05
November 2011

from USGS Quadrangles Ganado NE & Ganado, Texas
Bing Map Ground Condition Depicted January 2009
Digital Data Courtesy ESRI Online



Red dots are ETC Jackson County Plant criteria air pollutant point sources.

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ENERGY TRANSFER

ETC TEXAS PIPELINE, LTD.
Jackson Couty Plant

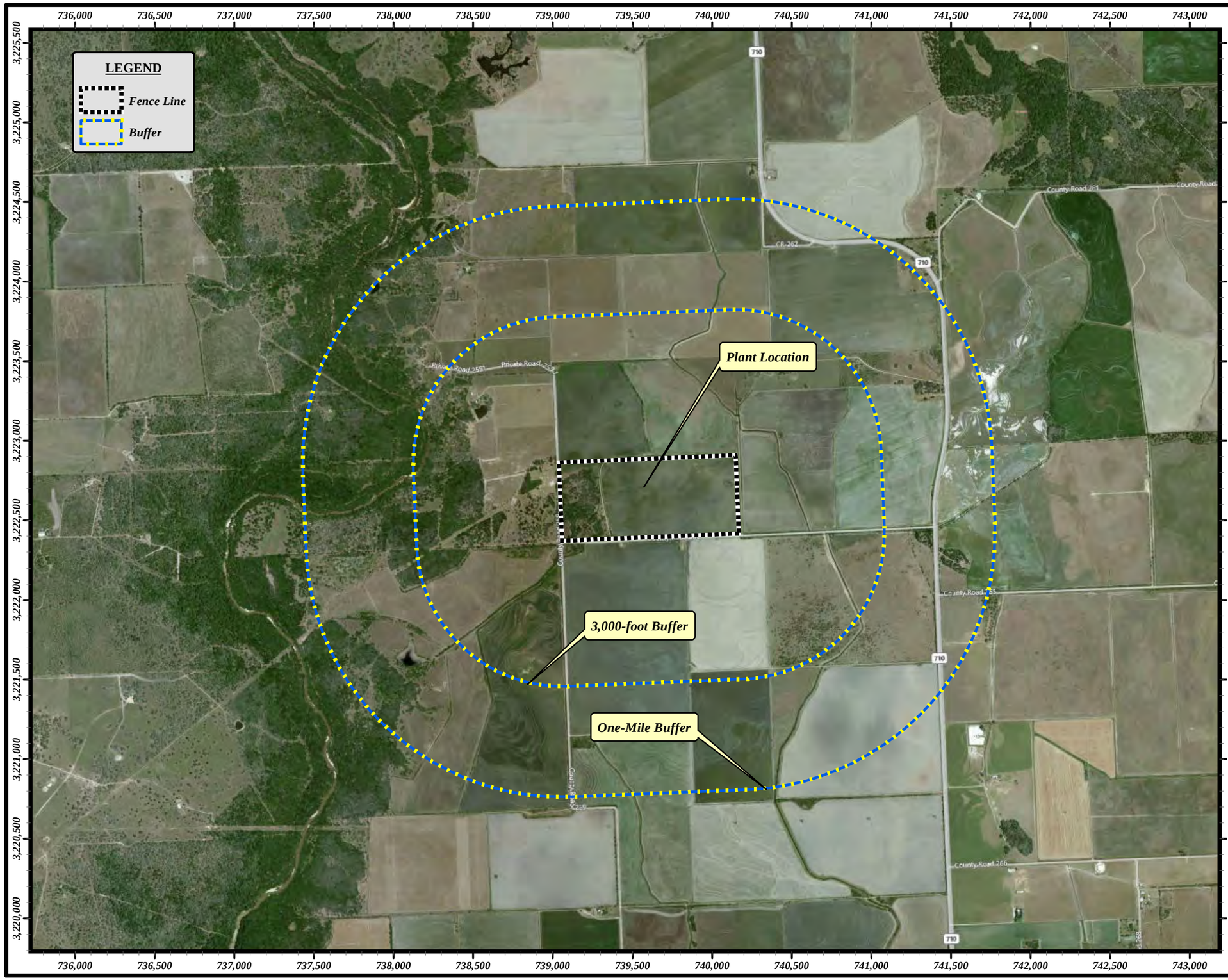
FIGURE 3-3
Plant Fence Line, Structures, and Criteria Air Pollutant Point Sources
November 2011

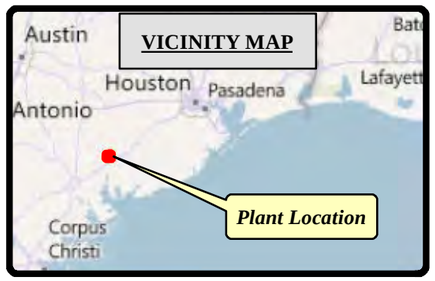
4. AREA MAP

Figure 4-1 is an area map that was prepared from an aerial photograph of the region and depicts the Project location, the fence line, and the surrounding land use. The area map also includes a 3,000-foot radius and a one-mile radius around the Plant boundary.

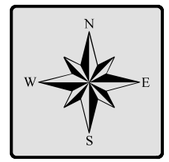
As Table F-1 of the TCEQ AQMG stipulates, Figure 4-1 includes the following items:

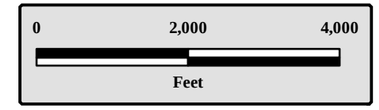
- 1,000-meter UTM coordinate labels (NAD83, UTM Zone 14) on the horizontal and vertical axes of the map section,
- the Plant property/fence lines,
- a depiction of the footprint of the 3,000-foot "radius" from the Plant property/fence line,
- a depiction of the footprint of the 1-mile "radius" from the Plant property/fence line,
- a map scale, and
- a true north arrow.





Site Boundary provided by Hatch Mott MacDonald as 141.0462 acre surface site sealed 4/18/2011, received 7/19/2011.





Grid Presented is NAD83, UTM 14N (meters)

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FIGURE 4-1 AREA MAP

Jackson County Gas Plant
ETC Texas Pipeline, Ltd.
TITAN Project No. 369-05
November 2011

from USGS Quadrangles Ganado NE & Ganado, Texas
Bing Map Ground Condition Depicted January 2009
Digital Data Courtesy ESRI Online

5. AIR QUALITY MONITORING DATA

Typically, background concentrations are added to the maximum AQA-predicted concentrations for combustion criteria air pollutants so that total concentrations (i.e., design concentrations) can be determined for comparison with the NAAQS. This section discusses the annual NO_2 and annual and 24-hour $PM_{2.5}$ (i.e., the criteria air pollutants for which maximum Project impacts were predicted to be above the respective SILs) ambient monitoring data that have been used in this AQA Report as background concentrations.

5.1 Ambient Monitoring Data

Table 5-1 summarizes the available representative ambient NO_2 and $PM_{2.5}$ monitoring data that have been used to characterize background concentrations for the Project area in this AQA Report. The Project area is relatively remote, so that the nearest available ambient monitoring data were collected at TCEQ Continuous Air Monitoring Stations (CAMS) that are not in the immediate Project region. However, the monitoring data that have been selected for characterizing the background air quality in the Project region have been thoroughly evaluated and satisfy all EPA/TCEQ data retrieval and data representativeness evaluation criteria, and are therefore representative, although on a conservative basis, of the Project area.

The NO_2 data were monitored at the Danciger, Texas CAMS 618 (Brazoria County) from 2008 through 2010. The $PM_{2.5}$ data were monitored at two CAMS sites: the CAMS 45 in Seabrook, Texas (Harris County) and the CAMS 38 near Leander, Texas (northwestern Travis County) from 2008 through 2010. Although the $PM_{2.5}$ monitoring data from both CAMS 38 and CAMS 45 are both conservative representations of the $PM_{2.5}$ air quality in the Project area, the CAMS 45 data have been used to characterize the background $PM_{2.5}$ concentrations in this AQA because the CAMS 45 data are slightly more conservative (i.e., have slightly higher concentrations) than the CAMS 38 data, and CAMS 45 somewhat closer to the Project region than is CAMS 38..

Figure 5-1 depicts the locations of the CAMS 618, 38, and 45, the Project, and Victoria, Texas, the source of the hourly surface and twice-daily upper air meteorological data that have been used in the AQA.

To evaluate the representativeness of the available ambient monitoring data with respect to the Project area, the procedures in the September 2, 1998 TCEQ ADMT technical memorandum entitled "*Background Concentration Determination for Use in NAAQS Analyses*" were followed, in accordance with verbal guidance provided by the TCEQ ADMT and as discussed in this section.. Specifically, the monitoring data evaluation procedures included (as stated in the TCEQ memorandum):

Step 2:

- *Obtain ambient monitoring data (from the TCEQ Internet web site)*
- *Determine if the data are complete by evaluating the number of observations taken.*

(NOTE: For this AQA Report, the ambient monitoring data collected during the three-year period from 2008 through 2010 were used.)

Step 3:

- *For sources located in the same general area as SLAMS, NAMS, PSD, or SPMS monitors, use the background concentration determined in Step 2. Compare the predicted concentration plus background concentration for each pollutant to the appropriate NAAQS. If the maximum concentrations are below the NAAQS, the demonstration is complete.*
- *For sources located outside the same general area of SLAMS, NAMS, PSD, or SPMS monitors, determine the county-wide point source emissions and population for the site under review. Find a SLAMS, NAMS, PSD, or SPMS monitor in an area with about the same or greater emissions and population, and similar topography. Use the procedures in Step 2 to determine a monitored concentration. Compare the predicted concentration plus background concentration for each pollutant to the appropriate NAAQS. If the maximum concentrations are below the NAAQS, the demonstration is complete.*

The following sections describe the CAMS site evaluation procedures with respect to the emissions and population comparisons between Jackson County and the counties having the CAMS.

5.1.1 Annual NO_2 Monitoring Data

Table 5-1 summarizes the ambient NO_2 monitoring data that have been used to characterize background annual NO_2 concentrations in this AQA. The data were monitored at the CAMS 618 in Danciger, Texas (western Brazoria County) from 2008 through 2010. As Figure 5-1 shows, the CAMS 618 site is located about 80 kilometers (50 miles) east of the Project region. As Table 5-2 shows, in 2002 (the most recent period for which emissions inventory data by county are routinely available), the NO_X emissions in Brazoria County were approximately eight times greater than the NO_X emissions in Jackson County. As Table 5-3 shows, the population of Brazoria County was a factor of twenty greater than the population of Jackson County in 2010. Considering the emissions and population comparisons, the CAMS 618 ambient NO_2 monitoring data are a conservative representation of the NO_2 background concentrations in Jackson County. As Table 5-1 shows, the three-year average NO_2 concentration at CAMS was 2.63 parts per billion (ppb), or 4.95 $\mu g/m^3$ This concentration has been used in this AQA Report as the background annual NO_2 concentration for incorporation into the annual NO_2 analysis.

5.1.2 Ambient $PM_{2.5}$ Monitoring Data

Table 5-1 summarizes the ambient $PM_{2.5}$ monitoring data that have been used to characterize background annual and 24-hour $PM_{2.5}$ concentrations in this AQA. The data were monitored at two locations: CAMS 45 in Seabrook, Texas (Harris County) and CAMS 38 near Leander, Texas (northwestern Travis County) from 2008 through 2010. As Figure 5-1 shows, the CAMS 45 site is located approximately 150

kilometers (approximately 90 miles) east-northeast of the Project region and the CAMS 38 site is located approximately 200 kilometers (approximately 120 miles) northwest of the Project region. As Table 5-4 shows, in 2002, the $PM_{2.5}$ emissions in both Harris and Travis Counties were much greater than the $PM_{2.5}$ emissions in Jackson County. As Table 5-3 shows, the populations of both Harris and Travis Counties were much greater than the population of Jackson County in 2010. Therefore, the data from both CAMS 45 and CAMS 38 are very conservative representations of the background $PM_{2.5}$ air quality in Jackson County.

Although the $PM_{2.5}$ monitoring data from both CAMS 38 and CAMS 45 are both conservative representations of the PM2.5 air quality in the Project area, the CAMS 45 data have been used to characterize the background $PM_{2.5}$ concentrations in this AQA because the CAMS 45 data are slightly more conservative (i.e., have slightly higher concentrations) than the CAMS 38 data and CAMS 45 is not as distant from the Project region as is CAMS 38.

As Table 5-1 shows, the three-year average annual $PM_{2.5}$ concentration at CAMS 45 was 10.14 µg/m³ and the three-year average 98th percentile $PM_{2.5}$ concentration at CAMS 45 was 20.13 µg/m³. These concentrations have been used in this AQA Report as the background annual and 24-hour $PM_{2.5}$ concentrations.

TABLE 5-1

NO_2 AND $PM_{2.5}$ AMBIENT AIR MONITORING DATA

ETC TEXAS PIPELINE, LTD., JACKSON COUNTY PLANT

Criteria Air Pollutant	Year of Monitored Data	EPA Monitor Site Identification Number	TCEQ CAMS	Monitoring Site Address/Location				Percentage Capture of 1-Hour Concentrations (%)	Annual		98th Percentile 24-Hour Concentration (µg/m³)	3-Year Average Design Annual Concentration (µg/m³)	3-Year Average Design 24-Hour 98th Percentile Concentration (µg/m³)
				Street Address	City	County	State		(ppb)	(µg/m³)			
NO_2[b]	2010	480390618	618	FM 1459 @ County Road 924	Danciger	Brazoria	Texas	96.3	2.7	5.1	N/A		
NO_2[b]	2009	480390618	618	FM 1459 @ County Road 924	Danciger	Brazoria	Texas	90.1	2.7	5.1	N/A	**4.95**[e]	**N/A**
NO_2[b]	2008	480390618	618	FM 1459 @ County Road 924	Danciger	Brazoria	Texas	91.1	2.5	4.7	N/A		
$PM_{2.5}$[c,d]	2010	482011050	45	4522 Park Road	Seabrook	Harris	Texas	95.5	N/A	10.0	19.7		
$PM_{2.5}$[c,d]	2009	482011050	45	4522 Park Road	Seabrook	Harris	Texas	96.9	N/A	10.19	23.5	**10.14**[f]	**22.0**[g]
$PM_{2.5}$[c,d]	2008	482011050	45	4522 Park Road	Seabrook	Harris	Texas	91.5	N/A	10.24	22.7		
$PM_{2.5}$[c,d]	2010	484530020	38	12200 Lime Creek Road	Leander	Travis	Texas	97.1	N/A	7.7	17.7		
$PM_{2.5}$[c,d]	2009	484530020	38	12200 Lime Creek Road	Leander	Travis	Texas	95.2	N/A	8.45	20.4	**8.38**[h]	**20.13**[h]
$PM_{2.5}$[c,d]	2008	484530020	38	12200 Lime Creek Road	Leander	Travis	Texas	98.4	N/A	9.0	22.3		

Source: TCEQ - Monitoring Report for Criteria Air Pollutants: on Internet web site (*http://www.tceq.texas.gov/cgi-bin/compliance/monops/yearly_summary.pl)*

[b] EPA Primary and Secondary Annual NAAQS for NO_2: 0.053 ppm = 100 µg/m³ (average of the three annual means over a 3-year monitoring period)

[c] EPA Primary and Secondary Annual NAAQS for $PM_{2.5}$: 15 µg/m³ (average of the three annual means over a 3-year monitoring period)

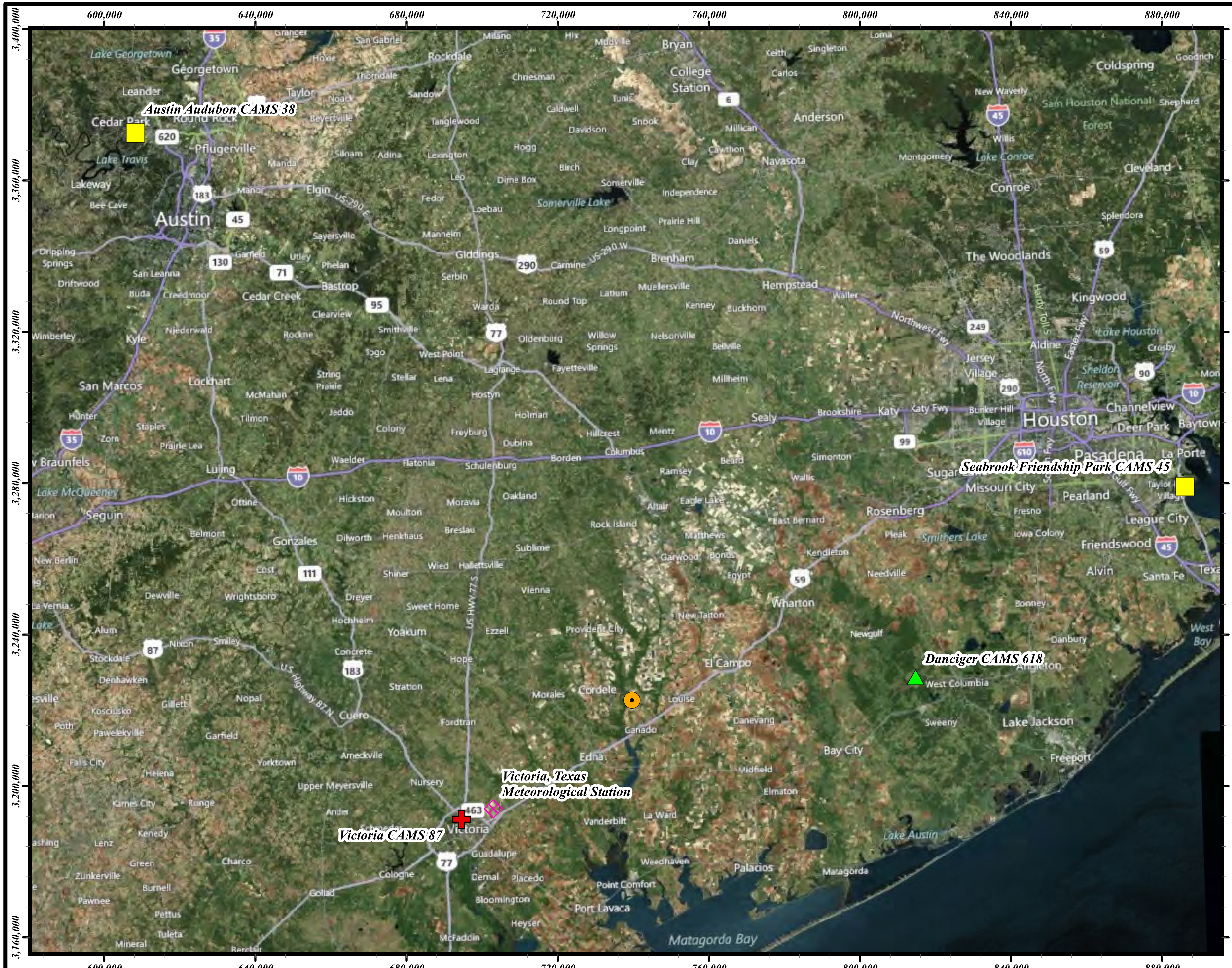
[d] EPA Primary and Secondary 24-Hour NAAQS for $PM_{2.5}$: 35 µg/m³ (average of the 98th percentile concentrations over a 3-year monitoring period)

[e] This three-year average annual NO_2 concentration (2.63 ppb = 4.95 µg/m³) was used to characterize the background annual NO_2 concentration for the Air Quality Analysis.

[f] This three-year average annual $PM_{2.5}$ concentration (10.14 µg/m³) was used to characterize the background annual $PM_{2.5}$ concentration for the Air Quality Analysis.

[g] This three-year average 98th percentile 24-hour $PM_{2.5}$ concentration (22.0 µg/m³) was used to characterize the background 24-hour $PM_{2.5}$ concentration for the Air Quality Analysis.

[h] The CAMS 38 ambient $PM_{2.5}$ monitoring data are presented for purposes of comparison with the CAMS 45 $PM_{2.5}$ monitoring data, to demonstrate the similarity of the background $PM_{2.5}$ concentrations in the region. The CAMS 45 $PM_{2.5}$ monitoring data were used to characterize the background $PM_{2.5}$ concentrations in the Air Quality Analysis because the CAMS 45 data averages are slightly higher than the CAMS 38 data averages (i.e., the CAMS 45 data are slightly conservative).



Legend

- Energy Transfer Jackson County Facility
- Meteorological Station
- PM2.5 Monitor
- Ozone Monitor
- Nitrogen Dioxide Monitor

N E S W

0 16 32 Miles

Grid Presented is NAD83, UTM 14N (meters)

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FIGURE 5-1
AMBIENT MONITORING STATIONS IN THE PROJECT REGION

Jackson County Plant
ETC Texas Pipeline, Ltd.
TITAN Project No. 369-05
November 2011

Ground Condition Depicted 2010
Digital Data Courtesy of ESRI Online Datasets

TABLE 5-2

SUMMARY OF 2002 NO_X EMISSIONS FOR JACKSON and BRAZORIA COUNTIES

ETC TEXAS PIPELINE, LTD., JACKSON COUNTY PLANT

	Jackson County[b]		Brazoria County[b]	
Tier -1 Emission Category[a]	**Area Source Emissions (tons/year)**	**Point Source Emissions (tons/year)**	**Area Source Emissions (tons/year)**	**Point Source Emissions (tons/year)**
01-Fuel Comb. Elec. Util,	53.00	2860.00	0.00	2839.00
02-Fuel Comb. Industrial	-	-	450.00	15886.00
03-Fuel Comb. Other	11.10	0.00	171.00	81.40
04-Chemical and Allied Product Mfg.	-	-	0.00	1223.00
05-Metals Processing	-	-	-	-
06-Petroleum and Related Industries	657.00	0.79	1480.00	806.00
07-Other Industrial Processes	-	-	0.00	0.06
08-Solvent Utilization	-	-	0.00	0.01
09-Storage & Transport	-	-	0.00	3.82
10-Waste Disposal and Recycling	1.32	0.00	8.43	11.90
11-Highway Vehicles	1342.00	0.00	4183.00	0.00
12-Off-Highway	624.00	0.00	16980.00	0.00
14-Miscellaneous	6.79	0.00	4.51	0.00
Total Source-Type Annual Emissions for the County (tons/year)	2695.21	2860.79	23276.94	20851.19
Total Annual Emissions for the County (tons/year)	**5556.00**		**44128.13**	

[a] Tier-1 (criteria air pollutants) emission category nomenclature from U.S. Environmental Protection Agency (EPA) AirData Internet web site. (http://iaspub.epa.gov/airsdata/adnet.tier?geotype=st&geocode=TX&geoinfo=st%7ETX%7ETexas&pol=NOX&year=2002&fld=state&fld=county&fld=ti

[b] NO_X emission data in tons/year for the 2002 data year from the U.S. EPA AirData Internet web site.

TABLE 5-3

COUNTY POPULATION SUMMARY

ETC TEXAS PIPELINE, LTD., JACKSON COUNTY PLANT

	County			
Year	**Brazoria**	**Harris**	**Jackson**	**Travis**
2000[a]	241,767	3,400,578	14,391	812,280
2005[a]	276,956	3,693,816	14,476	896,753
2006[a]	286,773	3,830,130	14,559	928,037
2007[a]	293,315	3,891,420	14,732	947,215
2008[a]	301,011	3,965,716	14,840	988,312
2009[a]	308,890	4,044,032	14,862	1,012,789
2010[b]	319,043	4,096,052	15,360	992,773

[a] 2000, 2005, 2006, 2007, 2008, and 2009 population estimates from the Texas Department of State Health Services Internet web site.
(http://www.dshs.state.tx.us/CHS/Popdat)

[b] 2010 population projection from the Texas Department of State Health Services Internet web site.
(http://www.dshs.state.tx.us/CHS/Popdat)

TABLE 5-4

SUMMARY OF 2002 PM2.5 EMISSIONS FOR JACKSON, TRAVIS AND HARRIS COUNTIES

ETC TEXAS PIPELINE, LTD., JACKSON COUNTY PLANT

	Jackson County[b]		Travis County[b]		Harris County[b]	
Tier -1 Emission Category[a]	**Area Source Emissions (tons/year)**	**Point Source Emissions (tons/year)**	**Area Source Emissions (tons/year)**	**Point Source Emissions (tons/year)**	**Area Source Emissions (tons/year)**	**Point Source Emissions (tons/year)**
01-Fuel Comb. Elec. Util,	-	-	0	84.2	0	423
02-Fuel Comb. Industrial	10.10	42.10	339	7.47	918	1948
03-Fuel Comb. Other	24.10	0.00	199	0.12	852	125
04-Chemical and Allied Product Mfg.	-	-	0	0	0	356
05-Metals Processing	-	-	0	0	0	69.2
06-Petroleum and Related Industries	0.00	0.02	0	0.28	0	877
07-Other Industrial Processes	67.10	0.00	355	316	1193	1314
08-Solvent Utilization	-	-	0	0	0	55.5
09-Storage & Transport	-	-	0	31	0	84.3
10-Waste Disposal and Recycling	29.80	0.00	244	20.1	1840	140
11-Highway Vehicles	31.10	0.00	331	0	1334	0
12-Off-Highway	48.70	0.00	571	0	4267	0
14-Miscellaneous	625.00	0.00	5,969	0	13061	0
Total Source-Type Annual Emissions for the County (tons/year)	835.90	42.12	8,008.00	459.17	23465.00	5392.00
Total Annual Emissions for the County (tons/year)	**878.02**		**8467.17**		**28857.00**	

[a] Tier-1 (criteria air pollutants) emission category nomenclature from U.S. Environmental Protection Agency (EPA) AirData Internet web site. (http://iaspub.epa.gov/airsdata/adnet.tier?geotype=st&geocode=TX&geoinfo=st%7ETX%7ETexas&pol=PM25&year=2002&fld=state&fld=county&fld=tier1&rpp=2133&page=1&sort=a3&fmt=

[b] $PM_{2.5}$ emission data in tons/year for the 2002 data year from the U.S. EPA AirData Internet web site.

6. MODELING EMISSIONS INVENTORY

This section presents stack parameters and emission rates for the Project sources to be permitted that have been modeled in this AQA.

Table 6-1 is a copy of the Table 1(a) that was submitted with the Permit Application. The Project EPNs listed on the Table 1(a) have also been used in the AQA.

Table 6-2 lists the Project source UTM coordinates (in NAD83, UTM Zone 14), stack base elevations (in feet and meters above mean sea level [msl]) and source parameters, in metric and English units Figure 6-1 depicts the Project source locations and downwash structure footprints. Table 6-3 lists the emission rates for each Project source that have been included in the modeling analyses.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number:	TBD	RN Number:	TBD	Date:	September-11
Company Name:	ETC Texas Pipeline, Ltd. - Jackson County Gas Plant				

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			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate [a]		4. UTM Coordinates of Emission Point			5. Building Height (ft)	Source 6. Height Above Ground (ft)	7. Stack Exit Data			8. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (meters)	North (meters)			Diameter (ft) (A)	Velocity (fps) (B)	Tempera-ture (°F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
C-1100A	C-1100A	Plant 1 Inlet Compressor 1 (3606) (Normal)	CO	0.74	--	14	739,333.7	3,222,694.6	--	50.0	2.0	62.1	800	--	--	--
			NO_X	1.96	--											
			PM	0.13	--											
			SO_2	0.01	--											
			VOC	1.06	--											
			CH_2O	0.08	--											
C-1100A	C-1100A	Plant 1 Inlet Compressor 1 (3606) (Burn-In)	CO	10.76	--	14	739,333.7	3,222,694.6	--	50.0	2.0	62.1	800	--	--	--
			NO_X	1.96	--											
			PM	0.13	--											
			SO_2	0.01	--											
			VOC	3.48	--											
			CH_2O	1.02	--											
C-1100B	C-1100B	Plant 1 Inlet Compressor 2 (3606) (Normal)	CO	0.74	--	14	739,347.8	3,222,695.1	--	50.0	2.0	62.1	800	--	--	--
			NO_X	1.96	--											
			PM	0.13	--											
			SO_2	0.01	--											
			VOC	1.06	--											
			CH_2O	0.08	--											
C-1100B	C-1100B	Plant 1 Inlet Compressor 2 (3606) (Burn-In)	CO	10.76	--	14	739,347.8	3,222,695.1	--	50.0	2.0	62.1	800	--	--	--
			NO_X	1.96	--											
			PM	0.13	--											
			SO_2	0.01	--											
			VOC	3.48	--											
			CH_2O	1.02	--											
C-2100A	C-2100A	Plant 2 Inlet Compressor 1 (3606) (Normal)	CO	0.74	260.83	14	739,365.4	3,222,696.0	--	50.0	2.0	62.1	800	--	--	--
			NO_X	1.96	113.13											
			PM	0.13	30.38											
			SO_2	0.01	28.90											
			VOC	1.06	219.71											
			CH_2O	0.08	14.55											
C-2100A	C-2100A	Plant 2 Inlet Compressor 1 (3606) (Burn-In)	CO	10.76	--	14	739,365.4	3,222,696.0	--	50.0	2.0	62.1	800	--	--	--
			NO_X	1.96	--											
			PM	0.13	--											
			SO_2	0.01	--											
			VOC	3.48	--											
			CH_2O	1.02	--											

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number:	TBD	RN Number:	TBD	Date:	September-11
Company Name:	ETC Texas Pipeline, Ltd. - Jackson County Gas Plant				

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			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate [a]		4. UTM Coordinates of Emission Point			5. Building Height (ft)	Source					
										6. Height Above Ground (ft)	7. Stack Exit Data			8. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (meters)	North (meters)			Diameter (ft) (A)	Velocity (fps) (B)	Tempera-ture (°F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
C-2100B	C-2100B	Plant 2 Inlet Compressor 2 (3606) (Normal)	CO	0.74	--	14	739,379.3	3,222,696.5	--	50.0	2.0	62.1	800	--	--	--
			NO_X	1.96	--											
			PM	0.13	--											
			SO_2	0.01	--											
			VOC	1.06	--											
			CH_2O	0.08	--											
C-2100B	C-2100B	Plant 2 Inlet Compressor 2 (3606) (Burn-In)	CO	10.76	--	14	739,379.3	3,222,696.5	--	50.0	2.0	62.1	800	--	--	--
			NO_X	1.96	--											
			PM	0.13	--											
			SO_2	0.01	--											
			VOC	3.48	--											
			CH_2O	1.02	--											
C-3100A	C-3100A	Plant 3 Inlet Compressor 1 (3606) (Normal)	CO	0.74	--	14	739,336.4	3,222,631.1	--	50.0	2.0	62.1	800	--	--	--
			NO_X	1.96	--											
			PM	0.13	--											
			SO_2	0.01	--											
			VOC	1.06	--											
			CH_2O	0.08	--											
C-3100A	C-3100A	Plant 3 Inlet Compressor 1 (3606) (Burn-In)	CO	10.76	--	14	739,336.4	3,222,631.1	--	50.0	2.0	62.1	800	--	--	--
			NO_X	1.96	--											
			PM	0.13	--											
			SO_2	0.01	--											
			VOC	3.48	--											
			CH_2O	1.02	--											
C-3100B	C-3100B	Plant 3 Inlet Compressor 2 (3606) (Normal)	CO	0.74	--	14	739,351.5	3,222,631.6	--	50.0	2.0	62.1	800	--	--	--
			NO_X	1.96	--											
			PM	0.13	--											
			SO_2	0.01	--											
			VOC	1.06	--											
			CH_2O	0.08	--											
C-3100B	C-3100B	Plant 3 Inlet Compressor 2 (3606) (Burn-In)	CO	10.76	--	14	739,351.5	3,222,631.6	--	50.0	2.0	62.1	800	--	--	--
			NO_X	1.96	--											
			PM	0.13	--											
			SO_2	0.01	--											
			VOC	3.48	--											
			CH_2O	1.02	--											

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number:	TBD	RN Number:	TBD	Date:	September-11
Company Name:	ETC Texas Pipeline, Ltd. - Jackson County Gas Plant				

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			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate [a]		4. UTM Coordinates of Emission Point			5. Building Height (ft)	Source 6. Height Above Ground (ft)	7. Stack Exit Data			8. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (meters)	North (meters)			Diameter (ft) (A)	Velocity (fps) (B)	Tempera-ture (°F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
C-4100A	C-4100A	Plant 4 Inlet Compressor 1 (3606) (Normal)	CO	0.74	--	14	739,366.9	3,222,632.0	--	50.0	2.0	62.1	800	--	--	--
			NO_X	1.96	--											
			PM	0.13	--											
			SO_2	0.01	--											
			VOC	1.06	--											
			CH_2O	0.08	--											
C-4100A	C-4100A	Plant 4 Inlet Compressor 1 (3606) (Burn-In)	CO	10.76	--	14	739,366.9	3,222,632.0	--	50.0	2.0	62.1	800	--	--	--
			NO_X	1.96	--											
			PM	0.13	--											
			SO_2	0.01	--											
			VOC	3.48	--											
			CH_2O	1.02	--											
C-4100B	C-4100B	Plant 4 Inlet Compressor 2 (3606) (Normal)	CO	0.74	--	14	739,382.1	3,222,632.6	--	50.0	2.0	62.1	800	--	--	--
			NO_X	1.96	--											
			PM	0.13	--											
			SO_2	0.01	--											
			VOC	1.06	--											
			CH_2O	0.08	--											
C-4100B	C-4100B	Plant 4 Inlet Compressor 2 (3606) (Burn-In)	CO	10.76	--	14	739,382.1	3,222,632.6	--	50.0	2.0	62.1	800	--	--	--
			NO_X	1.96	--											
			PM	0.13	--											
			SO_2	0.01	--											
			VOC	3.48	--											
			CH_2O	1.02	--											
C-1100A/B, C-2100A/B, C-3100A/B, & C-4100A/B	C-1100A/B, C-2100A/B, C-3100A/B, & C-4100A/B	All Inlet Compressors Combined Annual Operations (28,000 hrs/yr Total) (Includes Normal and MSS Operations)	CO	--	15.33	14	--	--	--	--	--	--	--	--	--	--
			NO_X	--	27.44											
			PM	--	1.82											
			SO_2	--	0.14											
			VOC	--	16.04											
			CH_2O	--	1.59											
C-1121A	C-1121A	Plant 1 Residue Compressor 1 (3616) (Annual Limits include Normal and MSS Operations)	CO	1.98	10.17	14	739,506.1	3,222,653.5	--	70.0	2.5	101.3	800	--	--	--
			NO_X	0.52	2.73											
			PM	0.35	1.53											
			SO_2	0.03	0.13											
			VOC	2.82	12.75											
			CH_2O	0.21	1.07											
			NH_3	0.84	3.68											

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number:	TBD	RN Number:	TBD	Date:	September-11
Company Name:	ETC Texas Pipeline, Ltd. - Jackson County Gas Plant				

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			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate [a]		4. UTM Coordinates of Emission Point			5. Building Height (ft)	Source							
										6. Height Above Ground (ft)	7. Stack Exit Data			8. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (meters)	North (meters)			Diameter (ft) (A)	Velocity (fps) (B)	Tempera-ture (°F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
C-1121A	C-1121A	Plant 1 Residue Compressor 1 (3616) (Burn-In)	CO	26.10	--	14	739,506.1	3,222,653.5	--	70.0	2.5	101.3	800	--	--	--
			NO_X	5.22	--											
			PM	0.35	--											
			SO_2	0.03	--											
			VOC	9.29	--											
			CH_2O	2.71	--											
			NH_3	--	--											
C-1121A	C-1121A	Plant 1 Residue Compressor 1 (3616) (Start Up)	CO	1.98	--	14	739,506.1	3,222,653.5	--	70.0	2.5	101.3	800	--	--	--
			NO_X	2.09	--											
			PM	0.35	--											
			SO_2	0.03	--											
			VOC	2.82	--											
			CH_2O	0.21	--											
			NH_3	--	--											
C-1121B	C-1121B	Plant 1 Residue Compressor 2 (3616) (Annual Limits include Normal and MSS Operations)	CO	1.98	10.17	14	739,506.6	3,222,639.4	--	70.0	2.5	101.3	800	--	--	--
			NO_X	0.52	2.73											
			PM	0.35	1.53											
			SO_2	0.03	0.13											
			VOC	2.82	12.75											
			CH_2O	0.21	1.07											
			NH_3	0.84	3.68											
C-1121B	C-1121B	Plant 1 Residue Compressor 2 (3616) (Burn-In)	CO	26.10	--	14	739,506.6	3,222,639.4	--	70.0	2.5	101.3	800	--	--	--
			NO_X	5.22	--											
			PM	0.35	--											
			SO_2	0.03	--											
			VOC	9.29	--											
			CH_2O	2.71	--											
			NH_3	--	--											
C-1121B	C-1121B	Plant 1 Residue Compressor 2 (3616) (Start Up)	CO	1.98	--	14	739,506.6	3,222,639.4	--	70.0	2.5	101.3	800	--	--	--
			NO_X	2.09	--											
			PM	0.35	--											
			SO_2	0.03	--											
			VOC	2.82	--											
			CH_2O	0.21	--											
			NH_3	--	--											

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number:	TBD	RN Number:	TBD	Date:	September-11
Company Name:	ETC Texas Pipeline, Ltd. - Jackson County Gas Plant				

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			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate [a]		4. UTM Coordinates of Emission Point			5. Building Height (ft)	Source							
										6. Height Above Ground (ft)	7. Stack Exit Data			8. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (meters)	North (meters)			Diameter (ft) (A)	Velocity (fps) (B)	Tempera-ture (°F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
C-1121C	C-1121C	Plant 1 Residue Compressor 3 (3616) (Annual Limits include Normal and MSS Operations)	CO	1.98	10.17	14	739,507.3	3,222,625.5	--	70.0	2.5	101.3	800	--	--	--
			NO_X	0.52	2.73											
			PM	0.35	1.53											
			SO_2	0.03	0.13											
			VOC	2.82	12.75											
			CH_2O	0.21	1.07											
			NH_3	0.84	3.68											
C-1121C	C-1121C	Plant 1 Residue Compressor 3 (3616) (Burn-In)	CO	26.10	--	14	739,507.3	3,222,625.5	--	70.0	2.5	101.3	800	--	--	--
			NO_X	5.22	--											
			PM	0.35	--											
			SO_2	0.03	--											
			VOC	9.29	--											
			CH_2O	2.71	--											
			NH_3	--	--											
C-1121C	C-1121C	Plant 1 Residue Compressor 3 (3616) (Start Up)	CO	1.98	--	14	739,507.3	3,222,625.5	--	70.0	2.5	101.3	800	--	--	--
			NO_X	2.09	--											
			PM	0.35	--											
			SO_2	0.03	--											
			VOC	2.82	--											
			CH_2O	0.21	--											
			NH_3	--	--											
C-2121A	C-2121A	Plant 2 Residue Compressor 1 (3616) (Annual Limits include Normal and MSS Operations)	CO	1.98	10.17	14	739,652.4	3,222,659.5	--	70.0	2.5	101.3	800	--	--	--
			NO_X	0.52	2.73											
			PM	0.35	1.53											
			SO_2	0.03	0.13											
			VOC	2.82	12.75											
			CH_2O	0.21	1.07											
			NH_3	0.84	3.68											
C-2121A	C-2121A	Plant 2 Residue Compressor 1 (3616) (Burn-In)	CO	26.10	--	14	739,652.4	3,222,659.5	--	70.0	2.5	101.3	800	--	--	--
			NO_X	5.22	--											
			PM	0.35	--											
			SO_2	0.03	--											
			VOC	9.29	--											
			CH_2O	2.71	--											
			NH_3	--	--											

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number:	TBD	RN Number:	TBD	Date:	September-11
Company Name:	ETC Texas Pipeline, Ltd. - Jackson County Gas Plant				

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			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate [a]		4. UTM Coordinates of Emission Point			5. Building Height (ft)	Source							
										6. Height Above Ground (ft)	7. Stack Exit Data			8. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (meters)	North (meters)			Diameter (ft) (A)	Velocity (fps) (B)	Tempera-ture (°F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
C-2121A	C-2121A	Plant 2 Residue Compressor 1 (3616) (Start Up)	CO	1.98	--	14	739,652.4	3,222,659.5	--	70.0	2.5	101.3	800	--	--	--
			NO_X	2.09	--											
			PM	0.35	--											
			SO_2	0.03	--											
			VOC	2.82	--											
			CH_2O	0.21	--											
			NH_3	--	--											
C-2121B	C-2121B	Plant 2 Residue Compressor 2 (3616) (Annual Limits include Normal and MSS Operations)	CO	1.98	10.17	14	739,652.9	3,222,645.5	--	70.0	2.5	101.3	800	--	--	--
			NO_X	0.52	2.73											
			PM	0.35	1.53											
			SO_2	0.03	0.13											
			VOC	2.82	12.75											
			CH_2O	0.21	1.07											
			NH_3	0.84	3.68											
C-2121B	C-2121B	Plant 2 Residue Compressor 2 (3616) (Burn-In)	CO	26.10	--	14	739,652.9	3,222,645.5	--	70.0	2.5	101.3	800	--	--	--
			NO_X	5.22	--											
			PM	0.35	--											
			SO_2	0.03	--											
			VOC	9.29	--											
			CH_2O	2.71	--											
			NH_3	--	--											
C-2121B	C-2121B	Plant 2 Residue Compressor 2 (3616) (Start Up)	CO	1.98	--	14	739,652.9	3,222,645.5	--	70.0	2.5	101.3	800	--	--	--
			NO_X	2.09	--											
			PM	0.35	--											
			SO_2	0.03	--											
			VOC	2.82	--											
			CH_2O	0.21	--											
			NH_3	--	--											
C-2121C	C-2121C	Plant 2 Residue Compressor 3 (3616) (Annual Limits include Normal and MSS Operations)	CO	1.98	10.17	14	739,653.4	3,222,631.5	--	70.0	2.5	101.3	800	--	--	--
			NO_X	0.52	2.73											
			PM	0.35	1.53											
			SO_2	0.03	0.13											
			VOC	2.82	12.75											
			CH_2O	0.21	1.07											
			NH_3	0.84	3.68											

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number:	**TBD**	RN Number:	**TBD**	Date:	**September-11**
Company Name:	**ETC Texas Pipeline, Ltd. - Jackson County Gas Plant**				

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			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate [a]		4. UTM Coordinates of Emission Point			5. Building Height (ft)	Source							
										6. Height Above Ground (ft)	7. Stack Exit Data			8. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (meters)	North (meters)			Diameter (ft) (A)	Velocity (fps) (B)	Tempera-ture (°F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
C-2121C	C-2121C	Plant 2 Residue Compressor 3 (3616) (Burn-In)	CO	26.10	--	14	739,653.4	3,222,631.5	--	70.0	2.5	101.3	800	--	--	--
			NO_X	5.22	--											
			PM	0.35	--											
			SO_2	0.03	--											
			VOC	9.29	--											
			CH_2O	2.71	--											
			NH_3	--	--											
C-2121C	C-2121C	Plant 2 Residue Compressor 3 (3616) (Start Up)	CO	1.98	--	14	739,653.4	3,222,631.5	--	70.0	2.5	101.3	800	--	--	--
			NO_X	2.09	--											
			PM	0.35	--											
			SO_2	0.03	--											
			VOC	2.82	--											
			CH_2O	0.21	--											
			NH_3	--	--											
C-3121A	C-3121A	Plant 3 Residue Compressor 1 (3616) (Annual Limits include Normal and MSS Operations)	CO	1.98	10.17	14	739,804.6	3,222,665.6	--	70.0	2.5	101.3	800	--	--	--
			NO_X	0.52	2.73											
			PM	0.35	1.53											
			SO_2	0.03	0.13											
			VOC	2.82	12.75											
			CH_2O	0.21	1.07											
			NH_3	0.84	3.68											
C-3121A	C-3121A	Plant 3 Residue Compressor 1 (3616) (Burn-In)	CO	26.10	--	14	739,804.6	3,222,665.6	--	70.0	2.5	101.3	800	--	--	--
			NO_X	5.22	--											
			PM	0.35	--											
			SO_2	0.03	--											
			VOC	9.29	--											
			CH_2O	2.71	--											
			NH_3	--	--											
C-3121A	C-3121A	Plant 3 Residue Compressor 1 (3616) (Start Up)	CO	1.98	--	14	739,804.6	3,222,665.6	--	70.0	2.5	101.3	800	--	--	--
			NO_X	2.09	--											
			PM	0.35	--											
			SO_2	0.03	--											
			VOC	2.82	--											
			CH_2O	0.21	--											
			NH_3	--	--											

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number:	TBD	RN Number:	TBD	Date:	September-11
Company Name:	ETC Texas Pipeline, Ltd. - Jackson County Gas Plant				

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AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS											
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate [a]		4. UTM Coordinates of Emission Point			5. Building Height (ft)	Source							
										6. Height Above Ground (ft)	7. Stack Exit Data			8. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (meters)	North (meters)			Diameter (ft) (A)	Velocity (fps) (B)	Tempera-ture (°F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
C-3121B	C-3121B	Plant 3 Residue Compressor 2 (3616) (Annual Limits include Normal and MSS Operations)	CO	1.98	10.17	14	739,805.3	3,222,651.8	--	70.0	2.5	101.3	800	--	--	--
			NO_X	0.52	2.73											
			PM	0.35	1.53											
			SO_2	0.03	0.13											
			VOC	2.82	12.75											
			CH_2O	0.21	1.07											
			NH_3	0.84	3.68											
C-3121B	C-3121B	Plant 3 Residue Compressor 2 (3616) (Burn-In)	CO	26.10	--	14	739,805.3	3,222,651.8	--	70.0	2.5	101.3	800	--	--	--
			NO_X	5.22	--											
			PM	0.35	--											
			SO_2	0.03	--											
			VOC	9.29	--											
			CH_2O	2.71	--											
			NH_3	--	--											
C-3121B	C-3121B	Plant 3 Residue Compressor 2 (3616) (Start Up)	CO	1.98	--	14	739,805.3	3,222,651.8	--	70.0	2.5	101.3	800	--	--	--
			NO_X	2.09	--											
			PM	0.35	--											
			SO_2	0.03	--											
			VOC	2.82	--											
			CH_2O	0.21	--											
			NH_3	--	--											
C-3121C	C-3121C	Plant 3 Residue Compressor 3 (3616) (Annual Limits include Normal and MSS Operations)	CO	1.98	10.17	14	739,805.6	3,222,637.8	--	70.0	2.5	101.3	800	--	--	--
			NO_X	0.52	2.73											
			PM	0.35	1.53											
			SO_2	0.03	0.13											
			VOC	2.82	12.75											
			CH_2O	0.21	1.07											
			NH_3	0.84	3.68											
C-3121C	C-3121C	Plant 3 Residue Compressor 3 (3616) (Burn-In)	CO	26.10	--	14	739,805.6	3,222,637.8	--	70.0	2.5	101.3	800	--	--	--
			NO_X	5.22	--											
			PM	0.35	--											
			SO_2	0.03	--											
			VOC	9.29	--											
			CH_2O	2.71	--											
			NH_3	--	--											

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number:	TBD	RN Number:	TBD	Date:	September-11
Company Name:	ETC Texas Pipeline, Ltd. - Jackson County Gas Plant				

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			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate [a]		4. UTM Coordinates of Emission Point			5. Building Height (ft)	Source							
										6. Height Above Ground (ft)	7. Stack Exit Data			8. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (meters)	North (meters)			Diameter (ft) (A)	Velocity (fps) (B)	Tempera-ture (°F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
C-3121C	C-3121C	Plant 3 Residue Compressor 3 (3616) (Start Up)	CO	1.98	--	14	739,805.6	3,222,637.8	--	70.0	2.5	101.3	800	--	--	--
			NO_X	2.09	--											
			PM	0.35	--											
			SO_2	0.03	--											
			VOC	2.82	--											
			CH_2O	0.21	--											
			NH_3	--	--											
C-4121A	C-4121A	Plant 4 Residue Compressor 1 (3616) (Annual Limits include Normal and MSS Operations)	CO	1.98	10.17	14	739,957.1	3,222,671.3	--	70.0	2.5	101.3	800	--	--	--
			NO_X	0.52	2.73											
			PM	0.35	1.53											
			SO_2	0.03	0.13											
			VOC	2.82	12.75											
			CH_2O	0.21	1.07											
			NH_3	0.84	3.68											
C-4121A	C-4121A	Plant 4 Residue Compressor 1 (3616) (Burn-In)	CO	26.10	--	14	739,957.1	3,222,671.3	--	70.0	2.5	101.3	800	--	--	--
			NO_X	5.22	--											
			PM	0.35	--											
			SO_2	0.03	--											
			VOC	9.29	--											
			CH_2O	2.71	--											
			NH_3	--	--											
C-4121A	C-4121A	Plant 4 Residue Compressor 1 (3616) (Start Up)	CO	1.98	--	14	739,957.1	3,222,671.3	--	70.0	2.5	101.3	800	--	--	--
			NO_X	2.09	--											
			PM	0.35	--											
			SO_2	0.03	--											
			VOC	2.82	--											
			CH_2O	0.21	--											
			NH_3	--	--											
C-4121B	C-4121B	Plant 4 Residue Compressor 2 (3616) (Annual Limits include Normal and MSS Operations)	CO	1.98	10.17	14	739,957.7	3,222,657.3	--	70.0	2.5	101.3	800	--	--	--
			NO_X	0.52	2.73											
			PM	0.35	1.53											
			SO_2	0.03	0.13											
			VOC	2.82	12.75											
			CH_2O	0.21	1.07											
			NH_3	0.84	3.68											

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number:	**TBD**	RN Number:	**TBD**	Date:	**September-11**
Company Name:	**ETC Texas Pipeline, Ltd. - Jackson County Gas Plant**				

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			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate [a]		4. UTM Coordinates of Emission Point			5. Building Height (ft)	Source							
										6. Height Above Ground (ft)	7. Stack Exit Data			8. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (meters)	North (meters)			Diameter (ft) (A)	Velocity (fps) (B)	Tempera-ture (°F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
C-4121B	C-4121B	Plant 4 Residue Compressor 2 (3616) (Burn-In)	CO	26.10	--	14	739,957.7	3,222,657.3	--	70.0	2.5	101.3	800	--	--	--
			NO_X	5.22	--											
			PM	0.35	--											
			SO_2	0.03	--											
			VOC	9.29	--											
			CH_2O	2.71	--											
			NH_3	--	--											
C-4121B	C-4121B	Plant 4 Residue Compressor 2 (3616) (Start Up)	CO	1.98	--	14	739,957.7	3,222,657.3	--	70.0	2.5	101.3	800	--	--	--
			NO_X	2.09	--											
			PM	0.35	--											
			SO_2	0.03	--											
			VOC	2.82	--											
			CH_2O	0.21	--											
			NH_3	--	--											
C-4121C	C-4121C	Plant 4 Residue Compressor 3 (3616) (Annual Limits include Normal and MSS Operations)	CO	1.98	10.17	14	739,958.3	3,222,643.3	--	70.0	2.5	101.3	800	--	--	--
			NO_X	0.52	2.73											
			PM	0.35	1.53											
			SO_2	0.03	0.13											
			VOC	2.82	12.75											
			CH_2O	0.21	1.07											
			NH_3	0.84	3.68											
C-4121C	C-4121C	Plant 4 Residue Compressor 3 (3616) (Burn-In)	CO	26.10	--	14	739,958.3	3,222,643.3	--	70.0	2.5	101.3	800	--	--	--
			NO_X	5.22	--											
			PM	0.35	--											
			SO_2	0.03	--											
			VOC	9.29	--											
			CH_2O	2.71	--											
			NH_3	--	--											
C-4121C	C-4121C	Plant 4 Residue Compressor 3 (3616) (Start Up)	CO	1.98	--	14	739,958.3	3,222,643.3	--	70.0	2.5	101.3	800	--	--	--
			NO_X	2.09	--											
			PM	0.35	--											
			SO_2	0.03	--											
			VOC	2.82	--											
			CH_2O	0.21	--											
			NH_3	--	--											

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number:	TBD	RN Number:	TBD	Date:	September-11
Company Name:	ETC Texas Pipeline, Ltd. - Jackson County Gas Plant				

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			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate [a]		4. UTM Coordinates of Emission Point			5. Building Height (ft)	Source 6. Height Above Ground (ft)	7. Stack Exit Data			8. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (meters)	North (meters)			Diameter (ft) (A)	Velocity (fps) (B)	Tempera-ture (°F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
H-1706	H-1706	Plant 1 Hot Oil Heater 1	CO	3.97	17.39	14	739,493.8	3,222,815.1	--	50.0	3	77.1	775	--	--	--
			NO_X	1.74	7.62											
			PM	0.36	1.58											
			SO_2	0.03	0.13											
			VOC	0.26	1.14											
			CH_2O	0.004	0.02											
H-7810	H-7810	Plant 1 Hot Oil Heater 2	CO	1.43	6.26	14	739,450.8	3,222,804.0	--	17.8	3	18.5	850	--	--	--
			NO_X	0.63	2.76											
			PM	0.13	0.57											
			SO_2	0.01	0.04											
			VOC	0.09	0.39											
			CH_2O	0.001	0.004											
H-7410	H-7410	Plant 1 TEG Dehy Unit Regen Gas Heater	CO	0.25	1.10	14	739,463.5	3,222,632.7	--	20.0	1	27.6	800	--	--	--
			NO_X	0.11	0.48											
			PM	0.02	0.09											
			SO_2	0.002	0.01											
			VOC	0.02	0.09											
			CH_2O	0.0002	0.001											
TO-1	TO-1, F-1117, F-1527	Plant 1 Thermal Oxidizer (Amine Unit and Dehy Vents)	CO	0.79	3.46	14	739,499.0	3,222,591.4	--	75.0	3	150.4	1400	--	--	--
			NO_X	0.47	2.06											
			PM	0.07	0.31											
			SO_2	1.51	6.61											
			VOC	0.59	2.60											
			CH_2O	0.001	0.00											
			H_2S	0.02	0.07											
H-2706	H-2706	Plant 2 Hot Oil Heater 1	CO	3.97	17.39	14	739,640.1	3,222,820.9	--	50.0	3	77.1	775	--	--	--
			NO_X	1.74	7.62											
			PM	0.36	1.58											
			SO_2	0.030	0.13											
			VOC	0.26	1.14											
			CH_2O	0.0040	0.020											
H-7811	H-7811	Plant 2 Hot Oil Heater 2	CO	1.43	6.26	14	739,596.7	3,222,810.0	--	17.8	3	18.5	850	--	--	--
			NO_X	0.63	2.76											
			PM	0.13	0.57											
			SO_2	0.01	0.04											
			VOC	0.09	0.39											
			CH_2O	0.001	0.0040											

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number:	TBD	RN Number:	TBD	Date:	September-11
Company Name:	ETC Texas Pipeline, Ltd. - Jackson County Gas Plant				

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			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate [a]		4. UTM Coordinates of Emission Point			5. Building Height (ft)	Source							
										6. Height Above Ground (ft)	7. Stack Exit Data			8. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (meters)	North (meters)			Diameter (ft) (A)	Velocity (fps) (B)	Tempera-ture (°F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
H-7411	H-7411	Plant 2 TEG Dehy Unit Regen Gas Heater	CO	0.25	1.10	14	739,609.7	3,222,638.7	--	20.0	1	27.6	800	--	--	--
			NO_X	0.11	0.48											
			PM	0.02	0.09											
			SO_2	0.002	0.01											
			VOC	0.02	0.09											
			CH_2O	0.0002	0.001											
TO-2	TO-2, F-2117, F-2527	Plant 2 Thermal Oxidizer (Amine Unit and Dehy Vents)	CO	0.79	3.46	14	739,645.2	3,222,597.4	--	75.0	3	150.4	1400	--	--	--
			NO_X	0.47	2.06											
			PM	0.07	0.31											
			SO_2	1.51	6.61											
			VOC	0.59	2.60											
			CH_2O	0.001	0.00											
			H_2S	0.02	0.07											
H-3706	H-3706	Plant 3 Hot Oil Heater 1	CO	3.97	17.39	14	739,792.2	3,222,827.2	--	50.0	3	77.1	775	--	--	--
			NO_X	1.74	7.62											
			PM	0.36	1.58											
			SO_2	0.03	0.13											
			VOC	0.26	1.14											
			CH_2O	0.004	0.020											
H-7812	H-7812	Plant 3 Hot Oil Heater 2	CO	1.43	6.26	14	739,749.3	3,222,815.8	--	17.8	3	18.5	850	--	--	--
			NO_X	0.63	2.76											
			PM	0.13	0.57											
			SO_2	0.01	0.04											
			VOC	0.09	0.39											
			CH_2O	0.001	0.004											
H-7412	H-7412	Plant 3 TEG Dehy Unit Regen Gas Heater	CO	0.25	1.10	14	739,762.1	3,222,644.9	--	20.0	1	27.6	800	--	--	--
			NO_X	0.11	0.48											
			PM	0.02	0.09											
			SO_2	0.002	0.01											
			VOC	0.02	0.09											
			CH_2O	0.0002	0.001											
TO-3	TO-3, F-3117, F-3527	Plant 3 Thermal Oxidizer (Amine Unit and Dehy Vents)	CO	0.79	3.46	14	739,797.4	3,222,603.7	--	75.0	3	150.4	1400	--	--	--
			NO_X	0.47	2.06											
			PM	0.07	0.31											
			SO_2	1.51	6.61											
			VOC	0.59	2.60											
			CH_2O	0.001	0.00											
			H_2S	0.02	0.07											

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number:	**TBD**	RN Number:	**TBD**	Date:	**September-11**
Company Name:	**ETC Texas Pipeline, Ltd. - Jackson County Gas Plant**				

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			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate [a]		4. UTM Coordinates of Emission Point			5. Building Height (ft)	Source							
										6. Height Above Ground (ft)	7. Stack Exit Data			8. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (meters)	North (meters)			Diameter (ft) (A)	Velocity (fps) (B)	Tempera-ture (°F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
H-4706	H-4706	Plant 4 Hot Oil Heater 1	CO	3.97	17.39	14	739,945.0	3,222,832.6	--	50.0	3	77.1	775	--	--	--
			NO_X	1.74	7.62											
			PM	0.36	1.58											
			SO_2	0.03	0.13											
			VOC	0.26	1.14											
			CH_2O	0.004	0.020											
H-7813	H-7813	Plant 4 Hot Oil Heater 2	CO	1.43	6.26	14	739,901.5	3,222,821.7	--	17.8	3	18.5	850	--	--	--
			NO_X	0.63	2.76											
			PM	0.13	0.57											
			SO_2	0.01	0.04											
			VOC	0.09	0.39											
			CH_2O	0.001	0.004											
H-7413	H-7413	Plant 4 TEG Dehy Unit Regen Gas Heater	CO	0.25	1.10	14	739,914.2	3,222,650.4	--	20.0	1	27.6	800	--	--	--
			NO_X	0.11	0.48											
			PM	0.02	0.09											
			SO_2	0.002	0.01											
			VOC	0.02	0.09											
			CH_2O	0.0002	0.001											
TO-4	TO-4, F-4117, F-4527	Plant 4 Thermal Oxidizer (Amine Unit and Dehy Vents)	CO	0.79	3.46	14	739,949.8	3,222,609.5	--	75.0	3	150.4	1400	--	--	--
			NO_X	0.47	2.06											
			PM	0.07	0.31											
			SO_2	1.51	6.61											
			VOC	0.59	2.60											
			CH_2O	0.001	0.00											
			H_2S	0.02	0.07											
P1-FUG	P1-FUG	Plant 1 Fugitives	VOC	1.74	7.60	14	739,473.3	3,222,707.3	--	--	--	--	--	800	300	178
			H_2S	0.0001	0.0003											
P2-FUG	P2-FUG	Plant 2 Fugitives	VOC	1.74	7.60	14	739,625.3	3,222,714.0	--	--	--	--	--	800	300	178
			H_2S	0.0001	0.0003											
P3-FUG	P3-FUG	Plant 3 Fugitives	VOC	1.74	7.60	14	739,777.6	3,222,719.9	--	--	--	--	--	800	300	178
			H_2S	0.0001	0.0003											
P4-FUG	P4-FUG	Plant 4 Fugitives	VOC	1.74	7.60	14	739,928.3	3,222,725.6	--	--	--	--	--	800	300	178
			H_2S	0.0001	0.0003											
P1-TK-AMINE	P1-TK-AMINE	Plant 1 Amine Tank	VOC	0.12	0.001	14	739,465.6	3,222,602.5	--	15.0	10	0.01	68	--	--	--
P1-TK-GLY	P1-TK-GLY	Plant 1 Glycol Tank	VOC	0.02	0.0002	14	739,472.4	3,222,622.9	--	15.0	10	0.01	68	--	--	--

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number:	**TBD**	RN Number:	**TBD**	Date:	**September-11**
Company Name:	**ETC Texas Pipeline, Ltd. - Jackson County Gas Plant**				

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			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate [a]		4. UTM Coordinates of Emission Point			5. Building Height (ft)	Source 6. Height Above Ground (ft)	7. Stack Exit Data			8. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (meters)	North (meters)			Diameter (ft) (A)	Velocity (fps) (B)	Tempera-ture (°F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
P1-TK-SO	P1-TK-SO	Plant 1 Slop Oil Tank	VOC	25.02	0.19	14	739,503.4	3,222,615.3	--	15.0	10	0.01	68	--	--	--
P1-TK-LO	P1-TK-LO	Plant 1 Lube Oil Tank	VOC	0.004	0.00004	14	739,506.7	3,222,617.6	--	15.0	10	0.01	68	--	--	--
P1-TK-WO	P1-TK-WO	Plant 1 Waste Oil Tank	VOC	0.004	0.00004	14	739,506.7	3,222,617.6	--	15.0	10	0.01	68	--	--	--
P2-TK-AMINE	P2-TK-AMINE	Plant 2 Amine Tank	VOC	0.12	0.001	14	739,611.8	3,222,608.5	--	15.0	10	0.01	68	--	--	--
P2-TK-GLY	P2-TK-GLY	Plant 2 Glycol Tank	VOC	0.02	0.0002	14	739,618.5	3,222,628.9	--	15.0	10	0.01	68	--	--	--
P2-TK-SO	P2-TK-SO	Plant 2 Slop Oil Tank	VOC	25.02	0.19	14	739,649.6	3,222,621.4	--	15.0	10	0.01	68	--	--	--
P2-TK-LO	P2-TK-LO	Plant 2 Lube Oil Tank	VOC	0.004	0.00004	14	739,652.9	3,222,623.6	--	15.0	10	0.01	68	--	--	--
P2-TK-WO	P2-TK-WO	Plant 2 Waste Oil Tank	VOC	0.004	0.00004	14	739,652.9	3,222,623.6	--	15.0	10	0.01	68	--	--	--
P3-TK-AMINE	P3-TK-AMINE	Plant 3 Amine Tank	VOC	0.12	0.001	14	739,764.1	3,222,614.8	--	15.0	10	0.01	68	--	--	--
P3-TK-GLY	P3-TK-GLY	Plant 3 Glycol Tank	VOC	0.02	0.0002	14	739,770.8	3,222,635.2	--	15.0	10	0.01	68	--	--	--
P3-TK-SO	P3-TK-SO	Plant 3 Slop Oil Tank	VOC	25.02	0.19	14	739,801.8	3,222,627.6	--	15.0	10	0.01	68	--	--	--
P3-TK-LO	P3-TK-LO	Plant 3 Lube Oil Tank	VOC	0.004	0.00004	14	739,805.2	3,222,629.9	--	15.0	10	0.01	68	--	--	--
P3-TK-WO	P3-TK-WO	Plant 3 Waste Oil Tank	VOC	0.004	0.00004	14	739,805.2	3,222,629.9	--	15.0	10	0.01	68	--	--	--
P4-TK-AMINE	P4-TK-AMINE	Plant 4 Amine Tank	VOC	0.12	0.001	14	739,919.5	3,222,620.3	--	15.0	10	0.01	68	--	--	--
P4-TK-GLY	P4-TK-GLY	Plant 4 Glycol Tank	VOC	0.02	0.0002	14	739,925.3	3,222,640.6	--	15.0	10	0.01	68	--	--	--
P4-TK-SO	P4-TK-SO	Plant 4 Slop Oil Tank	VOC	25.02	0.19	14	739,954.2	3,222,633.4	--	15.0	10	0.01	68	--	--	--
P4-TK-LO	P4-TK-LO	Plant 4 Lube Oil Tank	VOC	0.004	0.00004	14	739,957.5	3,222,635.7	--	15.0	10	0.01	68	--	--	--
P4-TK-WO	P4-TK-WO	Plant 4 Waste Oil Tank	VOC	0.004	0.00004	14	739,957.5	3,222,635.7	--	15.0	10	0.01	68	--	--	--
TK-3	TK-3	Produced Water Tank	VOC	1.12	0.01	14	739,200.8	3,222,572.3	--	15.0	12	0.01	68	--	--	--
TK-4	TK-4	Produced Water Tank	VOC	1.12	0.01	14	739,204.7	3,222,572.5	--	15.0	12	0.01	68	--	--	--
P-617-621	PW-LOAD	Loading Rack (Produced Water Loading)	VOC	0.04	0.001	14	739,177.4	3,222,547.0	--	--	--	--	--	--	--	--
FS-800	FS-800, GRP-BDSV	Plant Flare	CO NO_X PM SO_2 VOC H_2S	77.58 9.05 -- 0.90 303.22 0.00	10.62 1.25 -- 0.04 2.60 0.0004	14	739,282.4	3,222,790.0	--	50.0	9.09	65.6	1832	--	--	--

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number:	TBD	RN Number:	TBD	Date:	September-11
Company Name:	ETC Texas Pipeline, Ltd. - Jackson County Gas Plant				

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			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate [a]		4. UTM Coordinates of Emission Point			5. Building Height (ft)	Source							
										6. Height Above Ground (ft)	7. Stack Exit Data			8. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (meters)	North (meters)			Diameter (ft) (A)	Velocity (fps) (B)	Tempera-ture (°F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
Existing, Unmodified PBR Sources																
STAB-FUG	STAB-FUG	Stabilization Unit Fugitives	VOC H_2S	0.22 9.77E-06	0.95 4.28E-05	14	739,341.7	3,222,503.8	--	--	--	--	--	400	115	88
TK-1	TK-1	Stabilized Condensate Tank	VOC	1.53	3.96	14	739,192.5	3,222,572.0	--	18.0	20	0.01	68	--	--	--
TK-2	TK-2	Stabilized Condensate Tank	VOC	1.53	3.96	14	739,196.5	3,222,572.1	--	18.0	20	0.01	68	--	--	--
H-741	H-741	Stabilization Unit Heater	CO NO_X PM SO_2 VOC CH_2O	0.48 0.21 0.04 0.004 0.03 0.0004	2.10 0.92 0.18 0.02 0.13 0.002	14	739,344.8	3,222,549.5	--	16.5	2.5	8.9	850	--	--	--
TL-Flare	TL-Flare, C-LOAD	Truck Loading Flare (Controlled Condensate Loading)	CO NO_X PM SO_2 VOC H_2S	0.27 0.03 -- 0.0003 1.88 --	0.44 0.06 -- 0.0005 1.60 --	14	739,252.0	3,222,788.7	--	50.0	0.44	65.6	1832	--	--	--
P-617-621	C-LOAD and P-617-621	Loading Rack (Uncaptured Condensate Loading and Pressurized Truck Unloading)	VOC	6.54	3.47	14	739,177.4	3,222,547.0	--	--	--	--	--	--	--	--

[a] All emission rates are estimated values only and should not be considered maximum allowable emission rates.

TABLE 6-2

PROJECT STACK PARAMETERS

ETC TEXAS PIPELINE, LTD., JACKSON COUNTY PLANT

AERMOD Source ID[a]	Emission Point Identification[b]	Zone 14 (NAD83) UTM Coordinates[c] Easting (m)	Northing (m)	Base Elevation[d] (msl) (ft)	(m)	Stack Parameters: Stack Height (ft)	(m)	Stack Exit Temperature (°F)	(K)	Stack Exit Velocity (ft/sec)	(m/sec)	Stack Diameter (ft)	(m)
C1100A	Plant 1 Inlet Compressor 1 (3606) **(EPN-C-1100A)**	739,334	3,222,695	83.76	25.53	50.00	15.24	800.01	699.8	62.12	18.93	2.00	0.61
C1100B	Plant 1 Inlet Compressor 2 (3606) **(EPN-C-1100B)**	739,348	3,222,695	83.73	25.52	50.00	15.24	800.01	699.8	62.12	18.93	2.00	0.61
C1121A	Plant 1 Residue Compressor 1 (3616) **(EPN-C-1121A)**	739,506	3,222,654	83.46	25.44	70.00	21.34	800.01	699.8	101.33	30.89	2.50	0.76
C1121B	Plant 1 Residue Compressor 2 (3616) **(EPN-C-1121B)**	739,507	3,222,639	83.43	25.43	70.00	21.34	800.01	699.8	101.33	30.89	2.50	0.76
C1121C	Plant 1 Residue Compressor 3 (3616) **(EPN-C-1121C)**	739,507	3,222,626	83.40	25.42	70.00	21.34	800.01	699.8	101.33	30.89	2.50	0.76
C2100A	Plant 2 Inlet Compressor 1 (3606) **(EPN-C-C-2100A)**	739,365	3,222,696	83.69	25.51	50.00	15.24	800.01	699.8	62.12	18.93	2.00	0.61
C2100B	Plant 2 Inlet Compressor 2 (3606) **(EPN-C-2100B)**	739,379	3,222,697	83.69	25.51	50.00	15.24	800.01	699.8	62.12	18.93	2.00	0.61
C2121A	Plant 2 Residue Compressor 1 (3616) **(EPN-C-2121A)**	739,652	3,222,660	83.27	25.38	70.00	21.34	800.01	699.8	101.33	30.89	2.50	0.76
C2121B	Plant 2 Residue Compressor 2 (3616) **(EPN-C-2121B)**	739,653	3,222,646	83.27	25.38	70.00	21.34	800.01	699.8	101.33	30.89	2.50	0.76
C2121C	Plant 2 Residue Compressor 3 (3616) **(EPN-C-2121C)**	739,653	3,222,632	83.23	25.37	70.00	21.34	800.01	699.8	101.33	30.89	2.50	0.76
C3100A	Plant 3 Inlet Compressor 1 (3606) **(EPN-C-3100A)**	739,336	3,222,631	83.66	25.50	50.00	15.24	800.01	699.8	62.12	18.93	2.00	0.61
C3100B	Plant 3 Inlet Compressor 2 (3606) **(EPN-C-3100B)**	739,352	3,222,632	83.63	25.49	50.00	15.24	800.01	699.8	62.10	18.93	2.00	0.61
C3121A	Plant 3 Residue Compressor 1 (3616) **(EPN-C-C-3121A)**	739,805	3,222,666	83.04	25.31	70.00	21.34	800.01	699.8	101.33	30.89	2.50	0.76
C3121B	Plant 3 Residue Compressor 2 (3616) **(EPN-C-3121B)**	739,805	3,222,652	83.04	25.31	70.00	21.34	800.01	699.8	101.33	30.89	2.50	0.76
C3121C	Plant 3 Residue Compressor 3 (3616) **(EPN-C-3121C)**	739,806	3,222,638	83.01	25.30	70.00	21.34	800.01	699.8	101.33	30.89	2.50	0.76

TABLE 6-2

PROJECT STACK PARAMETERS

ETC TEXAS PIPELINE, LTD., JACKSON COUNTY PLANT

AERMOD Source ID[a]	Emission Point Identification[b]	Zone 14 (NAD83) UTM Coordinates[c] Easting (m)	Northing (m)	Base Elevation[d] (msl) (ft)	(m)	Stack Parameters: Stack Height (ft)	(m)	Stack Exit Temperature (°F)	(K)	Stack Exit Velocity (ft/sec)	(m/sec)	Stack Diameter (ft)	(m)
C4100A	Plant 4 Inlet Compressor 1 (3606) **(EPN-C-4100A)**	739,367	3,222,632	83.60	25.48	50.00	15.24	800.01	699.8	62.12	18.93	2.00	0.61
C4100B	Plant 4 Inlet Compressor 2 (3606) **(EPN-C-4100B)**	739,382	3,222,633	83.60	25.48	50.00	15.24	800.01	699.8	62.10	18.93	2.00	0.61
C4121A	Plant 4 Residue Compressor 1 (3616) **(EPN-C-4121A)**	739,957	3,222,671	82.74	25.22	70.00	21.34	800.01	699.8	101.33	30.89	2.50	0.76
C4121B	Plant 4 Residue Compressor 2 (3616) **(EPN-C-4121B)**	739,958	3,222,657	82.74	25.22	70.00	21.34	800.01	699.8	101.33	30.89	2.50	0.76
C4121C	Plant 4 Residue Compressor 3 (3616) **(EPN-C-4121C)**	739,958	3,222,643	82.71	25.21	70.00	21.34	800.01	699.8	101.33	30.89	2.50	0.76
H1706	Plant 1 Hot Oil Heater 1 **(EPN-H-1706)**	739,494	3,222,815	83.73	25.52	50.00	15.24	775.00	685.93	77.12	23.51	3.00	0.91
H7810	Plant 1 Hot Oil Heater 2 **(EPN-H-7810)**	739,451	3,222,804	83.79	25.54	17.82	5.43	849.99	727.59	18.50	5.64	3.00	0.91
H7410	Plant 1 TEG Dehy Unit Regen Gas Heater **(EPN-H-7410)**	739,464	3,222,633	83.46	25.44	20.00	6.10	800.01	699.82	27.60	8.41	1.00	0.30
TO1	Plant 1 Thermal Oxidizer (TO-1) **(EPN-TO-1)**	739,499	3,222,591	83.37	25.41	75.00	22.86	1,400.00	1033.15	150.37	45.83	3.00	0.91
H2706	Plant 2 Hot Oil Heater 1 **(EPN-H-2706)**	739,640	3,222,821	83.56	25.47	50.00	15.24	775.00	685.93	77.12	23.51	3.00	0.91
H7811	Plant 2 Hot Oil Heater 2 **(EPN-H-7811)**	739,597	3,222,810	83.60	25.48	17.80	5.43	849.99	727.59	18.50	5.64	3.00	0.91
H7411	Plant 2 TEG Dehy Unit Regen Gas Heater **(EPN-H-7411)**	739,610	3,222,639	83.30	25.39	20.00	6.10	800.01	699.82	27.60	8.41	1.00	0.30
TO2	Plant 2 Thermal Oxidizer (TO-2) **(EPN-TO-2)**	739,645	3,222,597	83.17	25.35	75.00	22.86	1,400.00	1033.15	150.37	45.83	3.00	0.91
H3706	Plant 3 Hot Oil Heater 1 **(EPN-H-3706)**	739,792	3,222,827	83.37	25.41	50.00	15.24	775.00	685.93	77.12	23.51	3.00	0.91
H7812	Plant 3 Hot Oil Heater 2 **(EPN:H-7812)**	739,749	3,222,816	83.40	25.42	17.80	5.43	849.99	727.59	18.50	5.64	3.00	0.91

TABLE 6-2

PROJECT STACK PARAMETERS

ETC TEXAS PIPELINE, LTD., JACKSON COUNTY PLANT

AERMOD Source ID[a]	Emission Point Identification[b]	Zone 14 (NAD83) UTM Coordinates[c] Easting (m)	Northing (m)	Base Elevation[d] (msl) (ft)	(m)	Stack Parameters: Stack Height (ft)	(m)	Stack Exit Temperature (°F)	(K)	Stack Exit Velocity (ft/sec)	(m/sec)	Stack Diameter (ft)	(m)
H7412	Plant 3 TEG Dehy Unit Regen Gas Heater **(EPN-H-7412)**	739,762	3,222,645	83.10	25.33	20.00	6.10	800.01	699.82	27.60	8.41	1.00	0.30
TO3	Plant 3 Thermal Oxidizer (TO-3) **(EPN-TO-3)**	739,797	3,222,604	82.97	25.29	75.00	22.86	1,400.00	1033.15	150.37	45.83	3.00	0.91
H4706	Plant 4 Hot Oil Heater 1 **(EPN-H-4706)**	739,945	3,222,833	83.23	25.37	50.00	15.24	775.00	685.93	77.12	23.51	3.00	0.91
H7813	Plant 4 Hot Oil Heater 2 **(EPN-H-7813)**	739,902	3,222,822	83.27	25.38	17.80	5.43	849.99	727.59	18.50	5.64	3.00	0.91
H7413	Plant 4 TEG Dehy Unit Regen Gas Heater **(EPN-H-7413)**	739,914	3,222,650	82.84	25.25	20.00	6.10	800.01	699.82	27.60	8.41	1.00	0.30
TO4	Plant 4 Thermal Oxidizer (TO-4) **(EPN-TO-4)**	739,950	3,222,610	82.68	25.20	75.00	22.86	1,400.00	1033.15	150.37	45.83	3.00	0.91
H741	H-741 Stabilization Unit Heater **(EPN-H-741)**	739,345	3,222,550	83.50	25.45	16.50	5.03	849.99	727.59	8.90	2.71	2.50	0.76
FS800	Flare **(EPN-FS-800)**	739,282	3,222,790	83.99	25.60	50.00	15.24	1,832.00	1273.15	65.62	20.00	18.21	5.55
TLFLARE	TL-FLARE **(EPN-TL-Flare)**	739,252	3,222,789	84.02	25.61	50.00	15.24	1,832.00	1273.15	65.62	20.00	0.44	0.13

[a] The AERMOD Source ID is the unique source identification used in the AERMOD model input files. The Project sources have the EPN nomenclature listed in the Table 1(a) of the permit application.

[b] The "Emission Point Description" in this table is also entered in the AERMOD source file and describes the EPN.

[c] The UTM coordinates are in the NAD83, UTM Zone 14, system.

[d] The elevation is above mean sea level (msl) and was determined using the BEE-Line algorithm contained in the AERMAP package to calculate the terrain heights using the elevations contained in the National Elevation Data (NED) file for the location as input.

TABLE 6-3

PROJECT CRITERIA AIR POLLUTANT EMISSION RATES MODELED

ETC TEXAS PIPELINE, LTD., JACKSON COUNTY PLANT

AERMOD Source ID[a]	Emission Point Identification[b]	NO_X	$PM_{10}/PM_{2.5}$	SO_2
C1100A	Plant 1 Inlet Compressor 1 (3606) **(EPN-C-1100A)**	1.96	0.13	0.01
C1100B	Plant 1 Inlet Compressor 2 (3606) **(EPN-C-1100B)**	1.96	0.13	0.01
C1121A	Plant 1 Residue Compressor 1 (3616) **(EPN-C-1121A)**	0.73	0.35	0.03
C1121B	Plant 1 Residue Compressor 2 (3616) **(EPN-C-1121B)**	0.73	0.35	0.03
C1121C	Plant 1 Residue Compressor 3 (3616) **(EPN-C-1121C)**	0.73	0.35	0.03
C2100A	Plant 2 Inlet Compressor 1 (3606) **(EPN-C-C-2100A)**	1.96	0.13	0.01
C2100B	Plant 2 Inlet Compressor 2 (3606) **(EPN-C-2100B)**	1.96	0.13	0.01
C2121A	Plant 2 Residue Compressor 1 (3616) **(EPN-C-2121A)**	0.73	0.35	0.03
C2121B	Plant 2 Residue Compressor 2 (3616) **(EPN-C-2121B)**	0.73	0.35	0.03
C2121C	Plant 2 Residue Compressor 3 (3616) **(EPN-C-2121C)**	0.73	0.35	0.03
C3100A	Plant 3 Inlet Compressor 1 (3606) **(EPN-C-3100A)**	1.96	0.13	0.01
C3100B	Plant 3 Inlet Compressor 2 (3606) **(EPN-C-3100B)**	1.96	0.13	0.01
C3121A	Plant 3 Residue Compressor 1 (3616) **(EPN-C-C-3121A)**	0.73	0.35	0.03
C3121B	Plant 3 Residue Compressor 2 (3616) **(EPN-C-3121B)**	0.73	0.35	0.03
C3121C	Plant 3 Residue Compressor 3 (3616) **(EPN-C-3121C)**	0.73	0.35	0.03
C4100A	Plant 4 Inlet Compressor 1 (3606) **(EPN-C-4100A)**	1.96	0.13	0.01
C4100B	Plant 4 Inlet Compressor 2 (3606) **(EPN-C-4100B)**	1.96	0.13	0.01
C4121A	Plant 4 Residue Compressor 1 (3616) **(EPN-C-4121A)**	0.73	0.35	0.03
C4121B	Plant 4 Residue Compressor 2 (3616) **(EPN-C-4121B)**	0.73	0.35	0.03
C4121C	Plant 4 Residue Compressor 3 (3616) **(EPN-C-4121C)**	0.73	0.35	0.03

TABLE 6-3

PROJECT CRITERIA AIR POLLUTANT EMISSION RATES MODELED

ETC TEXAS PIPELINE, LTD., JACKSON COUNTY PLANT

AERMOD Source ID[a]	Emission Point Identification[b]	NO_X	$PM_{10}/PM_{2.5}$	SO_2
H1706	Plant 1 Hot Oil Heater 1 **(EPN-H-1706)**	1.73	0.36	0.03
H7810	Plant 1 Hot Oil Heater 2 **(EPN-H-7810)**	0.63	0.13	0.01
H7410	Plant 1 TEG Dehy Unit Regen Gas Heater **(EPN-H-7410)**	0.11	0.02	0.002
TO1	Plant 1 Thermal Oxidizer (TO-1) **(EPN-TO-1)**	0.44	0.07	1.51
H2706	Plant 2 Hot Oil Heater 1 **(EPN-H-2706)**	1.73	0.36	0.03
H7811	Plant 2 Hot Oil Heater 2 **(EPN-H-7811)**	0.63	0.13	0.01
H7411	Plant 2 TEG Dehy Unit Regen Gas Heater **(EPN-H-7411)**	0.11	0.02	0.002
TO2	Plant 2 Thermal Oxidizer (TO-2) **(EPN-TO-2)**	0.44	0.07	1.51
H3706	Plant 3 Hot Oil Heater 1 **(EPN-H-3706)**	1.73	0.36	0.03
H7812	Plant 3 Hot Oil Heater 2 **(EPN:H-7812)**	0.63	0.13	0.01
H7412	Plant 3 TEG Dehy Unit Regen Gas Heater **(EPN-H-7412)**	0.11	0.02	0.002
TO3	Plant 3 Thermal Oxidizer (TO-3) **(EPN-TO-3)**	0.44	0.07	1.51
H4706	Plant 4 Hot Oil Heater 1 **(EPN-H-4706)**	1.73	0.36	0.03
H7813	Plant 4 Hot Oil Heater 2 **(EPN-H-7813)**	0.63	0.13	0.01
H7413	Plant 4 TEG Dehy Unit Regen Gas Heater **(EPN-H-7413)**	0.11	0.02	0.002
TO4	Plant 4 Thermal Oxidizer (TO-4) **(EPN-TO-4)**	0.44	0.07	1.51
H741	H-741 Stabilization Unit Heater **(EPN-H-741)**	0.21	0.04	0.004
FS800	Flare **(EPN-FS-800)**	36.18	-	0.90
TLFLARE	TL-FLARE **(EPN-TL-Flare)**	0.03	-	0.0003

[a] The AERMOD Source ID is the unique source identification used in the AERMOD model input files. The Project sources have the EPN nomenclature listed in the Table 1(a) of the permit application.

TABLE 6-3

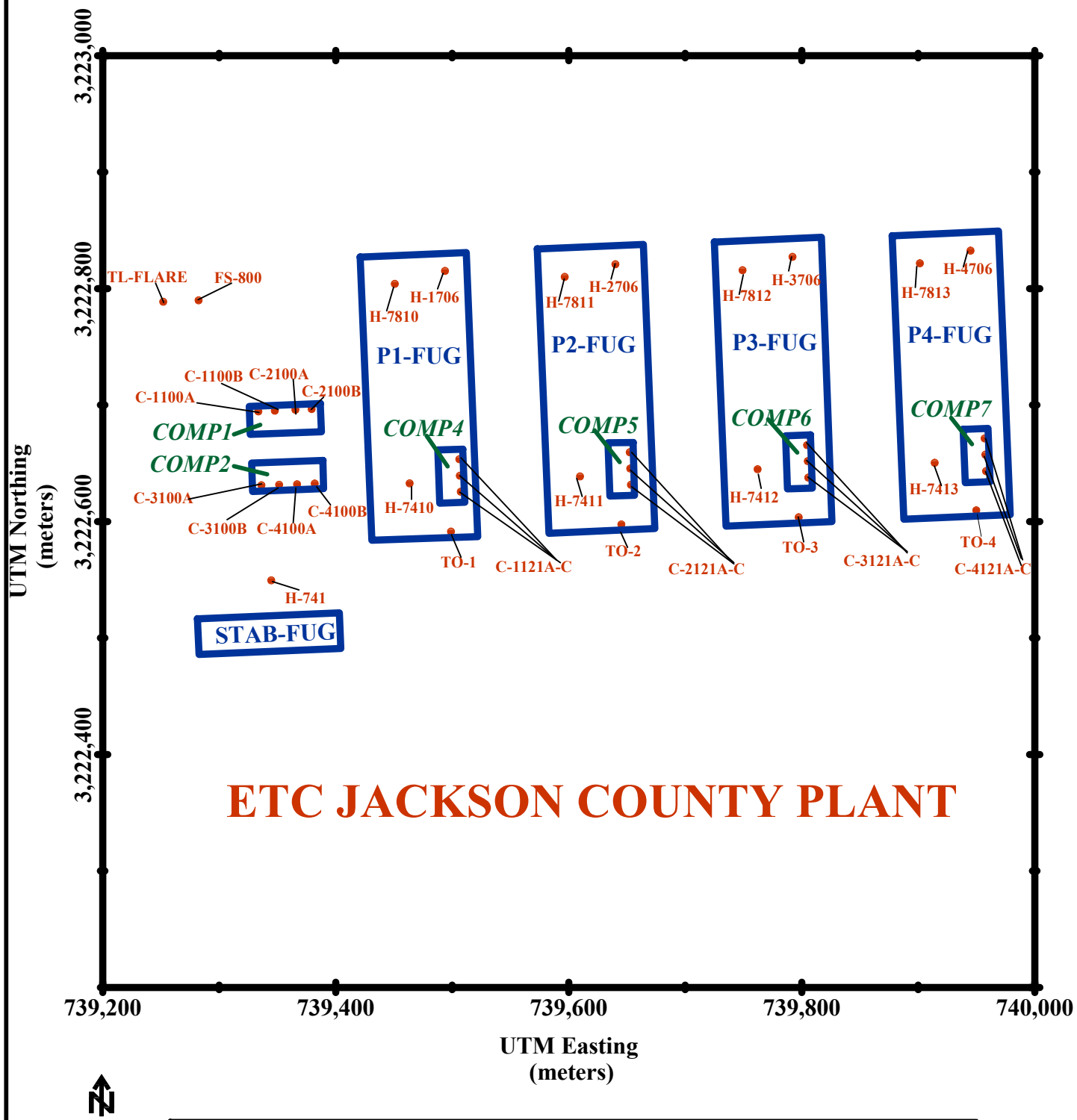
PROJECT CRITERIA AIR POLLUTANT EMISSION RATES MODELED

ETC TEXAS PIPELINE, LTD., JACKSON COUNTY PLANT

AERMOD Source ID[a]	Emission Point Identification[b]	NO_X	$PM_{10}/PM_{2.5}$	SO_2

[b] The "Emission Point Description" in this table is also entered in the AERMOD source file.

[c] Project short-term emission rates are listed for the modeled criteria air pollutants having a secondary NAAQS.



Downwash structures (compressor buildings) are labeled in green.

Red dots are ETC Jackson County Plant criteria air pollutant point sources.

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FIGURE 6-1
Plant Criteria Air Pollutant Point Sources, Fugitive Areas, and Structures
November 2011

7. MODELS AND MODELING TECHNIQUES

Section 7 provides a discussion of the dispersion model, the model version number, and the primary model entry data options that have been used in the AQA. Section 7 also includes a discussion of the modeling methodology that has been used to demonstrate compliance with federal and State air standards.

7.1 Models and Model Entry Data Options

The AERMOD model, dated 11103 (i.e., Julian Day 103 of 2011) was the dispersion model used to conduct this analysis. The AERMOD model is contained in a software package that was purchased from BEE-Line Software.

The regulatory default model options were engaged in AERMOD, as recommended by the TCEQ and as described in the EPA's Guideline on Air Quality Models. Therefore, the AERMOD model used final plume rise for determining concentrations at all receptors, considered stack-tip downwash, used buoyancy-induced dispersion to account for dispersion caused by turbulence in the plume, and used a calm wind processing routine for hours during which the wind speed was below 1 meter per second. Enabling these options ensured a conservative assessment of impacts.

Other aspects of the modeling methodology, which were applied in accordance with TCEQ AQMG guidance, are:

- Land use within 3 kilometers of the Project is overwhelmingly "rural." Therefore, as discussed in Section 8, AERMOD was executed in the rural mode.
- As discussed in Section 9, building wake effects on each Project emission point were incorporated into AERMOD through the use of the BPIP algorithm (i.e., BPIP Version 04274), which is a part of the BEE-Line (i.e., "BEEST") software package. The BPIP algorithm generates directionally-dependent vertical and horizontal structure dimensions for each emission point, for each 10-degree directional segment. The structure dimensions are then imported into AERMOD on an emission-point specific basis.
- Terrain elevations were determined for all emission sources, aerodynamic downwash structures, and receptors using the AERMAP algorithm contained within AERMOD (Section 10).
- As discussed in Section 12, the VCT hourly sequential meteorological data sets for 1983, and 1984, 1986, 1987, and 1988 were inputs for the AERMOD modeling analyses. "VCT" is the 3-letter station identifier for the Victoria, Texas surface observation station and upper air station. The data sets were downloaded from the TCEQ Internet web site. A concatenated five-year (i.e., 1983, 1984 and 1986 through 1988) meteorological data set was used for the

NO_2 and $PM_{2.5}$ analysis The five individual data-years were used for the PM_{10} analysis, and the 1988 data set was used for the SO_2 analysis.

AERMOD was used to predict both short-term and long-term (i.e., annual) impacts.

7.2 General Modeling Approach and Assumptions

The modeling techniques used for all aspects of the AQA were in accordance with the TCEQ's written guidance.

7.2.1 Preliminary Impact Determinations

The Project sources were modeled to determine the maximum predicted concentrations, to determine whether the Project had impacts above the respective SILs andto determine the ROIs on an individual air pollutant and averaging period basis if the Project impacts for a pollutant were above the applicable SIL(s).

8. SELECTION OF DISPERSION COEFFICIENT OPTION

AERMOD is executed using dispersion coefficients that are based upon the predominant land use in the area within which the Project emissions will disperse. An Auer Land Use Analysis, which classifies all regions within three kilometers of the facility using rural and urban land use classification criteria, is usually used to quantify the percentages of the region having urban and rural land usage and to thereby determine whether the rural or urban dispersion mode is appropriate for the modeling analysis. The dispersion mode selected for modeling a region affects the rate at which the AERMOD model allows wind speed to increase with height and determines the horizontal and vertical plume dispersion and hourly mixing-height formulations which AERMOD uses for computing downwind concentrations.

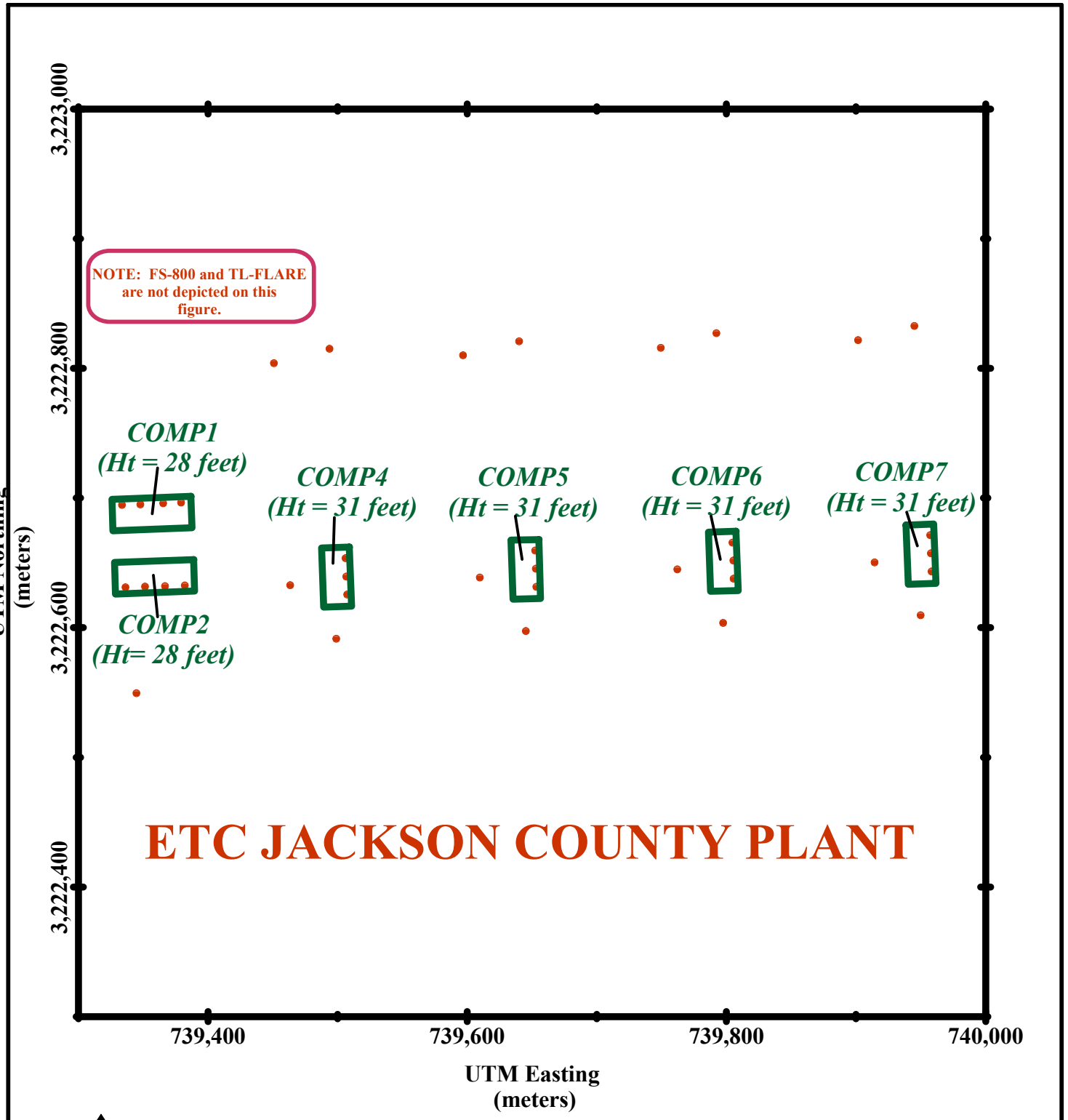
The Project is located in a rolling terrain region. Figure 4-1 shows that within approximately three kilometers of the Project site, well over 90 percent of the region can be classified as having rural land use, primarily the A2 and A3 land use classification types. Therefore, the land use for the AQA was classified as rural, and, as discussed in Section 12, the "medium roughness" meteorological TCEQ AERMET data set was used in the AQA.

Because of the obvious rural classification of the region this PSDAQA Report does not contain a detailed Auer land use analysis mosaic diagram.

9. BUILDING WAKE EFFECTS (DOWNWASH)

The AERMOD downwash analysis was conducted using the EPA's Building Profile Input Program (i.e., BPIP) with Plume Rise Enhancements (i.e., PRIME) algorithm, or BPIP-PRIME (dated 04274), which is incorporated into the AERMOD modeling software package, to calculate direction-dependent downwash dimensions for the Project point sources. The BPIP-PRIME algorithm imported structure and emission point information into AERMOD on a source number- and structure number-specific basis.

Figure 9-1, which was created from Figure 6-1 in this AQA Report, depicts the layout of the Project's significant structures and emission points. The height of each significant Project structure is included on Figure 9-1.



Downwash structures (compressor buildings) are labeled in green.

Red dots are ETC Jackson County Plant criteria air pollutant point sources.

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Jackson Couty Plant

FIGURE 9-1
Plant Structures and Heights, and Point Sources
November 2011

10. RECEPTOR DISTRIBUTIONS—TERRAIN

The Project is located in a region with relatively rolling terrain. Therefore, terrain heights were AERMOD inputs for all emission sources, structures, and receptors. The terrain heights were derived by incorporating 30-meter resolution National Elevation Data (NED) data into the AERMOD input file using the AERMAP algorithm.

11. RECEPTOR DISTRIBUTIONS—DESIGN

The design of the receptor distributions used in the AQA is in accordance with the TCEQ AQMG Sections 5.5 and 9.4 specifications. The following sections describe the receptor distributions that were used.

Figures 11-1, 11-2, and 11-3 depict the receptor distribution that was used in the Preliminary Impact Determinations, illustrating both the full distribution and close-up views of the near-Plant receptors (i.e., the tight, fine, and medium-spaced receptors). The distribution emphasizes tight and fine receptor spacing in the vicinity of the Plant because the maximum predicted Plant concentrations of all criteria air pollutants occurred at or near the Plant fence lines due to aerodynamic downwash effects (i.e., all Plant emission points are affected by building downwash effects). The maximum predicted concentrations monotonically decreased with increasing radial distance from the Plant emission points because of the downwash influences. Moreover, the Project ROIs are limited in radial extent, extending no more than approximately 1 kilometer from the Plant fence line for annual and 24-Hour $PM_{2.5}$, and annual NO_2.

As Figure 11-1 illustrates, the full receptor distribution consisted of 2,040 receptors. The receptor spacing approach was as follows:

- 25-meter (tight) spacing along the Plant fence line, plus four rows of 25-meters spaced receptors extending out to 100 meters from the property/fence lines,
- 100-meter (fine) spaced grids extending out to a distance of at least 1,000 meters in all directions from the Plant fence line, and
- 500-meter (medium) spaced grids covering the area that lies between 1,000 meters and 5,000 meters from the Plant fence line

Figure 11-2 shows the 25-meter, 100-meter, and 500-meter spaced receptors within a 5-kilometer by 5-kilometer intermediate-range view of the receptor distribution shown in Figure 11-1.

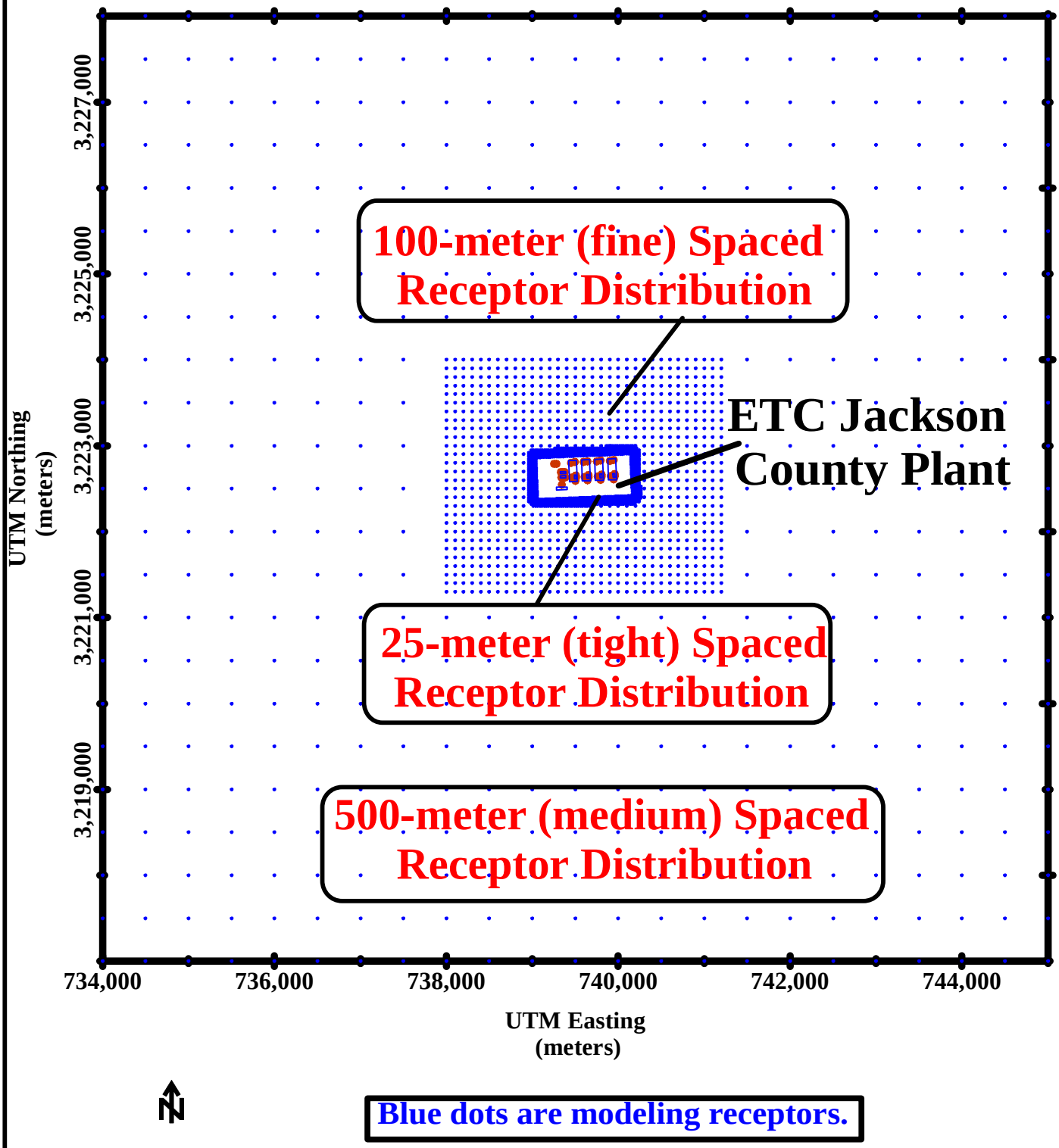

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FIGURE 11-1
Full Basic Receptor Distribution
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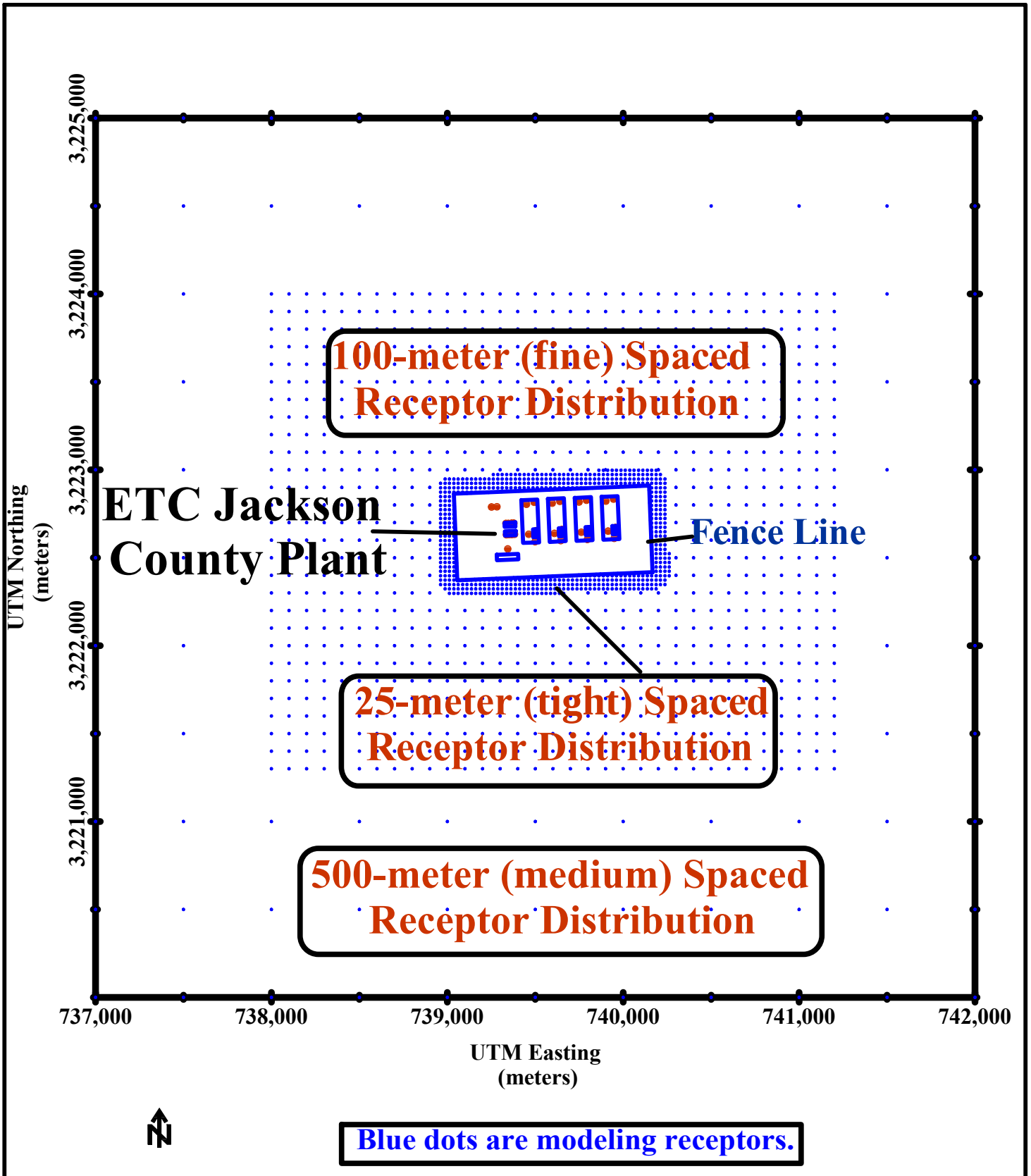

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FIGURE 11-2
Medium, Fine, and Tight Receptor Distribution, Plant Location, and Fence Line
November 2011

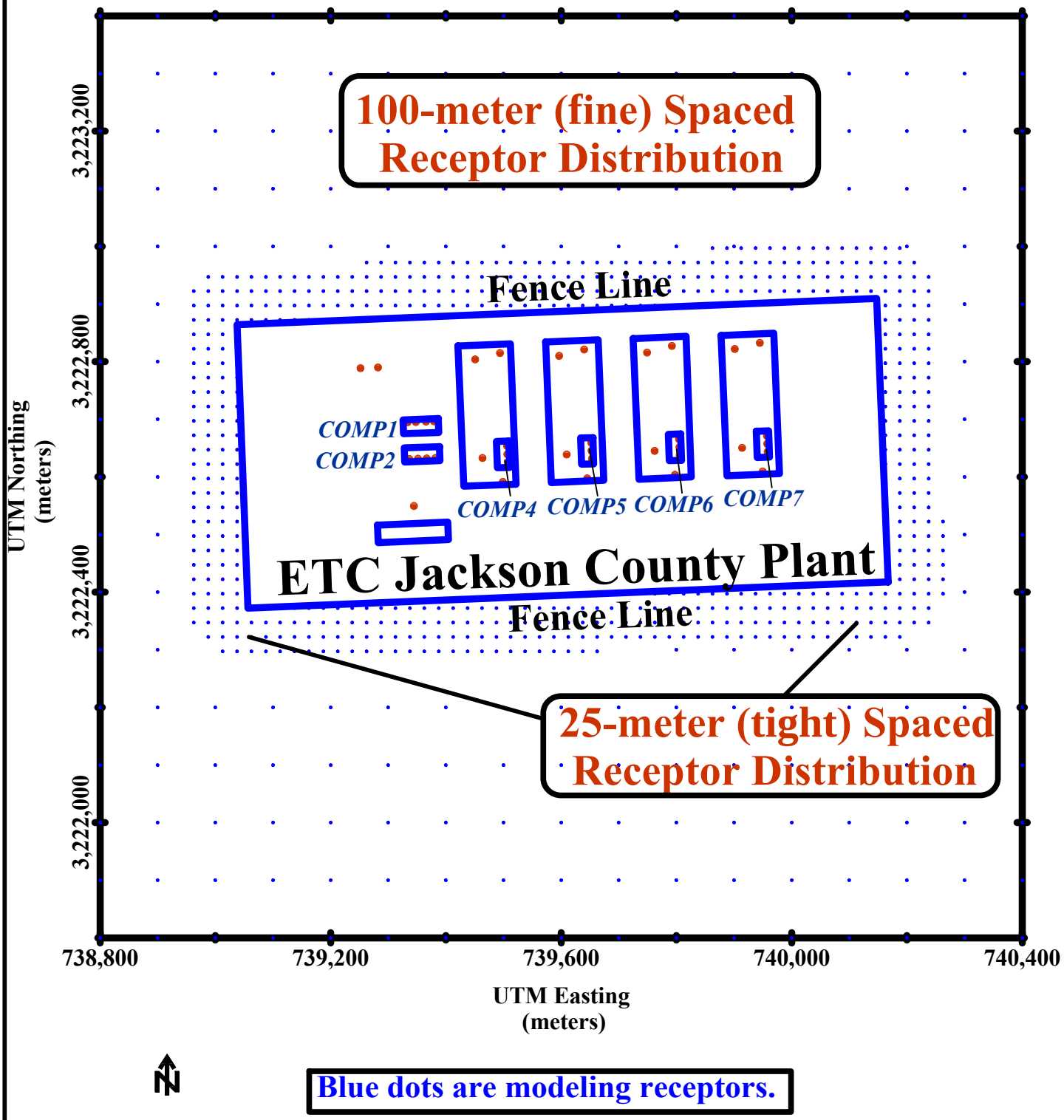

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FIGURE 11-3
Fine and Tight Receptor Distribution, Plant Features, and Fence Line
November 2011

Figure 11-3 shows a 1.6-kilometer by 1.6-kilometer close-up view of the 25-meter spaced receptor distribution that surrounds the Plant and a portion of the 100-meter receptor distribution shown in Figures 11-1 and 11-2. Figure 11-3 shows in expanded detail the Plant structures and emission points, the Plant structures, the Plant property/fence line, and the 25-meter space receptor grid encompassing the nearest residence.

11.1 Receptor Adequacy

As detailed in Section 5.5.2 of the TCEQ AQMG, the distribution of 25-meter, 100-meter and 500-meter spaced receptors that was used in this analysis is in accordance with the TCEQ ADMT receptor distribution requirements. The AQA results demonstrate that the design concentrations are nested within the receptor distribution in each modeling run.

The design concentrations occur at near-field receptors having 25-meter spacing. The concentrations decrease with increasing distance from the Plant, so that the maximum concentrations occur at the receptors along the Plant fence line.

Additional receptors were not needed for any analyses because concentration "hotspots" occurred only at 25–meter spaced receptors.

11.2 Receptor Generation Procedures

As stated previously in this section, in accordance with TCEQ ADMT receptor placement guidance, the basic receptor distribution was comprised of the following elements:

- 25-meter spaced (i.e., tight) receptors along the fence line,
- four rows of 25-meter spaced receptors extending out to approximately 100 meters in all directions from the Plant fence line,
- 100-meter spaced (i.e., fine) receptors extending out to approximately 1,000 meters in all directions from the Plant fence line, and
- 500-meter spaced (i.e., fine) receptors extending out to approximately 5,000 meters in all directions from the Plant fence line.

All basic gridded receptors were automatically generated by the AERMOD model interface algorithm, using the "Special Grid" feature.

12. METEOROLOGICAL DATA

This section describes the meteorological data that were used in the AQA. Because the Project is in Jackson County, as recommended in the TCEQ AQMG the meteorological data set comprised of surface data from the Victoria, Texas surface station (VCT) and upper air profiles from the Victoria, Texas upper air station (VCT) were used for the AQA. The TCEQ ADMT preprocessed these data using the AERMET (Version 06341) module of AERMOD, incorporating the VCT surface data and VCT upper air profile data as inpuFiveears of VCT/VCT meteorological data (i.e., the 1983, 1984, 1986, 1987, and 1988 data years, as recommended and provided by the TCEQ ADMT in the *Jackson5Y* directory on the TCEQ Internet web site) were used for the performance of Preliminary Impacts Determination analyses to predicted the maximum concentrations and to identify the pollutants that have impacts larger than the SILs and the associated ROI(s) for those pollutants.

Details of the meteorological data inputs and the associated considerations are discussed in the following sections.

12.1 Roughness Length

As shown in Figure 4-1, the region over which the Project emissions will be released and disperse during transport to the near-field receptors has a low-to-medium roughness length because the terrain is relatively rolling and the land use in the vicinity is mostly agricultural or undeveloped (i.e., Auer Categories A1, A2, and A3). In accordance with TCEQ verbal and written guidance, the EPA's AERSURFACE (dated 08009) algorithm and downloaded land usage data inputs were used to determine which of the TCEQ roughness-height meteorological data sets (i.e., the "low roughness" data set that represents a 0.05-meter roughness length or the "medium roughness" data set that represents a 0.5-meter roughness length) would be more applicable to the Project region.

Table 12-1 presents the AERSURFACE analysis output. AERSURFACE computed that the roughness length for the region within a one- kilometer radius of the Project centroid is 0.118 meter. Because this roughness length is within the 0.1-meter to 0.7-meter roughness length range that the TCEQ associates with a medium roughness length, the VCTVYYD**M**.SFC [surface] and VCTVYYD**M**.PFL [upper air] meteorological data sets, where YY is the data year, were the AERMET inputs to AERMOD for this AQA. The default Bowen ratio and albedo values that the TCEQ has incorporated into the *.SFC meteorological data sets were used without revision.

12.2 Other Modeling Evaluation Criteria

As discussed in Section 8 of this AQA Report, within approximately three kilometers of the Project site, well over 90 percent of the region can be classified as having rural land use, primarily the A2 and A3 land use classification types. Therefore, the land use for the AQA was classified as rural.

A profile base elevation of 107 feet msl (32.6 meters), the mean elevation of the Project emission points, was input to AERMOD.

TABLE 12-1
AERSURFACE ROUGHNESS LENGTH OUTPUT
ETC TEXAS PIPELINE,LTD., JACKSON COUNTY PLANT

```
** Generated by AERSURFACE, dated 08009
** Center UTM Easting (meters):    739600.0
** Center UTM Northing (meters):  3222700.0
** UTM Zone:  14    Datum: NAD83
** Study radius (km) for surface roughness:   1.0
** Airport? N, Continuous snow cover? N
** Surface moisture? Average, Arid region? N
** Month/Season assignments? Default
** Late autumn after frost and harvest, or winter with no snow: 12 1 2
** Winter with continuous snow on the ground: 0
** Transitional spring (partial green coverage, short annuals): 3 4 5
** Midsummer with lush vegetation: 6 7 8
** Autumn with unharvested cropland: 9 10 11
**
   FREQ_SECT  ANNUAL  1
   SECTOR   1    0  360
**                    Sect    Alb      Bo        Zo
   SITE_CHAR    1       1     0.17     0.57     0.118
```

13. MODELING RESULTS

Section 13 of this AQA Report presents the AQA results. Table 13-1 presents the analysis results, including:

- Preliminary Impact Determinations, including the maximum predicted impacts compared with the respective SILs (and the ROIs for those compounds having impact[s] above the applicable SIL[s]),
- EPA/TCEQ Significant Impact Levels,
- Ambient Monitoring Background Concentration,
- Total Design Concentration, and
- Secondary NAAQS

Table 13-1 demonstrates that the Project impacts will be above the respective SIL for only annual $PM_{2.5}$, 24-hour $PM_{2.5}$, and annual NO_2, and the radii of impact for those criteria air pollutants will be 1 kilometer or less. In addition, as Table 13-1 shows, all maximum predicted Project impacts, with the appropriate background concentration included, will be below the applicable secondary NAAQS.

Considering the annual NO_2 and annual/24-hour $PM_{2.5}$ analysis results individually:

13.1 NO_2

As shown in Table 13-1 and Figure 13-1, the maximum predicted annual NO_2 Project impact 5.29 ug/m^3 using a concatenated 5-year meteorological data period of record. This concentration is above the SIL of 1 ug/m; however, the annual NO_2 radius of significant impact is only 1 kilometer.

As discussed in Section 5, the applicable annual NO_2 ambient monitoring background concentration is 4.95 ug/m^3. This results in a total design concentration of 10.24 ug/m^3 for annual NO_2, which is wellbelow the annual secondary NAAQS of 100 ug/m^3.

TABLE 13-1

MAXIMUM PREDICTED PROJECT NO_2, $PM_{2.5}$, PM_{10}, AND SO_2 IMPACTS FOR THE CRITERIA AIR POLLUTANTS/AVERAGING PERIODS HAVING A SECONDARY NAAQS

ETC TEXAS PIPELINE, LTD., JACKSON COUNTY PLANT

Criteria Air Pollutant Having a Secondary NAAQS	Averaging Period	EPA/TCEQ Significant Impact Level[a] (µg/m³)	Maximum Predicted Project Impact (µg/m³)	Maximum Predicted Project Impact Above the Applicable Significant Impact Level ?	Radius of Significant Impact (km)	Applicable Ambient Monitoring Background Concentration (µg/m³)	Total Design Concentration (µg/m³)[i]	Secondary NAAQS (µg/m³)
NO_2	Annual	1	5.29[b]	**Yes**	1.0	4.95[e]	10.24	100
$PM_{2.5}$	Annual	0.3	1.11[b]	**Yes**	0.9	10.14[f]	11.25	15
$PM_{2.5}$	24-Hour	1.2	3.55[b]	**Yes**	1.0	21.97[g]	25.52	35
PM_{10}	24-hour	5	3.92[c]	**No**	**N/A**	**N/A[h]**	**N/A**	150
SO_2	3-hour	25	3.02[d]	**No**	**N/A**	**N/A[h]**	**N/A**	1,300

[a] The Significant Impact Level concentration is commonly referred to as the SIL.

[b] The maximum modeled Project impact was predicted using a concatenated 5-year meteorological data period-of-record, in accordance with EPA and TCEQ modeling guidance.

[c] The maximum modeled Project impact was predicted using 5 individual years of meteorological data, in accordance with EPA and TCEQ modeling guidance.

[d] The maximum modeled Project impact was predicted using one year of meteorological data, in accordance with TCEQ modeling guidance for a State modeling analysis. The Project does not trigger PSD review for SO_2, so that only a State modeling analysis is required to analyze Project impacts.

[e] The annual NO_2 background concentration is a 3-year average (i.e., for 2008, 2009, and 2010, the most recent 3-year period, in accordance with EPA and TCEQ guidance) of the three individual-year ambient annual average NO_2 concentrations monitored at the TCEQ CAMS 618 station at Danciger, (in western Brazoria County) Texas. The CAMS 618 data are the most applicable, representative NO_2 background monitoring data available for the Project location in Jackson County, Texas.

[f] The annual $PM_{2.5}$ background concentration is a 3-year average (i.e., for 2008, 2009, and 2010, the most recent 3-year period, in accordance with EPA and TCEQ guidance) of the three individual-year ambient annual average $PM_{2.5}$ concentrations monitored at the TCEQ CAMS 45 station at Seabrook Friendship Park, in Harris County, Texas. The CAMS 45 data are the most applicable, representative $PM_{2.5}$ background monitoring data available for the Project location. Ambient $PM_{2.5}$ monitoring data are also available for the TCEQ CAMS 38 station in northwestern Travis County for the 2008-2010 period, but the CAMS 45 data are slightly more conservative than the CAM 38 data (i.e., the CAMS 45 annual $PM_{2.5}$ concentration is slightly higher than the CAMS 38 annual $PM_{2.5}$ concentration), so the CAMS 45 data were used for this analysis.

[g] The 24-hour $PM_{2.5}$ background concentration is a 3-year average (i.e., for 2008, 2009, and 2010, the most recent 3-year period, in accordance with EPA and TCEQ guidance) of the three individual-year highest, eighth highest 24-hour average $PM_{2.5}$ concentrations monitored at the TCEQ CAMS 45 station at Seabrook Friendship Park, in Harris County, Texas. The CAMS 45 data are the most applicable, representative $PM_{2.5}$ background monitoring data available for the Project location. Ambient $PM_{2.5}$ monitoring data are also available for the TCEQ CAMS 38 station in northwestern Travis County for the 2008-2010 period, but the CAMS 45 data are slightly more conservative than the CAM 38 data (i.e., the CAMS 45 3-year average highest, eighth highest 24-hour $PM_{2.5}$ concentration is slightly higher than the CAMS 38 design 24-hour $PM_{2.5}$ concentration), so the CAMS 45 data were used for this analysis.

[h] Ambient monitoring data are not required for this criteria air pollutant and averaging period because the design Project impact is below the applicable SIL.

[I] The total design concentration, in µg/m³, is derived by adding the maximum predicted impact to the background concentration.

13.2 $PM_{2.5}$

13.2.1 Annual $PM_{2.5}$

As shown in Table 13-1 and Figure 13-2, the maximum predicted annual $PM_{2.5}$ Project impact was 1.11 ug/m^3 using a concatenated 5-year meteorological data period of record. This concentration is above the SIL of 0.3 ug/m; however, the annual $PM_{2.5}$ radius of significant impact is only 0.9 kilometer.

As discussed in Section 5, the applicable annual $PM_{2.5}$ ambient monitoring background concentration is 10.14 ug/m^3. This results in a total design concentration of 11.25 ug/m^3 for annual $PM_{2.5}$, which is below the annual secondary NAAQS of 15 ug/m^3

13.2.2 24-Hour $PM_{2.5}$

As shown in Table 13-1 and Figure 13-3, the maximum predicted 24-hour $PM_{2.5}$ Project impact was 3.55 ug/m^3 using a concatenated 5-year meteorological data period of record. This concentration is above the SIL of 1.2 ug/m; however, the 24-hour $PM_{2.5}$ radius of significant impact is only 1 kilometer.

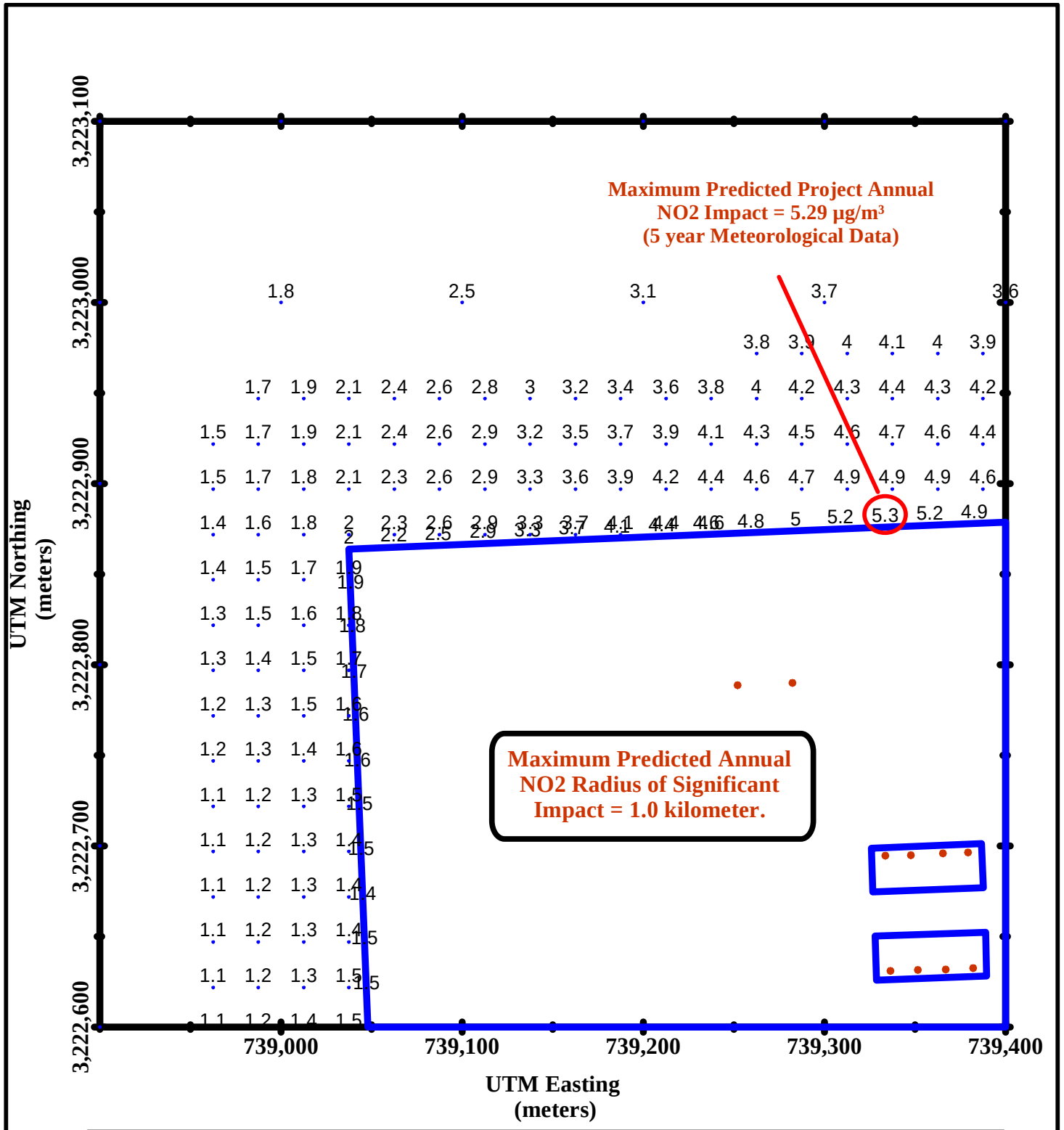
As discussed in Section 5, the applicable annual $PM_{2.5}$ ambient monitoring background concentration is 21.97 ug/m^3. This results in a total design concentration of 25.52 ug/m^3 for annual $PM_{2.5}$, which is below the annual secondary NAAQS of 35 ug/m^3

13.2.3 PM_{10}

The maximum Ppredicted Project 24-hour PM_{10} impact was determined to be 3.92 ug/m3 using five individual years of meteorological data. This is below the SIL of 5 ug/m^3 ;therefore, 24-hour PM_{10} required no further analysis.

13.2.4 SO_2

The maximum predicted Project 3-hour SO_2 impact was determined to be 3.02 ug/m^3 using one year of meteorological data. This is below the SIL of 25 ug/m^3; therefore, 3-hour SO_2 required no further analysis.



Annual NO2 Significant Impact Level Concentration = 1.0 µg/m³

NOTE: Concentrations are in µg/m³.

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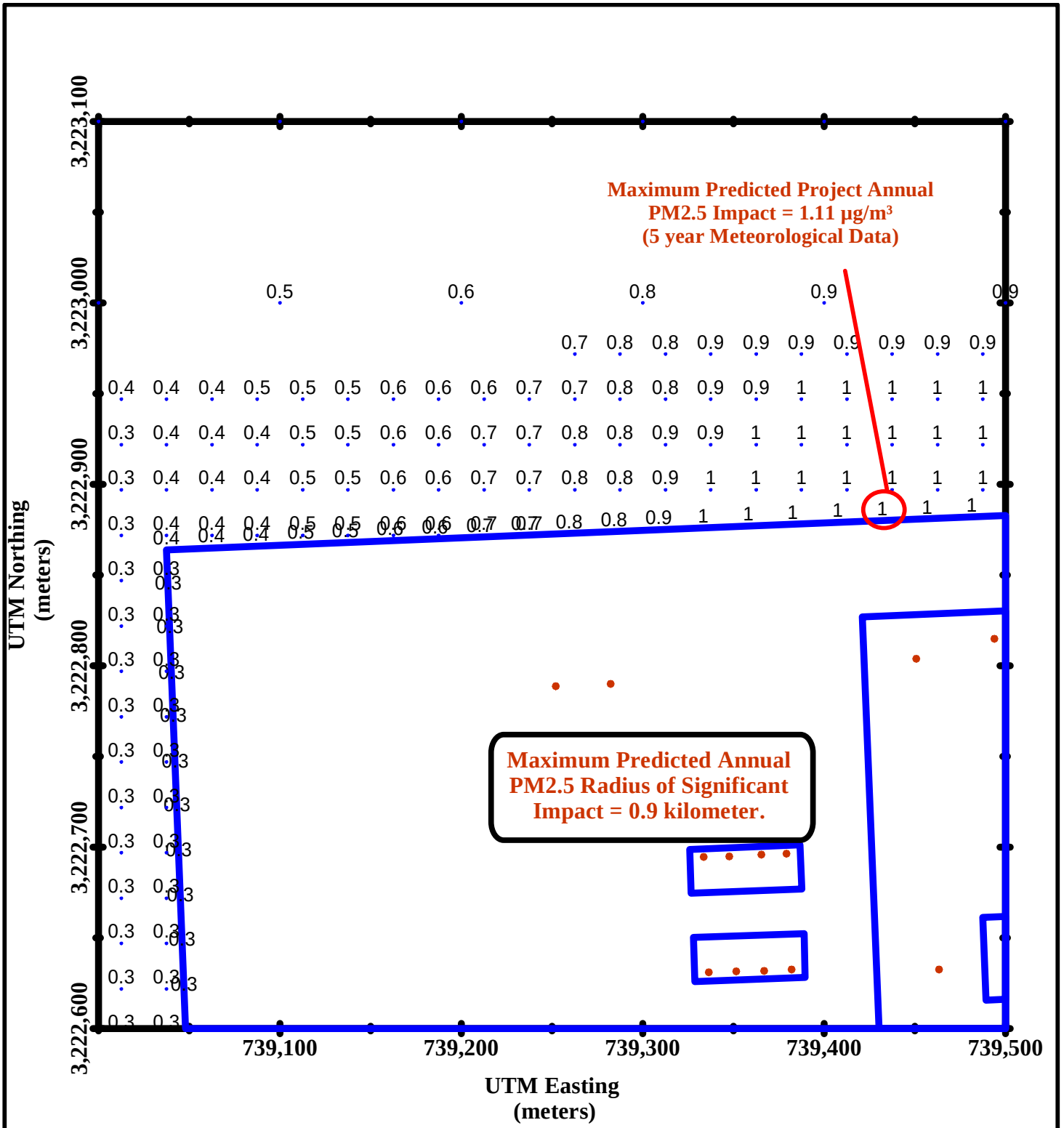
FIGURE 13-1
Maximum Predicted Annual NO2 Concentrations
November 2011



Annual PM2.5 Significant Impact Level Concentration = 0.3 µg/m³

NOTE: Concentrations are in µg/m³.

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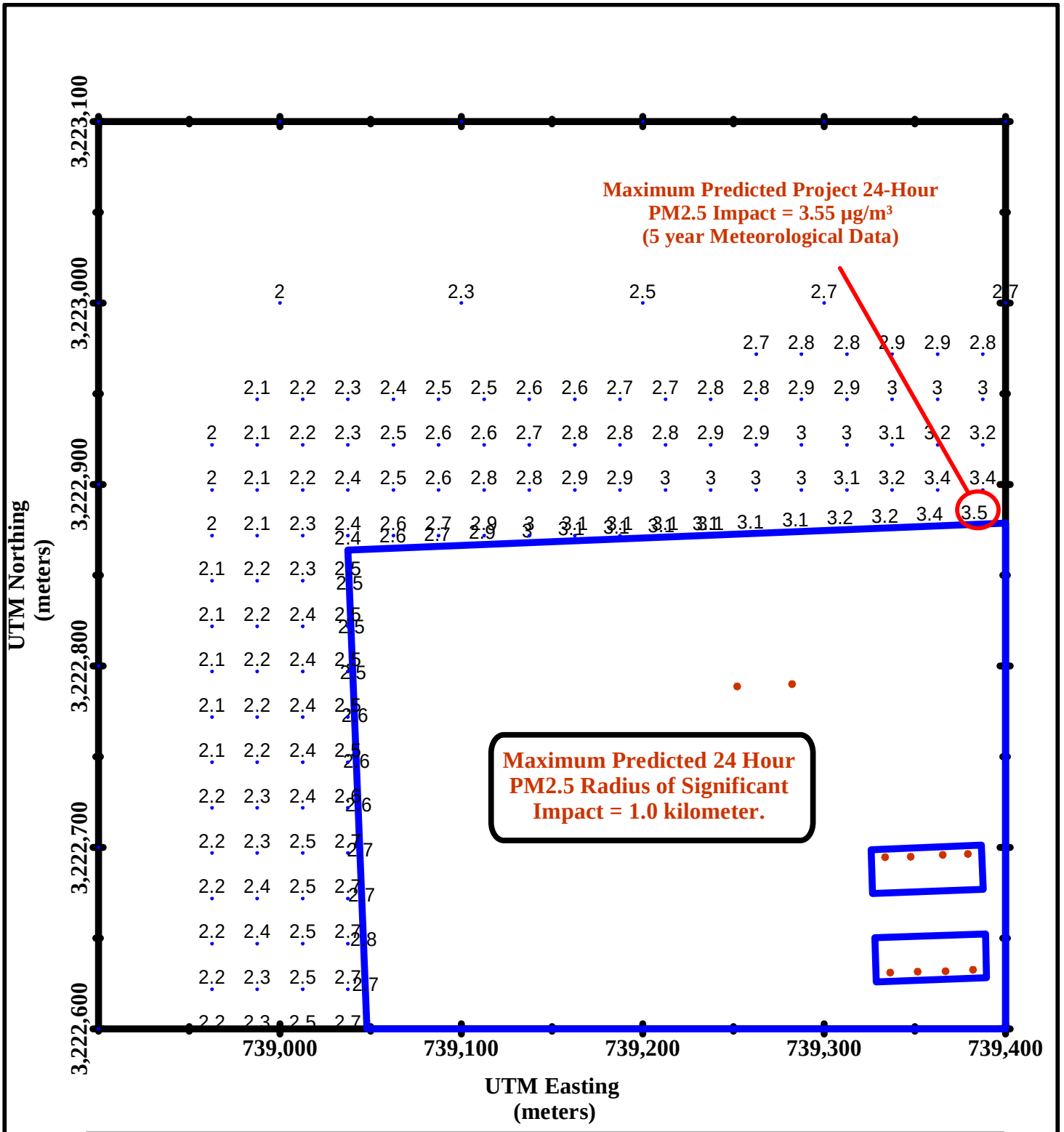
FIGURE 13-2
Maximum Predicted Annual PM2.5 Concentrations
November 2011



24 Hour PM2.5 Significant Impact Level Concentration = 1.2 µg/m³

NOTE: Concentrations are in µg/m³.

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FIGURE 13-3
Maximum Predicted 24 Hour PM2.5 Concentrations
November 2011

14. REFERENCES

EPA, 1990. New Source Review Workshop Manual: Prevention of Significant Deterioration and Nonattainment Area Permitting. (Draft), October 1990.

EPA, 2005. Guideline on Air Quality Models, 40 CFR Part 51, Appendix W, 2005.

EPA, 2008. Ambient PM_{10} and ozone data for 2007 obtained/downloaded from the EPA Internet web site.

ETC, 2011. Project and plant data received by TITAN from ETC during 2011.

TCEQ, 1999. Texas Commission on Environmental Quality, Air Quality Modeling Guidelines RG-25 (Revised February 1999).

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APPENDIX B

OPERATIONS NOISE PREDICTION ANALYSIS AND DISCUSSION

Compressor Station Noise Analysis
Jackson County Gas Plant
ETC Texas Pipeline, LTD
Jackson County, Texas

The most significant noise sources within a natural gas processing or compressor facility are the engine exhausts from the compressor drives and the fin fan water coolers for the engine units. The Jackson County Gas Plant will contain two (2) compressor buildings housing four (4) 3606 Caterpillar Drive Units in each building, and four (4) compressor buildings within each process plant area housing three (3) 3616 Caterpillar Drive Units in each building. Each compressor building will have a metal external wall lined with a mineral wool fiber that attenuates noise transmission within and external to the structure. Hospital-grade silencers will be used on the exhaust of each compressor drive to further reduce noise from each engine.

The two (2) sets of 3606 Compressors are planned within the west central portion of the 140 acre tract and are 550 foot (ft), 800 ft, 900 ft, and 2,500 ft distant from the 4 property boundaries. The analysis for the 3606 Compressors are based on the to 550 ft distance to the north property line.

The four (4) sets of 3616 Compressors are located in the center of the tract, east to west, commencing in the gas processing area east of the 3606 Compressors. Each set of 3616 Compressors has a minimum of 400 ft separation between the buildings housing the units. The distances to the nearest property line from any individual 3616 Compressor building are 575 ft, 750 ft, 800 ft, and 1,500 ft. The analysis for the 3616 Compressors are based on the eastern most building located 575 ft from the east property line.

As shown on the attached noise analysis sheets, standard federal agency Noise Assessment Guidelines and methods of calculation were used in all the analysis. Manufacturer's data from Caterpillar, and industry standard noise level typical data were used for various noise generating components for each bank of compressors.

Predicted Noise Analysis Results

Some context is required to provide perspective on calculated noise levels at a receptor or given distance and should be compared to noise sources the public can directly relate to. From previous project noise analyses, a pickup truck passing on a paved road 50 ft. away produces an averaged reading of 80 dBA, a 235LC Caterpillar backhoe 85 dBA, and a D6LGP bulldozer 80 dBA. A conversation between two individuals at 3 ft. of distance from the audio dosimeter generates readings from 77 to 83 dBA.

Many federal agencies have adopted a 55 Leveled day-night (Ldn) dBA as a predicted or measured noise threshold for determining "no effect" for noise sources. The Ldn calculation applies a penalty to night time noise to account for the perceived noise enhancement of a source during night hours, and the 55 Ldn dBA equates to 49 dBA as measured by instruments or calculated result.

3606 Water Coolers and Compressor Engines

As presented on the attached analysis sheets the predicted noise levels from the 3606 engine coolers at the nearest property line is 53.9 dBA, and distance to the 55 Ldn dBA threshold is 1,175 ft, an additional 625 ft past the property line.

The 3606 Compressor engine noise analysis results in predicted noise levels at the north property line of 44.05 dBA, below the 55 Ldn dBA level.

3616 Water Coolers and Compressor Engines

As presented on the attached analysis sheets the predicted noise levels from the 3616 engine coolers at the east property line is 52.7 dBA, and distance to the 55 Ldn dBA threshold is 1,010 ft, an additional 435 ft past the property line.

The 3616 Compressor engine noise analysis results in predicted noise levels at the east property line of 41.7 dBA.

Results Discussion on Affects to Wildlife

The predicted noise levels from operations of the 3606 or 3616 Compressors results in a conclusion of no effect since the predicted noise levels at the nearest property line are at or below the Community Noise level threshold of 55 Ldn dBA, or 49 Leq dBA.

The predicated noise levels from the water coolers are above the 55 Ldn dBA, or 49 Leq dBA threshold, extending beyond the north property line by 625 ft to the north, and 435 ft to the east.

The water cooler results for the 3606 units and distance to all property lines indicates no transient noise to any other property line other than to the north. The water cooler results for the 3616 units indicates that noise levels above 55 Ldn dBA, or 49 Leq dBA will occur to the north, east, and south property lines in diminishing degree based on the distance.

In general, though noise from operations will be perceptible to humans and wildlife to some extent immediately adjacent to the north, east, and south property lines, little to no effect to endemic wildlife is expected since the noise sources are constant and limited, rather that abrupt and excessive. The 52.7 dBA level from the 3616 engine coolers at the east property line is less than measured noise from passing vehicles at near distances, and less than many types of noise that are casually disregarded by humans and wildlife.

The USEPA study “Effects of Noise on Wildlife and Other Animals” published in 1971, and referenced basis document on this subject, reported no discernible effects to any types of wildlife or animal species from noise sources less than 70 Leq dBA.

GAI concludes that noise from operations of the proposed Project will have no direct, indirect, or cumulative effect to noise sensitive receptors outside the property limits.

3606 Water Cooler Noise Calculations
Jackson County Gas Plant
ETC Texas Pipeline, LTD
Jackson County, Texas

Water Cooler 4 Addition to Cooler 3

db2	db1	10	a	log	R2	R1
72.87	81.9	10	1		24	3

72.8 added to 81.9 equals 9.1 difference, add 1 decibel = 82.9

Water Cooler 3 Addition to Cooler 2

db2	db1	10	a	log	R2	R1
73.87	82.9	10	1		24	3

73.8 added to 82.9 equals 9.1 difference add one to 82.9 = 83.9

Water Cooler 2 Addition to Cooler 1

db2	db1	10	a	log	R2	R1
74.87	83.9	10	1		24	3

74.8 added to 83.9 equals 9.1 difference add one to 83.9 = 84.9

Calculated Combined Noise Output at 1 Meter parallel to all Water Coolers: 85 dB(A).

Units Perpendicular Combined Noise Calculation

81.9 + 81.9+ 81.9 + 81.9 = **87.9 dB(A)** Use highest number for assessment

Formula to calculate atmospheric loss over distance give drop off rate coefficient
Coefficient rate of 1.5 for straight line, with ground absorption
db2 = db1 - 10 x A x Log (R2/R1)

Noise Calculation to Property Line located 550 foot north of 3606 Compressor Building

db2	db1	10	a	log	R2	R1
53.95	87.9	10	1.5		550	3

Calculated Distance to 55 Ldn dBA threshold of 49 Leq dBA

db2	db1	10	a	log	R2	R1
49.01	87.9	10	1.5		**1175**	3

3616 Water Cooler Noise Calculations
Jackson County Gas Plant
ETC Texas Pipeline, LTD
Jackson County, Texas

Water Cooler 3 Addition to Cooler 2

db2	db1	10	a	log	R2	R1
72.87	81.9	10	1		24	3

72.8 added to 81.9 equals 9.1 difference, add 1 decibel = 82.9

Water Cooler 2 Addition to Cooler 1

db2	db1	10	a	log	R2	R1
73.87	82.9	10	1		24	3

73.8 added to 82.9 equals 9.1 difference add one to 82.9 = 83.9

Calculated Combined Noise Output at 1 Meter parallel to all Water Coolers: 84 dB(A).

Units Perpendicular Combined Noise Calculation

81.9 + 81.9+ 81.9 = 86.9 dB(A) Add 3 dBA, then 2 Use highest noise potential for assessment

Formula to calculate atmospheric loss over distance give drop off rate coefficient
Coefficient rate of 1.5 for straight line, with ground absorption
db2 = db1 - 10 x A x Log (R2/R1)

Noise Calculation to Property Line located 575 foot east of 3616 Compressor Building

db2	db1	10	a	log	R2	R1
52.76	87	10	1.5		575	3

Calculated Noise Level from 3616 Water Coolers Property Line, no attenuation: 52.76 dBA

Calculated Distance from 3616 Water Coolers to 55 Ldn dBA)(49 Leq dBA)

db2	db1	10	a	log	R2	R1
49.09	87	10	1.5		**1010**	3

3616 Compressor Building Noise Calculations
Jackson County Gas Plant
ETC Texas Pipeline, LTD
Jackson County, Texas

Typical IC Gas Fired Engine Mechanical Sound at 3 feet

Octave Band Center Frequencey: dB(A) Calcuation

32 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2kHz	4 kHz	8 kHz	dB(A)
82.7	89.7	96.5	93	91	90.8	93.1	94.9	89.7	**99**

Air Intake with Silencer Attenuation Applied

32 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2kHz	4 kHz	8 kHz	dB(A)
91.5	91.5	91.9	94.9	94.9	100	106.8	118.2	117.5	122
	-5	-13	-22	-28	-35	-42	-50	-47	
91.5	86.5	78.9	72.9	66.9	65	64.8	68.2	70.5	**77**

Compressor Units

Typical 4 Cylinder Single Stage Compressor Unit is **98 dBA @1000 RPM**

Decibel Addition Results of Engine + Compressor + Intake (99 + 98 + 77) = 101 dB(A)

Decibel Addition of Three 3616 Units Running: 101 +101 +101 = 105 dB(A) Add 3 dBA, then 2

Attenuation of Building

32 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2kHz	4 kHz	8 kHz
-6	-12	-18	-25	-30	-32	-35	-38	-38

Attentuation Value of Building; 29 dB(A)

Calculated Sound Contribution Outside of Compressor Building: 76 dB(A)

Noise Calculation to nearest property line, located 175 foot east of eastern most 3616 Compressors

Formula to calculate atmospheric loss over distance give drop off rate coefficient
Coefficient rate of 1.5 for straight line, with ground absorption
db2 = db1 - 10 x A x Log (R2/R1)

db2	db1	10	a	log	R2	R1
41.76	76	10	1.5		**575**	3

Calculated Noise Level from 3616 Compressor Building at Property Line, no attenuation: 41.7 dBA

3606 Compressor Building Noise Calculations
Jackson County Gas Plant
ETC Texas Pipeline, LTD
Jackson County, Texas

Typical IC Gas Fired Engine Mechanical Sound at 3 feet

Octave Band Center Frequencey: dB(A) Calcuation

32 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2kHz	4 kHz	8 kHz	dB(A)
82.7	89.7	96.5	93	91	90.8	93.1	94.9	89.7	**99**

Air Intake with Silencer Attenuation Applied

32 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2kHz	4 kHz	8 kHz	dB(A)
91.5	91.5	91.9	94.9	94.9	100	106.8	118.2	117.5	122
	-5	-13	-22	-28	-35	-42	-50	-47	
91.5	86.5	78.9	72.9	66.9	65	64.8	68.2	70.5	**77**

Compressor Units

Typical 4 Cylinder Single Stage Compressor Unit is **98 dBA @1000 RPM**

Decibel Addition Results of Engine + Compressor + Intake (99 + 98 + 77) = 101 dB(A)

Decibel Addition of Four 3606 Units Running: 101 +101 +101 + 101 = 107 dB(A)

Attenuation of Building

32 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2kHz	4 kHz	8 kHz
-6	-12	-18	-25	-30	-32	-35	-38	-38

Attentuation Value of Building; 29 dB(A)

Calculated Sound Contribution Outside of Compressor Building: 78 dB(A)

Noise Calculation to nearest property line, located 550 foot north of northern most set of 3606 Compressors

Formula to calculate atmospheric loss over distance give drop off rate coefficient
Coefficient rate of 1.5 for straight line, with ground absorption
db2 = db1 - 10 x A x Log (R2/R1)

db2	db1	10	a	log	R2	R1
44.05	78	10	1.5		550	3

Calculated Noise Level from 3606 Compressor Building at Property Line, no attenuation: 44.5 dBA

APPENDIX C

MITIGATION STRATEGIES FOR VERTICAL STRUCTURES AND POWER-LINES

MITIGATION STRATEGIES FOR VERTICAL STRUCTURES AND POWER-LINES

Mitigation strategies for overhead transmission lines and communication towers have been developed by electrical transmission and communication industries in response to U.S. Fish and Wildlife Service (USFWS) concerns due to documented levels of bird mortality.

General mitigation strategies for decreasing potential powerline impacts to birds include:

1. Covering jumper wires, conductors and equipment;
2. Discouraging perching in unsafe areas;
3. Reframing;
4. Replacing a structure; or
5. Retrofitting to prevent collisions which may include:
   a. Installing markers to enhance the visibility of lines;
   b. Managing habitats to reduce the likelihood of birds crossing lines during daily flights; or
   c. Managing human activity near collision risk areas to prevent flushing.

Commercially available examples of Bird Electrical Line Controls include:

1. Firefly Bird Flapper / Flight Diverter- Protects birds from collisions with overhead power lines and communications towers by incorporating motion, reflectivity, and light emissions to alert the birds of an upcoming obstruction.

2. Bird Pressure Level (Light – Medium)- Made of impact-resistant and UV-stabilized acrylic plastic with fluorescent reflective sheeting, a stainless steel ball bearing swivel system and patented ABS–Makrolon plastic snapfast mounting clamp with stainless–steel spring action, it is effective for bats and all bird species, it is best used for power lines, guy wires and electrical towers. (http://www.birdbusters.com/bird_control_products.html)

Additional measures for decreasing the potential bird impacts resulting from interaction of power lines and towers includes:

- If taller communication towers, more than 199 feet or 61 meters above ground level, are being installed and require lighting to warn aircraft pilots, the minimum amount of warning and obstruction lighting required by the Federal Aviation Administration (FAA) should be used. Where permissible by the FAA and local zoning regulations, only white strobe lights should be used at night. These should be up-shielded to minimize disruption to local residents, should be the minimum number needed, with minimum intensity and number of flashes per minute (i.e., the longest duration between flashes is currently three seconds) allowed by the FAA. The use of solid red or pulsating red warning lights should be avoided at night. Construction techniques not requiring the use of guy wires should be employed whenever possible.

- Guy wire supported towers constructed in known raptor or water-bird concentration areas should use daytime visual markers (e.g. bird diverter devices) on the guy wires to prevent collisions by these diurnal species.

- Towers should be constructed in a way that limits or minimizes habitat loss within the tower "footprint." Road access and fencing should be minimized to reduce or prevent habitat fragmentation and disturbance, and to reduce above-ground obstacles that might impact birds in flight. However, a larger tower footprint is preferable to the construction of a guy-supported tower.

- New towers should be designed structurally and electrically to accommodate the applicant's antenna(s), and comparable antenna(s) for at least two (2) additional users, to reduce the number of future towers, unless this design would require the addition of lights or guy wires to an otherwise unlighted and/or un-guyed tower.

- Security lighting for on-ground facilities and equipment should be down-shielded to keep light within the boundaries of the site and minimize its potential attraction for birds.

- If a tower is constructed or proposed for construction, USFWS personnel and/or researchers from the Communication Tower Working Group or their designees should be allowed access to the site after construction is complete to conduct both large (e.g., crane [Gruidae], swan, and goose [Anatidae]) and small dead-bird searches; to place net catchments below the tower but above ground; to position radar, Global Positioning System, infrared, thermal imagery, and acoustical monitoring equipment as necessary to assess and verify bird migrations and habitat use; and to gain information on the impacts of various tower sizes, configurations, and lighting regimes.

APPENDIX D

PROJECT LOCATION PHOTOGRAPHS

Photograph 1 – Northeast boundary of Project Site looking west.

Photograph 2 – Northwest boundary of Project Site looking south.