

**Office of
Energy Projects**

May 2017

Tennessee Gas Pipeline Company, LLC

Docket No. CP16-496-000

Lone Star Project

Environmental Assessment

Washington, DC 20426

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

OFFICE OF ENERGY PROJECTS

In Reply Refer To:
OEP/DG2E/Gas Branch 1
Tennessee Gas Pipeline Company, L.L.C.
Lone Star Project
Docket No. CP16-496-000

TO THE PARTY ADDRESSED:

The staff of the Federal Energy Regulatory Commission (FERC or Commission) has prepared an environmental assessment (EA) for the Lone Star Project, proposed by Tennessee Gas Pipeline Company, LLC (Tennessee) in the above-referenced docket. Tennessee requests authorization to construct and operate two new compressor stations in San Patricio and Jackson Counties, Texas.

The EA assesses the potential environmental effects of construction and operation of the Lone Star Project in accordance with the requirements of the National Environmental Policy Act. The FERC staff concludes that approval of the proposed project, with appropriate mitigating measures, would not constitute a major federal action significantly affecting the quality of the human environment.

The proposed Lone Star Project includes the following facilities:

- one new bi-directional enclosed Compressor Station 3A in San Patricio County, Texas, consisting of one 10,915 horsepower (hp) International Organization for Standardization (ISO) rated Solar Taurus 70 turbine/compressor unit and associated appurtenances; and
- one new bi-directional enclosed Compressor Station 11A in Jackson County, Texas, consisting of one 20,500-hp ISO rated Solar Titan 130 turbine/compressor unit and appurtenances.

The FERC staff mailed copies of the EA to federal, state, and local government representatives and agencies; elected officials; Native American tribes; potentially affected landowners and other interested individuals and groups, including commenters; newspapers and libraries in the project area; and parties to this proceeding. In addition, the EA is available for public viewing on the FERC's website (www.ferc.gov) using the eLibrary link. A limited number of copies of the EA are available for distribution and public inspection at:

Federal Energy Regulatory Commission
Public Reference Room
888 First Street NE, Room 2A
Washington, DC 20426
(202) 502-8371

Any person wishing to comment on the EA may do so. Your comments should focus on the potential environmental effects, reasonable alternatives, and measures to avoid or lessen environmental impacts. The more specific your comments, the more useful they will be. To ensure that the Commission has the opportunity to consider your comments prior to making its decision on this project, it is important that we receive your comments in Washington, DC on or before **June 26, 2017**.

For your convenience, there are three methods you can use to file your comments with the Commission. In all instances please reference the project docket number (CP16-496-000) with your submission. The Commission encourages electronic filing of comments and has expert staff available to assist you at 202-502-8258 or FercOnlineSupport@ferc.gov.

- (1) You can file your comments electronically using the [eComment](#) feature located on the Commission's website (www.ferc.gov) under the link to [Documents and Filings](#). This is an easy method for submitting brief, text-only comments on a project;
- (2) You can also file your comments electronically using the [eFiling](#) feature on the Commission's website (www.ferc.gov) under the link to [Documents and Filings](#). With eFiling, you can provide comments in a variety of formats by attaching them as a file with your submission. New eFiling users must first create an account by clicking on "[eRegister](#)." You must select the type of filing you are making. If you are filing a comment on a particular project, please select "Comment on a Filing"; or
- (3) You can file a paper copy of your comments by mailing them to the following address:

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, DC 20426

Any person seeking to become a party to the proceeding must file a motion to intervene pursuant to Rule 214 of the Commission's Rules of Practice and Procedures (18 CFR 385.214).¹ Only intervenors have the right to seek rehearing of the Commission's decision. The Commission grants affected landowners and others with environmental concerns intervenor status upon showing good cause by stating that they have a clear and direct interest in this proceeding which no other party can adequately represent. **Simply filing environmental comments will not give you intervenor status, but you do not need intervenor status to have your comments considered.**

Additional information about the project is available from the Commission's Office of External Affairs, at **(866) 208-FERC**, or on the FERC website (www.ferc.gov) using the eLibrary link. Click on the eLibrary link, click on "General Search," and enter the docket number excluding the last three digits in the Docket Number field (i.e., CP16-496). Be sure you have selected an appropriate date range. For assistance, please contact FERC Online Support at FercOnlineSupport@ferc.gov or toll free at (866) 208-3676, or for TTY, contact (202) 502-8659. The eLibrary link also provides access to the texts of formal documents issued by the Commission, such as orders, notices, and rulemakings.

In addition, the Commission offers a free service called eSubscription which allows you to keep track of all formal issuances and submittals in specific dockets. This can reduce the amount of time you spend researching proceedings by automatically providing you with notification of these filings, document summaries, and direct links to the documents. Go to www.ferc.gov/docs-filing/esubscription.asp.

¹ See the previous discussion on the methods for filing comments.

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TECHNICAL ACRONYMS AND ABBREVIATIONS

$\mu\text{g}/\text{m}^3$	micrograms per cubic meter
amsl	above mean sea level
API	American Petroleum Institute
BEG	Bureau of Economic Geology of the University of Texas
CAA	Clean Air Act
CCCP	Cheniere Corpus Christi Pipeline, LP
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
Cheniere	Cheniere Corpus Christi Liquefaction, LLC
CO	carbon monoxide
Commission	Federal Energy Regulatory Commission
CO ₂	carbon dioxide
CO _{2e}	carbon dioxide equivalent
CR	County Road
dBA	decibels on the A-weighted scale
DOT	Department of Transportation
EA	environmental assessment
ESA	Endangered Species Act
ECMP	Environmental Compliance Management Plan
EI	environmental inspector
EO	Executive Order
EPA	Environmental Protection Agency
F	Fahrenheit
FERC	Federal Energy Regulatory Commission
FIRM	Flood Insurance Rate Maps
g	gravity
GHG	greenhouse gas
GWP	global warming potential
HAP	hazardous air pollutant
hp	horsepower
HUC	Hydrologic Unit Code
ISO	International Organization for Standardization
km	kilometers
L _{eq}	24-hour equivalent sound level
L _{dn}	day-night sound level
MLRA	Major Land Resource Area
MBTU	million British thermal units

NAAQS	National Ambient Air Quality Standards
NCDC	National Climatic Data Center
NGA	Natural Gas Act
NEPA	National Environmental Policy Act
NNSR	Nonattainment New Source Review
NO ₂	nitrogen dioxide
NOI	Notice of Intent to Prepare an Environmental Assessment for the Proposed Lone Star Project and Request for Comments on Environmental Issues
NO _x	nitrogen oxides
NSA	noise sensitive area
NSPS	New Source Performance Standards
NSR	New Source Review
NWSRS	National Wild and Scenic Rivers System
OEP	Office of Energy Projects
Option 2	Compressor Station 11A Option 2
PBR	Permit by Rule
Plan	FERC's <i>Upland Erosion Control, Revegetation and Maintenance Plan</i>
PGA	peak ground acceleration
ppb	parts per billion
ppm	parts per million
Procedures	FERC's <i>Wetland and Waterbody Construction and Mitigation Procedures</i>
PSD	Prevention of Significant Deterioration
SH	State Highway
SHPO	State Historic Preservation Office
SIL	significant impact level
SO ₂	sulfur dioxide
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
Tennessee	Tennessee Gas Pipeline Company, LLC
TPWD	Texas Parks and Wildlife Department
tpy	tons per year
TXDOT	Texas Department of Transportation
USACE	U.S. Army Corps of Engineers
USCB	United States Census Bureau
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
VOC	volatile organic compounds

A. PROPOSED ACTION

The staff of the Federal Energy Regulatory Commission (Commission or FERC) has prepared this environmental assessment (EA) to assess the environmental impacts of the construction and operation of two new compressor stations proposed by Tennessee Gas Pipeline Company, LLC (Tennessee). We² prepared this EA in compliance with the requirements of the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations for implementing NEPA (Title 40 of the Code of Federal Regulations, Parts 1500-1508 [40 CFR 1500-1508]), and the Commission's implementing regulations.³

1. INTRODUCTION

On August 18, 2016, Tennessee filed an application with the Commission in Docket No. CP16-496-000 under section 7(c) of the Natural Gas Act (NGA)⁴ seeking a Certificate of Public Convenience and Necessity to construct and operate a new 10,915 horsepower (hp) compressor station in San Patricio County, Texas (Compressor Station 3A) and a new 20,500 hp compressor station in Jackson County, Texas (Compressor Station 11A) (see figures 1 through 3 for facility locations). The proposed facilities would be on Tennessee's 100 Line and are referred to as the Lone Star Project (Project).

FERC is the lead federal agency for the Project and for the preparation of this EA. Our principal purposes in preparing this EA are to:

- identify and assess potential impacts on the natural and human environment that could result from implementation of the proposed action;
- identify and recommend reasonable alternatives and specific mitigation measures, as necessary, to avoid or minimize Project-related environmental impacts; and
- facilitate public involvement in the environmental review process.

The EA is an integral part of the Commission's decision-making process in determining whether to authorize Tennessee's proposal.

2. PROJECT PURPOSE AND NEED

Under section 7(c) of the NGA, the Commission determines whether interstate natural gas transportation facilities are in the public convenience and necessity and, if so, grants a Certificate to construct and operate them. The Commission bases its decisions

² "We," "us," and "our" refer to the environmental staff of the Commission's Office of Energy Projects.

³ See [18 CFR 380](#).

⁴ See Natural Gas Code [15 of the U.S. Code, Chapter 15B](#).

on technical competence, financing, rates, market demand, gas supply, environmental impact, long-term feasibility, and other issues concerning a proposed project.

Tennessee's stated Project purpose is to provide firm transportation service to the Corpus Christi Liquefaction, LLC facility in San Patricio County, Texas through the Cheniere Corpus Christi Pipeline, L.P. (Cheniere). The Cheniere project was certificated in docket number CP12-508-000. Additionally, Tennessee's Project would create an incremental 300 million cubic feet per day of capacity from its existing Compressor Station 17 in Wharton County, Texas, to the delivery point of interconnection with Cheniere. The incremental 300 million cubic feet per day of capacity created by the Project will be coupled with an existing 300 million cubic feet of unsubscribed capacity from Tennessee's existing Heidelberg receipt point to Compressor Station 17 to provide the requested transportation path to Cheniere.

2. SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

The topics addressed in this EA include geology, soils, groundwater, surface waters, wetlands, fisheries, wildlife, vegetation, species of special concern, land use, recreation, visual impacts, socioeconomics, cultural resources, air quality, noise, reliability and safety, cumulative impacts, and alternatives. This EA describes the affected environment as it currently exists and the environmental consequences of the Project, and compares the Project's potential impact with that of various alternatives. This EA also presents our recommended mitigation measures.

As the lead federal agency for the Project, FERC is required to comply with section 7 of the Endangered Species Act, as amended (ESA) and section 106 of the National Historic Preservation Act. These statutes have been considered in the preparation of this EA. In addition to FERC, other federal, state, and local agencies may use this EA in approving or issuing permits for all or part of the proposed Project. Permits, approvals, and consultations for the Project are discussed in section A.10 of this EA.

2. PROPOSED FACILITIES

Compressor Station 3A in San Patricio County, Texas would consist of one new bi-directional enclosed compressor station, which includes one 10,915 hp International Organization for Standardization (ISO) rated Solar Taurus 70 turbine/compressor unit.

Compressor Station 11A in Jackson County, Texas would consist of one new bi-directional enclosed compressor station, which includes one 20,500 hp ISO rated Solar Titan 130 turbine/compressor unit.

Facilities that would be constructed at both Compressor Stations 3A and 11A include:

- mainline valves upstream and downstream of 100-1 and 100-2 Lines;
- auxiliary equipment, including a double-walled liquid storage tank, filter separators, gas discharge cooler, engine exhaust and silencer system, air inlet system, lube oil cooler system, cathodic protection equipment, earth grounding protection equipment, emergency shutdown and unit blowdown system with silencer, uninterruptable power supply, and gas piping, valves, and associated components;
- auxiliary building, including an emergency generator, air compressors, water heater system, and a gas-fired heater;
- septic system and associated leach field, water well and water line, power feed and transformer, phone and Supervisory Control and Data Acquisition system, yard lighting; and
- access roads, parking areas, security system, and fence.

See appendix A for additional Project figures.

Figure 1 Project Description Map

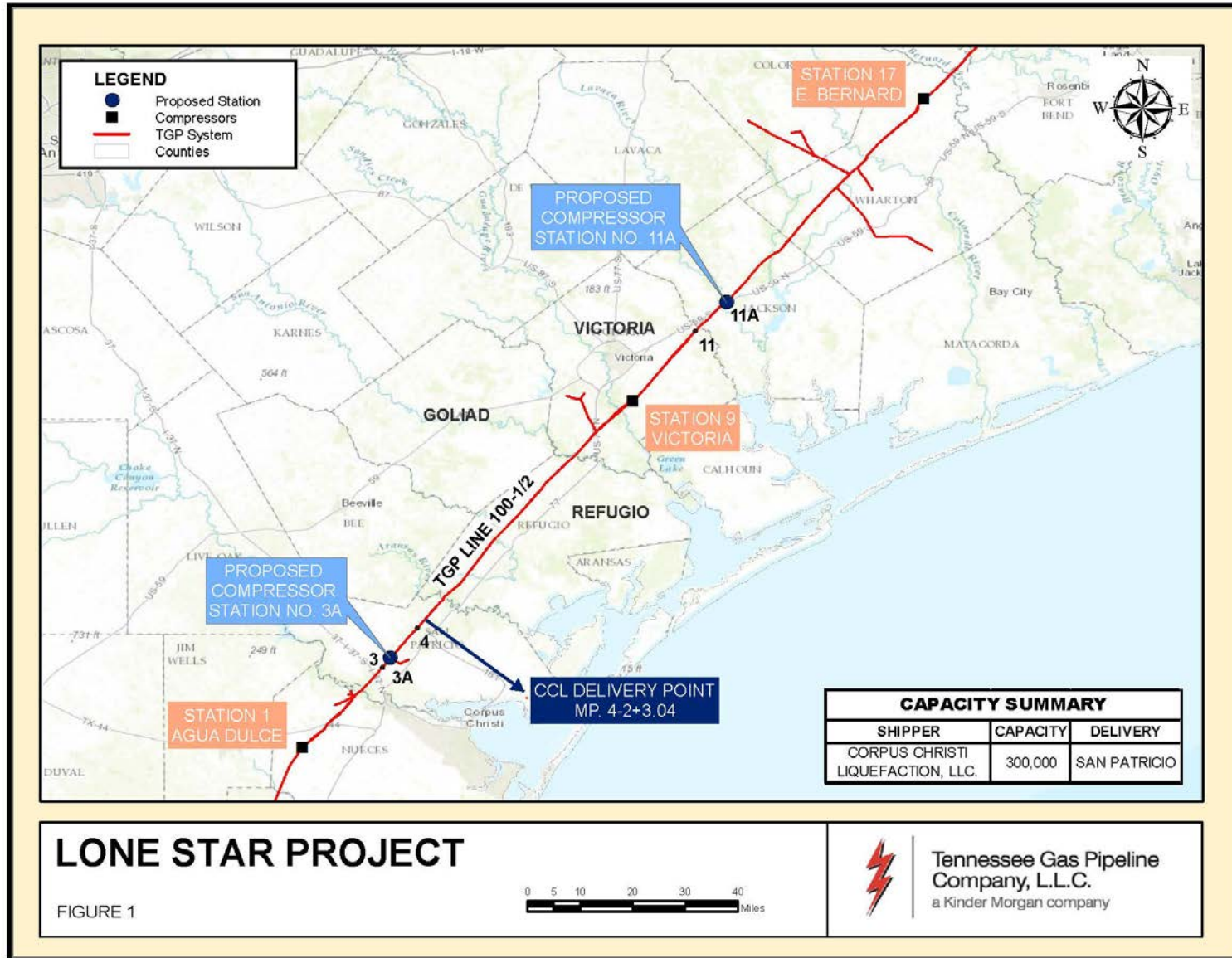
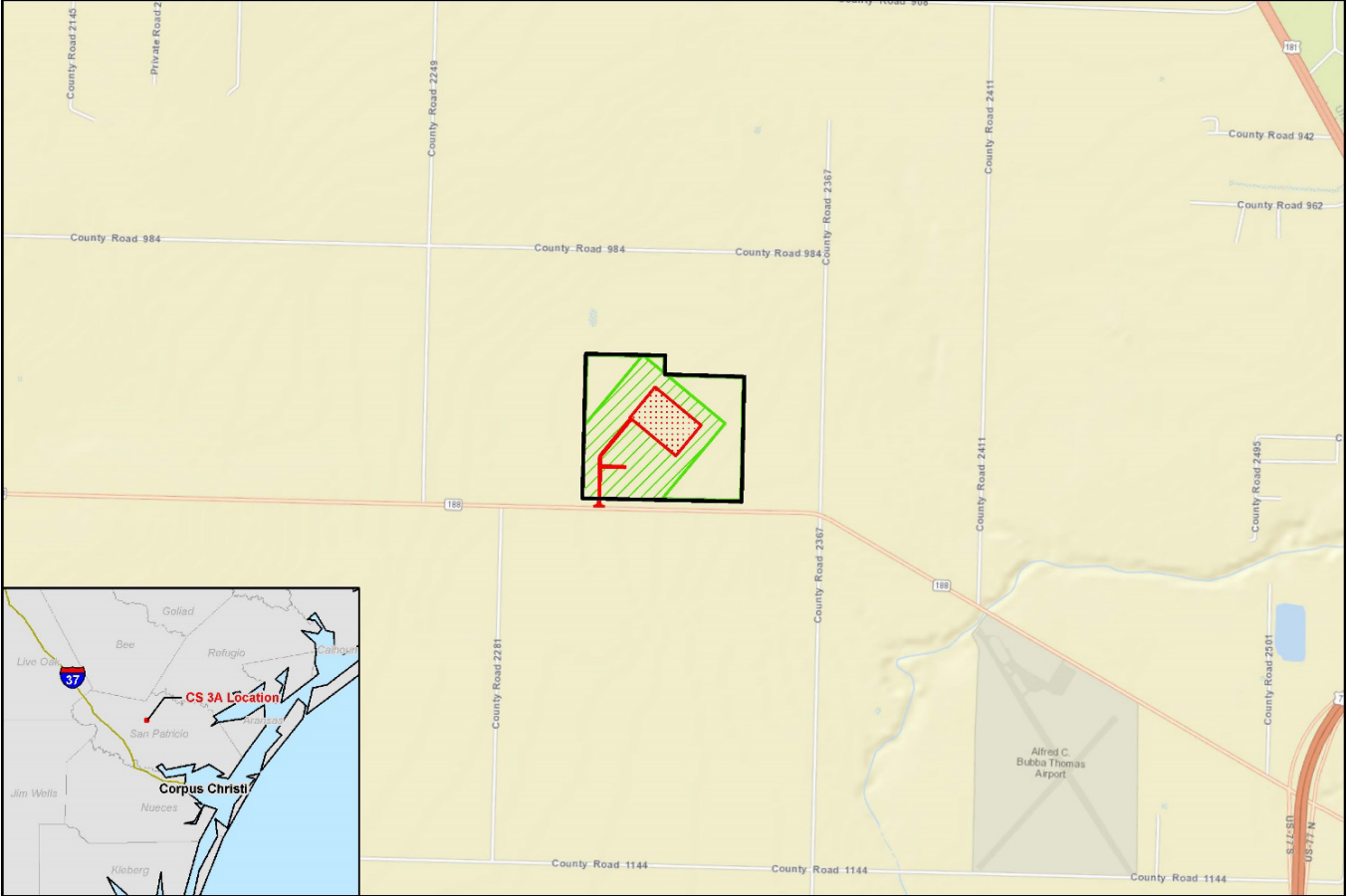


Figure 2 Compressor Station 3A Location Map



FILE: S:\Projects\14101_LoneStar_TGSPipeline\SWCA\GIS\MapDocs\14101_CS_3A_Paved_Location_Map.mxd


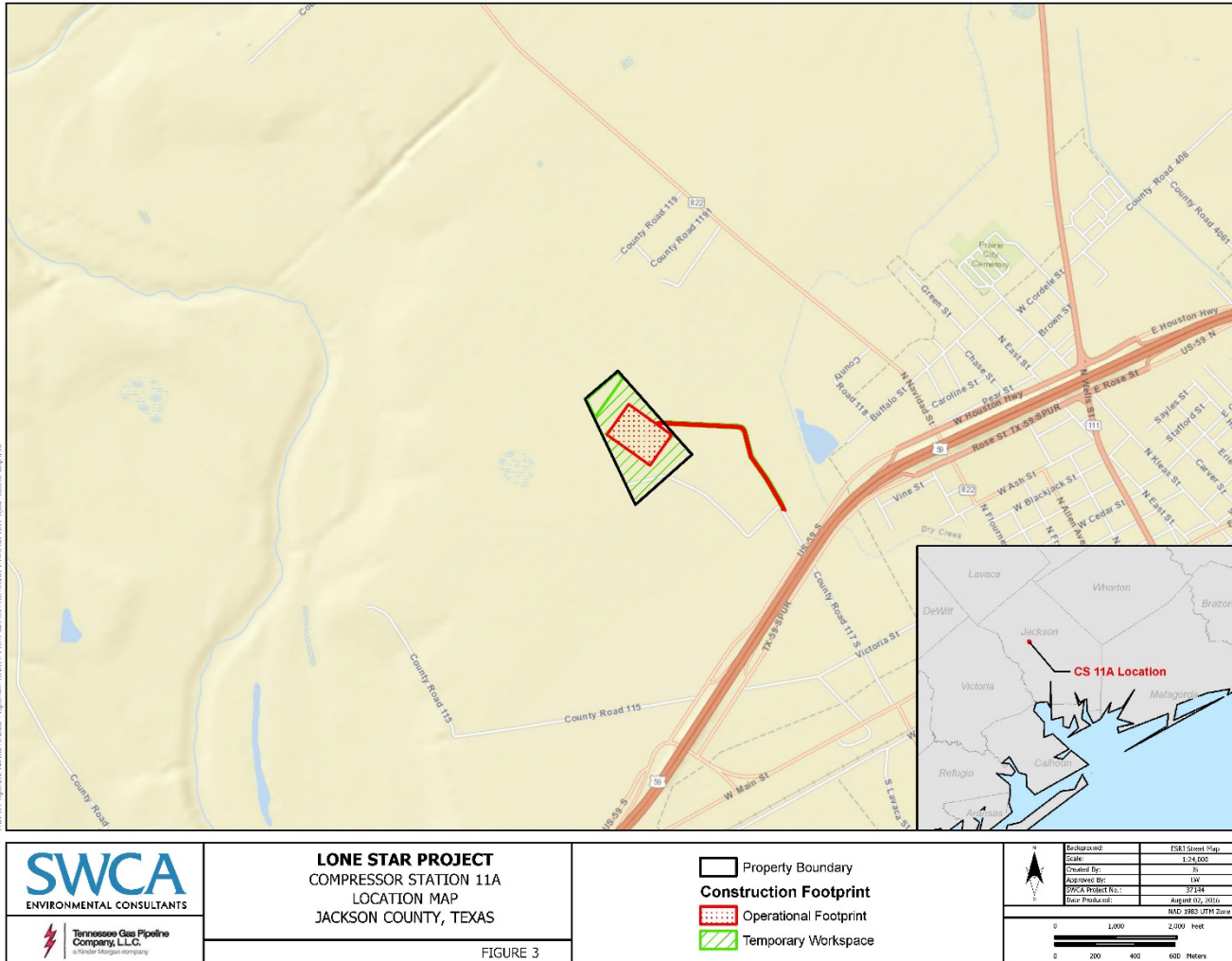
 SWCA ENVIRONMENTAL CONSULTANTS	LONE STAR PROJECT COMPRESSOR STATION 3A LOCATION MAP SAN PATRICIO COUNTY, TEXAS	<table border="0"> <tr> <td style="border: 1px solid black; width: 15px; height: 10px; display: inline-block;"></td> <td>Property Boundary</td> </tr> <tr> <td style="border: 1px solid red; width: 15px; height: 10px; display: inline-block;"></td> <td>Operational Footprint</td> </tr> <tr> <td style="border: 1px solid green; width: 15px; height: 10px; display: inline-block;"></td> <td>Temporary Workspace</td> </tr> </table>		Property Boundary		Operational Footprint		Temporary Workspace	<table border="1" style="font-size: 8px;"> <tr> <td>Background:</td> <td>ESRI Street Map</td> </tr> <tr> <td>Scale:</td> <td>1:24,000</td> </tr> <tr> <td>Created By:</td> <td>RS</td> </tr> <tr> <td>Approved by:</td> <td>HW</td> </tr> <tr> <td>SWCA Project No.:</td> <td>17141</td> </tr> <tr> <td>Date Produced:</td> <td>August 02, 2015</td> </tr> </table> <div style="text-align: center; margin-top: 5px;">    </div>	Background:	ESRI Street Map	Scale:	1:24,000	Created By:	RS	Approved by:	HW	SWCA Project No.:	17141	Date Produced:	August 02, 2015
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Approved by:	HW																				
SWCA Project No.:	17141																				
Date Produced:	August 02, 2015																				
 Tennessee Gas Pipeline Company, L.L.C. <small>a wholly owned subsidiary of</small>		FIGURE 2																			

Figure 3 Compressor Station 11A Location Map



1. CONSTRUCTION AND OPERATION PROCEDURES

The proposed facilities would be designed, constructed, tested, operated, and maintained to conform with or exceed federal, state, and local requirements, including the US Department of Transportation's (DOT) Minimum Safety Standards in 49 CFR 192, *Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards*, and 18 CFR 380.15, *Siting and Maintenance Requirements*.

During construction and restoration of the Project, Tennessee would implement the measures contained in its Environmental Compliance Management Plan (ECMP), in addition to other federal, state, and local permit requirements. Tennessee's ECMP contains the following plans:

- FERC's Upland Erosion Control, Revegetation, and Maintenance Plan (Plan);⁵
- FERC's Wetland and Waterbody Construction and Mitigation Procedures (Procedures);⁶
- Environmental Control Standards;
- Spill Prevention and Control Plan (SPCP); and
- Unanticipated Discovery Plan for Cultural Resources and Human Remains.

Our Plan and Procedures are baseline construction and mitigation measures to minimize the potential environmental impacts of construction on upland areas, wetlands, and waterbodies. Tennessee would assign an individual to perform the duties of Environmental Inspector (EI) to oversee and document environmental compliance and prepare FERC reports during the construction phase. All Project-related construction personnel would be informed of the EI's authority and would receive job-appropriate environmental training prior to commencement of work on the Project. Depending on the progress of the construction, additional EIs may be added as necessary. FERC staff would also conduct routine inspections during construction to determine compliance with any conditions attached to an Order and to inspect the construction conditions of the Project facilities.

Prior to commencement of any construction-related activities, survey crews would stake the limits of the construction work areas and access roads. Tennessee would avoid sensitive areas by flagging or fencing the resource, as appropriate. Tennessee would contact the national "one-call" system to identify and mark buried utility lines prior to ground disturbance. Construction work areas would be cleared of existing vegetation and graded, as necessary, to create level surfaces for the movement of construction vehicles

⁵ The FERC Plan can be viewed on the FERC website <http://www.ferc.gov/industries/gas/enviro/plan.pdf>.

⁶ The FERC Procedures can be viewed on the FERC website <https://www.ferc.gov/industries/gas/enviro/procedures.pdf>.

and to prepare the area for the building foundations. In accordance with the ECMP, temporary erosion and sediment control measures would be installed following initial ground disturbance.

Tennessee would excavate the sites, as necessary, to accommodate the reinforced concrete foundation that is required for the new compressor units and buildings. The foundation and piling/pier excavation depths would be determined upon completion of the geotechnical evaluations. After the concrete foundations have been completed and tested to verify minimum strength requirements, installation of the buildings and machinery would begin. The steel frames would be erected, followed by installation of the roofs, interior siding, insulation, and exterior siding. The turbines/compressors would then be positioned on the foundations, leveled, grouted, and secured.

Pipe connections associated with the new compressors and equipment would be flanged, screwed, or welded. Tennessee would test the piping system welds by a non-destructive method to ensure compliance with 49 CFR 192.

In accordance with the ECMP, Tennessee would grade the disturbed temporary work areas to match pre-construction contours and drainage patterns, and reseed the areas within six working days of final grading. Tennessee would leave temporary erosion control measures in place or replace them with interim erosion control measures until sufficient vegetative cover has re-established. Permanent workspaces would be graveled or paved with asphalt. Following construction, Tennessee would install a security fence and property fences around the permanent operational compressor station facilities.

1. CONSTRUCTION SCHEDULE

Tennessee plans to obtain all necessary permits to begin construction by January 2018. Based upon the anticipated schedule, construction would last approximately 10 months at both Compressor Stations 3A and 11A, with construction at both stations occurring concurrently. Tennessee anticipates placing the facilities into service by January 1, 2019.

1. LAND REQUIREMENTS

Compressor Station 3A would be on a 111.8-acre parcel of land. Construction of Compressor Station 3A would disturb approximately 72.2 acres of land, of which 13.4 acres of land would be permanently maintained for operation of the facility, including the new access road. Approximately 12.5 acres of the permanently-maintained land would be fenced in. The remaining land would not be disturbed. Tennessee has acquired the entire 111.8 parcel.

Compressor Station 11A would be on a 49.8-acre parcel of land. Construction of Compressor Station 11A would disturb approximately 41.1 acres, of which Tennessee

would maintain 14.0 acres for operation of the facility, including the new access road. Approximately 12.2 acres of the permanently maintained land would be fenced in. The remaining land would not be disturbed. Tennessee has acquired the 49.8 acre parcel. Table 1 below summarizes the land requirements for the Project.

Table 1			
Land Requirements for the Proposed Project			
Facility	Location	Total Temporary Impact (acres)	Permanent/Operational Impact (acres)
CS 3A	San Patricio County, Texas	72.2	13.4
CS 11A	Jackson County, Texas	41.1	14
Total		113.3	27.4

Although Tennessee has identified areas where workspace would be required, additional or alternative areas could be identified in the future due to changes in site-specific construction requirements. Tennessee would be required to file information on each of those areas for review and approval prior to use.

1. NON-JURISDICTIONAL FACILITIES

Under Section 7 of the NGA, the Commission is required to consider, as part of the decision to approve facilities under its jurisdiction, all factors bearing on the public convenience and necessity. Occasionally, proposed projects have associated facilities that do not come under the jurisdiction of the Commission. These “non-jurisdictional” facilities may be integral to the need for the proposed facilities, such as a power plant at the end of a jurisdictional pipeline, or they may be minor, non-integral components of the facilities under the Commission’s jurisdiction.

Both compressor stations would require the installation of an electric powerline and telephone line. Approximately 1,500 feet of new 12.47 kilovolt overhead distribution powerline and 1,500 feet of overhead telephone line would be installed from existing facilities to Compressor Station 3A and would be adjacent to the new access road. Tennessee anticipates that the electric powerline and telephone line would be installed on the same poles and within the proposed workspace adjacent to the proposed access road.

Approximately 2,750 feet of new 12.47 kilovolt overhead powerline would be constructed from existing power facilities to Compressor Station 11A, adjacent to the new access road from North Brazos Street. Tennessee anticipates that the electric

powerline and telephone line would be installed on the same poles and within the proposed workspace adjacent to the proposed access road.

The local power and telephone provider would construct, own, and operate the lines from the road to the electric meters for Compressor Stations 3A and 11A. The local utility company would acquire any necessary federal, state, or local permits for the installation of these non-jurisdictional facilities. Because the proposed locations of the powerlines/phone lines are within the footprint of the proposed Project access roads, no additional impacts on resources are expected. Therefore, the impacts from these projects are accounted for in the environmental analysis presented in section B of this EA.

2. PUBLIC REVIEW AND COMMENT

On October 12, 2016, the Commission issued a *Notice of Intent to Prepare an Environmental Assessment for the Proposed Lone Star Project and Request for Comments on Environmental Issues* (NOI). The NOI was sent to affected landowners; federal, state, and local government agencies; elected officials; environmental and public interest groups; Native American tribes; other interested parties; and local libraries and newspapers. On October 31, 2016 an Errata Notice to the NOI was issued to correctly identify the horsepower rating of Compressor Station 11A.

In response to the NOI, the Commission received comments from a number of local residents. Based on public interest, we issued a *Notice of Public Scoping Session for the Proposed Lone Star Project and Request for Comments on Environmental Issues* and extended the scoping period until December 21, 2016. The scoping session was held on December 13, 2016 in Edna, Texas to provide an opportunity for agencies and the general public to learn about the Project and participate in the environmental analysis by identifying issues to be addressed in the EA

In response to the notices and public scoping session, we received 21 comments from the public and 108 signatories on a letter in protest of the Project. We also received a letter from the U.S. Environmental Protection Agency (EPA). The transcripts of the public scoping session and all the written comments are part of the public record for the Project and are available for viewing on the FERC website.⁷

The primary issues raised by the EPA and commenters were site location and alternative site locations, air quality and noise impacts, nighttime lighting, impacts on water resources, industrialization and impacts on property values, and pipeline safety. Table 2 provides a general listing of topics raised by the public and where they are addressed in the document.

⁷ Go to www.ferc.gov and using the “eLibrary” link, select “General Search” from the menu and enter the docket number in the “Docket Number” field (i.e., CP16-496) and select an appropriate date range.

Table 2 Issues Identified During Scoping	
Issue	EA Section Addressing Issue
Water Resources	
Impacts on potable water wells	B.3
Impacts on surface water from stormwater runoff, spills, and hydrostatic test water discharge	B.3
Wildlife and Vegetation	
Impacts on local wildlife and birds	B.4
Invasive species and impacts on local vegetation	B.4.1
Land Use and Visual Resources	
Impacts on visual environment	B.5
Impacts on existing land use (including fencing) and industrialization	B.5
Impacts of night lighting and glare	B.5.9
Socioeconomics	
Impacts on property values	B.6.5
Environmental justice	B.6.6
Air Quality	
Impacts on human health and sensitive populations (i.e., children)	B.8.5; B.11.2
Noise and Vibration	
Impacts of vibration on water wells	B.9.5
Impacts of noise on general environment during construction and operation	B.9.3; B.9.4
Safety	
Pipeline safety and integrity	B.10
Risk of accidents	B.10
Alternatives	
Alternative locations east of Highway 111 and away from residential areas	C.3
Alternative locations southwest of the current location	C.3

10. PERMITS

Appendix B provides a list of known federal, state, and local permits for the Project, as well as any responses that have been received to date. Tennessee would be responsible for obtaining all permits and approvals required for the Project, regardless of their listing in appendix B.

B. ENVIRONMENTAL ANALYSIS

The following sections discuss the Project's potential direct and indirect impacts on environmental resources. When considering the environmental consequences of the proposed Project, the duration and significance of any potential impacts are described below according to the following four levels: temporary, short-term, long-term, and permanent. Temporary impacts generally occur during construction, with the resources returning to pre-construction conditions almost immediately. Short-term impacts could continue for up to three years following construction. Long-term impacts would require more than three years to recover, but eventually would recover to pre-construction conditions. Permanent impacts could occur because of activities that modify resources to the extent that they may not return to pre-construction conditions during the life of the Project, such as with the construction of an aboveground facility. An impact would be considered significant if it would result in a substantial adverse change in the physical environment.

1. GEOLOGY

1.1 PHYSIOGRAPHIC SETTING AND GEOLOGIC CONDITIONS

The Project is in San Patricio and Jackson Counties, Texas and lies within the Coastal Prairie Subsection of the West Gulf Coastal Plain of Texas. The Coastal Prairie of Texas is nearly flat, sloping gently to the southeast towards the coastline, underlain by young deltaic sand, silt, and clay. The Beaumont Formation (clay and sand unit) underlie the Project compressor stations (Bureau of Economic Geology of the University of Texas [BEG] 1996). The clay unit consists of Middle to Late Pleistocene unconsolidated, fine-detrital, dark gray and bluish to greenish gray silt and clay that were deposited in flood basins, coastal lakes, and former stream channels on the deltaic plain. The sand unit consists of Late Pleistocene unconsolidated, coarse-detrital, yellowish to brownish gray, locally reddish orange, fine quartz sand, silt, and minor fine gravel fluvial deposits, including stream channel, point-bar, crevasse-splay, and levee ridge deposits, as well as marine delta-front sand, lagoonal clay, and near-shore marine sand deposits (BEG 1996).

There is no noticeable topographic relief at either compressor station site. Land surface elevations range between 50 and 55 feet above mean sea level (amsl) at Compressor Station 3A and 68 to 71 feet amsl at Compressor Station 11A. Maximum land surface slopes are less than 0.2 percent at Compressor Station 3A and 0.3 percent at Compressor Station 11A. As such, landslide and/or unstable slope hazards do not exist in the Project areas.

10. MINERAL RESOURCES

Project construction and operation impacts on mineral and non-mineral resources are not anticipated. No mineral or non-mineral resources, mines, sand/gravel pits, borrow

pits, or quarries were identified in the vicinity of the Compressor Station 3A or Compressor Station 11A property. The nearest mapped resources are a sand-and-gravel pit located about 10 miles west of the Compressor Station 3A property, and several sand-and-gravel pits located just west of Victoria, Texas, approximately 25 miles west of the Compressor Station 11A property (United States Geological Survey [USGS] 2003).

There are no oil and gas wells within the Compressor Station 3A or the Compressor Station 11A property. Two wells are within 0.25 mile of the Compressor Station 3A property, including one dry hole and one permitted well location (American Petroleum Institute Nos. 409 and 40932993, respectively). Permit records show that the permitted well, located about 530 feet east of Compressor Station 3A, was permitted in February 2013 for a new drill vertical well bore to a depth of 8,000 feet. There are no oil and gas wells within 0.25 mile of the Compressor Station 11A property.

10. GEOLOGIC HAZARDS

Seismicity and Liquefaction

The American Society of Civil Engineers Technology Council on Lifeline Earthquake Engineering defines the 2-percent probability of exceedance in 50 years (2,500-year return period) and the 10-percent probability in 50 years (475-year return period) as the contingency design for aboveground facilities and buried pipelines, respectively. The USGS rates peak ground acceleration (“PGA”) and probabilities as part of its Earthquake Hazards Program. PGA is the maximum acceleration experienced during the course of an earthquake motion and is measured in units of acceleration due to gravity (“g”). The PGA rating in the south Texas region, including the Compressor Station 3A and Compressor Station 11A sites, is between 0.02 and 0.04 g with a 2-percent probability of exceedance in 50 years, and between 0.00 and 0.01 g with a 10-percent probability of exceedance in 50 years.⁸ PGAs of 0 to 4 percent g have weak to light/moderate perceived ground shaking with no to little resulting damage. The USGS Earthquake Probability Mapping tool maps the probability of an earthquake exceeding magnitude 5.0 within 50 kilometers (km) of Compressor Station 3A and Compressor Station 11A, and within 50 years, as less than 1 percent.

The USGS has recently compiled data to identify and determine the potential hazard of induced earthquakes, which are those that result from human activity, most commonly the disposal of wastewater through its injection into deep geologic formations by way of underground injection wells. The USGS updated study resulted in a forecast for damage from natural and induced earthquakes for the 2017 1-year period. The likelihood of damage from an earthquake in the south Texas area, including the

⁸ <https://earthquake.usgs.gov/hazards/hazmaps/conterminous/index.php#2014>

Compressor Station 3A and Compressor Station 11A sites, for 2017 is less than 1 percent.⁹

Given the low seismic potential at either the Compressor Station 3A or 11A sites, the potential for soil liquefaction is considered to be low.

Quaternary-Age Faults

A belt of mostly seaward-facing normal faults borders the northern Gulf of Mexico in westernmost Florida, southwestern Alabama, southern Mississippi, all of Louisiana and southernmost Arkansas, and eastern and southern Texas, including San Patricio and Jackson Counties.¹⁰ These gulf-margin normal faults are believed to be the result of post-depositional subsidence, however some of the sparse seismicity in the normal-fault belt may be artificially induced due to human activity such as deep wastewater disposal practices. The only damaging earthquakes reported through 1989 in this area are four Modified Mercalli Intensity VI earthquakes in westernmost Florida (1780), southern Louisiana (1930), and eastern Texas (1891, 1932). The gulf-margin normal faults in Texas have low seismicity and may be decoupled from the underlying bedrock, making it unclear if they can generate significant seismic ruptures that could cause damaging ground motion. As such, the USGS has designated these faults as Class B structures by the USGS.¹¹ Given the low seismic potential of these Class B faults, the potential for impact to the planned Project facilities is likewise considered to be low.

Ground Subsidence

Compressor Station 3A and Compressor Station 11A sites are not in areas mapped as having karst or potential karst features. However, land subsidence has been documented throughout the Texas coastal region, due to fluid (groundwater, oil, and gas) extraction. In general, land subsidence across most of the coastal area of Texas has been less than 0.5 foot, although in places such as the Houston-Galveston area, subsidence has been as much as 10 feet locally and has created problems with flooding in a high-population area (Ratzlaff 1980; Galloway et al. 1999).

It is reasonable to presume that the land on which Compressor Station 3A and Compressor Station 11A sites are proposed has subsided slightly since the onset of groundwater withdrawal in the early part of the twentieth century (Ratzlaff 1980; Galloway et al. 1999). However, Compressor Station 3A and Compressor Station 11A sites are not in the areas of known anomalous subsidence, nor are the construction and operation activities at these locations, such as intensive use of groundwater for irrigation or oil and gas extraction activities, in amounts enough to generate conditions favorable

⁹ <https://www.usgs.gov/news/new-usgs-maps-identify-potential-ground-shaking-hazards-2017>

¹⁰ <https://earthquake.usgs.gov/hazards/qfaults/map/#qfaults>

¹¹ https://earthquake.usgs.gov/cfusion/qfault/show_report_AB_archive.cfm?fault_id=924§ion_id=

for subsidence. As such, mitigation for future land subsidence is not considered necessary.

In conclusion, construction and operation of the Project compressor stations would not result in any significant impacts on geologic resources in the Project area, nor do we anticipate any impacts on the Project from geologic hazards.

2. SOILS

Compressor Stations 3A and 11A are both within Major Land Resource Area (MLRA) 150A – Gulf Coast Prairies, part of Land Resource Region T – Atlantic and Gulf Coast Lowland Forest and Crop Region (Natural Resources Conservation Service 2016). The dominant soil orders in MLRA 150A include Alfisols, Mollisols, and Vertisols derived from parent material consisting of sedimentary rocks of Pleistocene age with deposits of deltaic and lagoonal clays. The major land use for MLRA 150A is private grassland and cropland, and the major soil resource concerns are wind and water erosion, maintenance of the content of organic matter, cultivation/tillage, and management of soil moisture.

10. PRIME FARMLAND

Farmland classifications identify soil map units as prime farmland and farmland of statewide importance. Soils classified as prime farmland are those that have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses.¹² Farmland of statewide importance is land that produces high yields of crops when treated and managed according to acceptable farming methods.¹³

Construction of Compressor Station 3A would result in approximately 50.4 acres of impacts on soils classified as prime farmland and 14.6 acres of impacts on soils classified as farmland of statewide importance. The parcel of land to be fenced by Tennessee for permanent operation of Compressor Station 3A includes 12.8 acres of soils classified as prime farmland and 0.3 acres of farmland of statewide importance that would be precluded from future farming and agricultural production.

Construction of Compressor Station 11A would result in approximately 35.1 acres of impacts on soils classified as prime farmland and 6.0 acres of impacts on soils classified as farmland of statewide importance. Of those totals, approximately 14.0 acres would be permanently disturbed for compressor station operations. The parcel of land to be fenced by Tennessee for Compressor Station 11A includes 12.9 acres of soils

¹² 7 C.F.R. § 657.5(a)

¹³ 7 C.F.R. § 657.5(c)

classified as prime farmland and 1.1 acres of soils classified as farmland of statewide importance that would be precluded from future farming and agricultural production.

Based on the relatively small acreages of land required for permanent operation of the Project, we conclude that no significant impacts would occur from conversion of prime farmland and farmland of statewide importance to industrial use.

2.2 CONTAMINATED SOILS

Tennessee conducted Phase I Environmental Site Assessments for both compressor station sites which did not identify signs of contaminated soils or recognized environmental conditions at either of the Compressor Station 3A and/or 11A sites. Therefore, we conclude no impacts would occur from contaminated soils.

2.2 EXPANSIVE SOILS

Soil expansion occurs when soils consisting primarily of clay and silt expand as a result of increased moisture content, and shrink upon drying. Expansion and shrinking of soils due to moisture fluctuations can cause damage to concrete slabs, foundations, and other confining structures. Expansive soils are sometimes referred to as shrink-swell soils and are common in east and southeast Texas.

The U.S. Department of Agriculture Web Soil Survey identified all of the soil mapping units within the Compressor Station 3A site to be shrink-swell soils, with one soil map unit, the Banquete clay, rated as having “very limited” use for the construction of buildings on reinforced concrete slabs due to high shrink-swell reasons. The rating is reduced to “somewhat limited” use for the construction of pier-beam building foundations. The Banquete clay comprises about 20 acres of the Compressor Station 3A site.

The U.S. Department of Agriculture Web Soil Survey also identified all of the soil mapping units within the Compressor Station 11A site to be shrink-swell soils, with two soil map units, the Laewest clay and the Telferner fine sandy loam, rated as having “very limited” use for the construction of buildings on reinforced concrete slabs due to high shrink-swell reasons and also for shallow depth to water saturation in the case of the Telferner fine sandy loam. The rating is reduced to “somewhat limited” use for the construction of pier-beam building foundations in the case of the Laewest clay, but remains “very limited” for the Telferner fine sandy loam because of the depth to water saturation. The Laewest clay comprises about 9.9 acres of the Compressor Station 11A site, and the Telferner fine sandy loam comprises about 3.3 acres. Based on the results of geotechnical studies, Tennessee has proposed mitigation measures to address shrink-swell soils, outlined in the section below.

2.2 SOIL IMPACTS

Construction activities, such as clearing, grading, and excavation, as well as the movement of construction equipment, could result in temporary impacts on soil resources. Impacts on soils from construction activities would be minimized by implementation of applicable best management practices from Tennessee's Project ECMP as well as our Plan and Procedures. Typical measures include:

- minimizing the extent and duration of soil disturbance and exposure;
- protecting sensitive resource areas by reducing the velocity of sheet flow and redirecting runoff;
- installing and maintaining temporary erosion and sediment control measures (e.g., sediment barriers, mulch);
- applying water to disturbed areas (as needed) to minimize wind erosion; and
- revegetating and stabilizing disturbed work areas following construction.

Tennessee performed geotechnical investigations for both Compressor Stations 3A and 11A, and provided geotechnical reports which included the results of test borings, as well as recommended construction practices. Compressor Station 3A soils were found to have a free-swell rating of 50 percent at depths between 3 and 5 feet, with a medium degree of expansion. Based on the laboratory test data, the site soils have a low potential to shrink and swell with changes in moisture content. Compressor Station 11A soils were found to have a free-swell rating of 80 percent at depths between 3 and 5 feet, with a medium degree of expansion. Based on the laboratory test data, site soils have a medium potential to shrink and swell with changes in moisture content.

Tennessee states that no special mitigation measures are proposed for structural protection against soil expansion at Compressor Stations 3A and 11A because the geotechnical investigations reveal a low potential for soil expansion at Compressor Station 3A and a medium potential for soil expansion at Compressor Station 11A. However, Tennessee has committed to implementing the following soil shrink swell mitigation measures for Project soils:

1) Slab-on-Grade Foundations:

The edges of the slabs-on-grade would be thickened to extend at least 2 feet below lowest adjacent grade. The thickened edge would provide resistance to shallow soil moisture content changes below the slab bearing elevation. The exposed soils should be protected from drying and saturation prior to placing the concrete.

2) Spread Footings:

Soft or wet soils or unsuitable materials encountered at footing bearing depth would be over-excavated. Replacement could be required in these areas using a flowable fill or structural backfill.

Based on Tennessee's implementation of its Project ECMP, which includes our Plan and Procedures, and its mitigation measures for shrink-swell soils, we conclude that there would be no significant impacts on project soils or to construction of facilities in areas of expansive soils.

2. WATER RESOURCES

Based on the available information from the U.S. Geological Survey, U.S. Army Corps of Engineers (USACE), National Oceanographic and Atmospheric Administration Fisheries, U.S. Fish and Wildlife Service (USFWS) correspondence with state and federal agencies, and our review, we have determined that the Project would not affect:

- state-designated special use waters (outstanding state resource waters, high quality waters, or sensitive public and private water supply waters);
- federal or state-designated wild and scenic rivers;
- USACE River and Harbors Act of 1899 Section 10 Navigable Waters;
- public water supply surface water intakes;
- source water protection areas (Texas Commission on Environmental Quality [TCEQ] 2016);
- contaminated waterbodies;
- springs or seeps; and
- coastal zone management areas.

2.2 GROUNDWATER

The Project is within the Aransas (Hydrologic Unit Code [HUC] 12100407) and Lavaca (HUC 12100101) sub-basin watersheds (EPAg 2016). The EPA identified high levels of bacteria as a water quality impairment within the Aransas sub-basin, which is about 857.5 square miles, and low levels of dissolved oxygen and high levels of bacteria as water quality impairments within the Lavaca sub-basin, which is about 909.9 square miles.

Two private water supply wells were identified within the Compressor Station 3A property; one well is used for livestock watering purposes and the other is used for potable water. Tennessee would use one onsite well at Compressor Station 3A to supply water for dust suppression (approximately 806,400 gallons) and hydrostatic testing (approximately 120,000 gallons) during construction, and for potable use during operation.

No groundwater wells were identified within 150 feet of the proposed Compressor Station 11A property during field surveys or desktop analysis. Tennessee would acquire water for dust suppression (approximately 806,400 gallons) and hydrostatic testing (approximately 120,000 gallons) from a metered tap managed by the Public Works Department for the City of Edna, Texas. Tennessee would drill a new water well within the Compressor Station 11A parcel to supply potable water for use during operation.

At Compressor Station 3A, Tennessee would implement measures outlined in the SPCP to mitigate potential impacts to groundwater, including maintaining a 200-foot setback from private water wells for hazardous materials storage, and equipment, vehicle maintenance, and refueling activities. Tennessee would receive water well production permits from the local water service agency prior to construction. Aside from water truck refilling activities, Tennessee anticipates that no construction activities would occur within the 200-foot setback of the water wells; therefore, there is no potential for contamination of water wells during construction of the Project. Based on the mitigation measures proposed by Tennessee, we conclude that no impacts on groundwater or water wells would occur as a result of the Project.

2.2 SURFACE WATERS

The Project would have minor impacts on surface water within the Project area during construction. The Project would cross one concrete-lined minor ephemeral waterbody drainage canal at each of the two Project sites. An existing driveway with a pre-cast bridge crosses a drainage canal at the Compressor Station 3A site. Tennessee would replace this existing driveway and pre-cast bridge with a new 20-foot-wide permanent access road with a box-style culvert underneath the new road to maintain drainage. The construction of this replacement bridge would have a negligible impact on the canal (about 0.001 acre of both temporary construction and permanent impacts).

An existing access road overlying a culvert crosses the other drainage canal at the Compressor Station 11A property. Tennessee has proposed a 50-foot-wide temporary access road at this location, and would maintain a 25-foot-wide permanent access road for station operations. Tennessee would replace the existing culvert to accommodate the new access road. Construction of this replacement access road and culvert would also have negligible impact on the canal (0.012-acre of construction impacts and 0.006-acre of permanent impacts).

The Procedures include measures to minimize impacts on waterbodies during construction, including limiting clearing between additional workspaces and the edge of the waterbody, constructing crossings as close to perpendicular as possible, and limiting the duration of in-stream activities. Tennessee would implement the measures in the Procedures without deviations, which Tennessee has incorporated into its project-specific ECMP.

Following construction and installation of the culverts and access roads, Tennessee would restore stream banks adjacent to the culverts to preconstruction contours and stabilize the waterbody bed and banks using seeding, installation of erosion control blankets, or installation of riprap materials, as appropriate. Tennessee would minimize surface water impacts during project operations by limiting vegetation maintenance adjacent to waterbodies to allow a 25-foot riparian strip to revegetate. Based on Tennessee's proposed construction and mitigation measures, we conclude that the Project impacts on waterbodies would be minor and would not be significant.

We received comments from about 5 residents of Edna, Texas and the EPA who were concerned with impacts on water resources, including groundwater and surface water. Project-related impacts on water resources would be contained within the construction footprint, and proposed construction measures would result in only minor impacts on water resources. The ECMP, and all the mitigation measures proposed within the various plans of the ECMP, would ensure that impacts from construction of the Project are minimized to the extent possible and are contained within the construction workspace. Hydrostatic test water would be discharged in accordance with the Plan and the Railroad Commission of Texas permit, which would ensure sediment is not deposited in sensitive environmental resource areas, including waterbodies. The SPCP would ensure that construction-related spills are contained immediately, cleaned up, and all contaminated soils are properly disposed. Operational-related spills are unlikely given the relatively small quantity of liquids contained onsite; however, if an operational spill occurred, the applicable local and state authorities would require its prompt cleanup and mitigation. Based on the avoidance and mitigation measures proposed and specified in the ECMP, there would be no impacts on water resources that would result in the degradation or pollution of waterbodies within or beyond the Project area.

2.2 WETLANDS

Wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, under normal circumstances, a prevalence of vegetation adapted for life in saturated soil conditions. Wetlands can be a source of substantial biodiversity and serve a variety of functions that include providing recreational opportunities, wildlife habitat, controlling floodwaters, and improving water quality by filtering out pollutants.

Tennessee conducted desktop analysis and field surveys to identify wetlands in the project area utilizing the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (USACE 2010), the USACE Wetland Delineation Manual (USACE 1987), and the National Wetland Inventory Maps (Cowardin et al 1979). Tennessee identified three isolated, small wetland areas within the Compressor Station 3A property that construction activities could affect. Tennessee did not identify any wetlands on the Compressor Station 11A property.

The Compressor Station 3A wetlands are within grazed pastureland and cattle drinking and wallowing have heavily affected these wetlands. Tennessee has proposed construction and operational footprints that would avoid impacts on these wetlands. In addition, Tennessee would implement the measures in its Project-specific ECMP to minimize any potential indirect impacts on these wetlands, including spills and sedimentation. Based on Tennessee's construction and mitigation measures, we conclude that impacts on wetlands would be adequately minimized and would not be significant.

2. VEGETATION, WILDLIFE, AND SPECIAL STATUS SPECIES

Tennessee conducted field surveys to identify vegetation and habitats within the Project area. Suitable habitat for aquatic species is not present within the Project sites (the drainage ditches are ephemeral and lined with concrete); therefore, fisheries and National Oceanic and Atmospheric Administration-designated essential fish habitat will not be discussed further in this EA.

10. VEGETATION

Project construction activities within the Compressor Station 3A project site would primarily affect active rangelands, including open land dominated by herbaceous (grassy and non-woody) prairie vegetation and scrub-shrub upland species. There are also small stands of woodlands on the property. Vegetation within the Compressor Station 11A site is primarily open land used for rangeland and hay cultivation. Scattered isolated trees are also within the property boundaries.

In total, 95.3 acres of open land, 13.2 acres of scrub-shrub upland, and 4.8 acres of deciduous forest would be affected by the Project during construction activities. Project operations would permanently affect 22.4 acres of open land, 4.9 acres of scrub-shrub upland, and 0.1 acre of deciduous forest that would be converted to graveled and paved surfaces.

Tennessee would restore construction areas according to its ECMP and all other applicable state and federal regulations. Areas temporarily disturbed by construction would be restored to pre-construction conditions, and re-seeded with a native perennial species mix recommended by the Caesar Kleberg Wildlife Research Institute for restoration. This seed mix would focus on wildlife and pollinator species.

The herbaceous vegetation impacts in the temporary workspaces within open land and scrub-shrub habitat would be short-term (typically one to three growing seasons). Impacts on forest vegetation would be long-term (up to 30 years) in the temporary workspaces. Lands surrounding the Project area are similar to the Project area, consisting of mostly open and scrub-shrub land with patches of woodland. These lands are primarily used for rangeland and oil and gas development.

Tennessee would also follow specific best management practices to prevent the spread of noxious weeds during construction, including cleaning all construction equipment prior to mobilization to the sites, requiring the construction contractor to use weed-free straw or hay bales for sediment barrier installations and/or mulch; and using weed-free seed mixes for post-construction revegetation. During restoration, Tennessee would monitor the area for noxious weeds, which it would control with spraying or hand removal.

Based on Tennessee's proposed construction and mitigation measures, we conclude that Tennessee has minimized impacts on vegetation to the extent practicable. Based on the availability of similar vegetated open, scrub-shrub, and woodland stands on surrounding lands, as well as Tennessee's commitment to re-seed 85.9 acres of the total 113.3 acres disturbed by construction with native plant species, we conclude that Project construction and operational impacts on the composition of local vegetation types would not be significant.

2.2 WILDLIFE

Based on the information available, correspondence with state and federal agencies, and our review, we have determined that the proposed Project would not affect significant or sensitive wildlife resources, including:

- national wildlife refuges;
- state-designated game refuges, conservation, or wildlife management areas (NatureServe 2016; Texas Parks and Wildlife Department [TPWD] 2016)
- wildlife sanctuaries;
- rookeries (the closest is about 6.9 miles east of the Compressor Station 11A property [Texas Natural Diversity Database 2016]);
- wildlife viewing areas;
- nature preserves; and
- wildlife land trusts (Humane Society of Wildlife Trust 2016; Nature Conservancy 2016).

The Project area is predominantly open pastureland with small stands of trees and scrub-shrub vegetation. The scrub-shrub and wooded areas may provide foraging and cover habitat for many species of birds, raptors, bats, deer, coyote, and small mammals.

Project construction activities could result in short-term impacts on wildlife including the displacement, stress, injury, and mortality of some mammals, reptiles, birds, and amphibians that are unable to leave the work areas.

Although individuals of some wildlife species would be affected by the Project, most of the impacts on wildlife would be short-term and limited mostly to the construction period. The Project would not permanently alter the character of available

habitats. Areas adjacent to the Project site provide similar and ample habitats for displaced wildlife during construction activities. Tennessee would reseed areas disturbed by construction with native vegetation. Based on the proposed avoidance, minimization, and restoration measures, we conclude that construction activities associated with the Project would not have a significant impact on local wildlife populations or habitat.

2.2 MIGRATORY BIRDS

Migratory birds are species that nest in the United States and Canada during the summer, and make short or long-distance migrations for the non-breeding season. These migratory species fly to and from the tropical regions of Mexico, Central and South America, and the Caribbean.

Migratory birds are protected under the Migratory Bird Treaty Act (16 U.S. Code 703-711), and bald and golden eagles are additionally protected under the Bald and Golden Eagle Act (16 U.S. Code 668-668d). The Migratory Bird Treaty Act, as amended, prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, or nests unless authorized by the USFWS. Executive Order (EO)13186 directs federal agencies to identify where unintentional take is likely to have a measurable negative effect on migratory bird populations and avoid or minimize adverse impacts on migratory birds through enhanced collaboration with the USFWS. EO 13186 emphasizes species of concern, priority habitats, and key risk factors, and that particular focus should be given to population-level impacts.

In addition to the above, the USFWS and FERC established a *Memorandum of Understanding between the Federal Energy Regulatory Commission and the U.S. Department of the Interior United States Fish and Wildlife Service about Implementation of Executive Order 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds"* in 2011. According to the memorandum of understanding, the USFWS and FERC have agreed to integrate bird conservation principles, measures, and practices into agency actions, avoid or minimize the take of migratory birds and adverse effects on their habitat, improve habitat conditions for migratory birds on lands affected by energy projects, and prevent or reduce pollution detrimental to migratory birds and their habitats. Part of FERC's commitment includes evaluating project-related impacts on species deemed most important or sensitive in a particular project area.

The USFWS has established a list of Birds of Conservation Concern, which is a subset of migratory bird species that have particular management challenges, including human-interest conflicts and low population numbers. The USFWS has identified potential habitat for 33 birds of management concern within the proposed Project area.

Tennessee proposes to start construction activities by January 2018 for an in-service date of January 1, 2019. Construction activities that occur during the nesting season for migratory birds (the USFWS indicated that it is generally late February-late

July in this region) could result in direct and indirect impacts on nesting migratory birds. Additional potential impacts include habitat loss and disruption of foraging adults. If construction activities occurred within this seasonal window, Tennessee would consult with USFWS before any vegetation clearing could occur. Tennessee has committed to conducting pre-construction surveys and avoidance of active nests if construction activities were to occur between March 1 and July 1. The USFWS also recommended minimizing disruptive activities and buildings within direct flight paths between nesting sites, roosting sites, and important foraging areas (USFWS 2007).

During Project operation, the FERC Plan prohibits routine vegetation maintenance clearing from occurring between April 15 and August 1 of any year, unless otherwise approved by the USFWS, to minimize potential impacts on migratory birds. Given the seasonal clearing restriction, Tennessee's commitment to conducting pre-construction surveys and avoiding active nests, the limited area of disturbance, and the high proportion of adjacent similar habitat associated with construction of the Project facilities, we conclude that construction would not significantly affect migratory bird individuals or populations.

2.2 SPECIAL STATUS SPECIES

Special status species are those species for which state or federal agencies provide an additional level of protection by law, regulation, or policy. Included in this category are federally listed and federally proposed species that are protected under the ESA, or are considered as candidates for such listing by the USFWS, and those species that are state-listed as threatened or endangered.

Federally Listed Species

Section 7 of the ESA ensures that any actions authorized, funded, or carried out by the agency would not jeopardize the continued existence of a federally listed threatened or endangered species or any of its designated critical habitat. The FERC, as the lead federal agency that would authorize the Project, is required to consult with the USFWS to determine if designated critical habitat or federally listed species could be affected by the Project.

Tennessee, acting as FERC's non-federal representative for complying with Section 7 of the ESA, initiated informal consultation with the USFWS Texas Coastal Ecological Services field office to determine the federally listed species potentially found in the Project area. The USFWS identified 12 federally listed threatened and endangered wildlife species (interior least tern, piping plover, northern aplomado falcon, whooping crane, red knot, Gulf coast jaguaroni, ocelot, West Indian manatee, hawksbill sea turtle, Kemp's Ridley sea turtle, leatherback sea turtle, loggerhead sea turtle) and one candidate species (golden orb mollusk) as potentially occurring near the Project.

The USFWS has designated final critical habitat for piping plover, whooping crane, hawksbill sea turtle, leatherback sea turtle, and loggerhead sea turtle; however, critical habitat does not occur within the Project area. Therefore, the Project would have *no effect* on critical habitat for these five species.

Eleven of the twelve species are not known to occur within the specific Project area, occur only as occasional transients, or habitat for the species was not identified during Tennessee's field surveys. Therefore, we have determined that the Project would have *no effect* on the interior least tern, piping plover, northern aplomado falcon, red knot, Gulf coast jaguarondi, ocelot, West Indian manatee, hawksbill sea turtle, Kemp's Ridley sea turtle, leatherback sea turtle, and loggerhead sea turtle. Potential Project impacts on the whooping crane are described below.

Whooping crane (*Grus americana*)

The USFWS identified the whooping crane as potentially occurring in the Project area during its seasonal migration. The whooping crane is a federally endangered species that migrates between wintering grounds on the Texas Gulf coast and east-central Texas to breeding grounds in Canada. In addition, there is also a population of whooping cranes that migrates between Wisconsin and Florida. The USFWS has designated five areas of critical habitat for whooping crane in Iowa, Oklahoma, Nebraska, Kansas, and Idaho where there is suitable roosting, nesting, and foraging habitat for migrating whooping cranes. This species nests around wetlands and shallow ponds with dense vegetation, and feed on insects, berries, crustaceans, acorns, and grains. Primary threats to this species include the loss of habitat to agriculture, shortened breeding season, predation, human-caused mortality, and collision with obstructions during migration (USFWS 2007).

The USFWS recommended specific mitigation measures for the whooping crane in correspondence dated August 30, 2016, which Tennessee has committed to implementing. These mitigation measures include:

- training workers to identify and report whooping cranes to the EI or monitor;
- conducting preconstruction surveys for nests during the species' breeding season;
- stopping work if a whooping crane is seen within 1,000 feet of the Project site areas, and not restarting work until the birds have left the area on their own account;
- not disturbing or removing nests during the species' breeding season;
- not collecting birds, eggs, or nests without a permit;
- avoiding wetland impacts;

- implementing best management practices and using erosion control devices to avoid sediment reaching the on-site wetlands;
- flagging cranes taller than 15 feet during the day, and lower the crane at night to minimize the chance of a whooping crane colliding into the equipment.

With the implementation of these measures, the USFWS determined that the proposed Project *may affect, but is not likely to adversely affect* the whooping crane. We concur. Therefore, ESA Section 7 consultation for this species is complete.

Should any listed species be identified in the vicinity of the proposed Project or any additional species be listed, we would re-open consultation at that time.

State Listed Species

The TPWD provided a county-specific description of state-listed species in San Patricio and Jackson Counties, Texas within a 10-mile radius of the Project. Thirty-five species were identified within this radius. Thirteen of these species (interior least tern, piping plover, northern aplomado falcon, red knot, whooping crane, Gulf coast jaguarondi, ocelot, west Indian manatee, hawksbill sea turtle, Kemp's Ridley sea turtle, leatherback sea turtle, loggerhead sea turtle, and golden orb) are also federally listed, have been addressed in the federally listed species section above, and will not be addressed further in this section. There is no suitable habitat for 19 of the remaining 22 state-listed species; therefore, we conclude that there would be no impact on these 19 species and will not address them further in this section. There is potentially suitable habitat within the Project area for the three remaining state-listed species –sheep frog, white-tailed hawk, and Texas tortoise. The sheep frog can be found in wetlands, which are on the Project property, but will be avoided during construction. The white-tailed hawk could also potentially feed on the honey mesquite trees that are found within the Project area, but could easily leave the area if disturbed by construction activities. The Texas tortoise usually occupies open areas with nearby dense cover, and feeds on cacti and other succulents. There are small areas of dense cover and cactus within the proposed Compressor Station 3A property, however, most of the Project area, including Compressor Station 11A, has unsuitable tortoise habitat.

We have determined that based on Tennessee's commitment to adopt the mitigation measures, construction, and maintenance activities outlined in Tennessee's ECMP, which includes the mitigation measures from our Plan and Procedures, during Project construction activities, the proposed Project would not result in a significant impact on any state-listed species.

1. LAND USE, RECREATION, AND VISUAL RESOURCES

Construction of the Project would impact land use at the compressor station sites as described in the following sections. Land use types affected by the Project include:

- agricultural/rangeland. These are non-forested lands rotated between grazing and hay production; and
- forest land.

Temporary and permanent land cover impacts are summarized in table 3.

Land Use Type	Compressor Station 3A ¹		Compressor Station 11A ¹	
	Construction Impact (Acres)	Permanent/Operational (Acres)	Construction Impact (Acres)	Permanent/Operational (Acres)
Agricultural and Rangeland land	67.4	13.3	41.1	14
Forest Woodland	4.8	0.1	0	0
Total²	72.2	13.4	41.1	14
1 Acreages are inclusive of the new access roads				
2 Rows may not sum to total due to rounding				

10. AGRICULTURAL/RANGELAND

The Compressor Station 3A property is mostly undeveloped grassland/herbaceous land crossed by Tennessee's existing right-of-way for 100-1 and 100-2 Lines and used primarily for rangeland. Construction of Compressor Station 3A and a new access road would affect 67.4 acres of agricultural land and/or rangeland during construction. Operation of the compressor station (including the new access road) would permanently convert approximately 13.4 acres of land, 13.3 acres of which is currently rangeland, to industrial use.

The Compressor Station 11A site is undeveloped grassland/herbaceous area used for agriculture (hay production) and rangeland. The site is crossed by Tennessee's existing right-of-way for the 100-1 and 100-2 Lines. Construction of Compressor Station 11A and a new access road would affect approximately 41.1 acres of agricultural land and/or rangeland during construction. Operation of the facility (including the access road) would permanently convert approximately 14.0 acres of agricultural and rangeland to industrial use.

Approximately 12.5 acres and 12.2 acres of the permanently maintained land would be fenced in during operation of Compressor Stations 3A and 11A, respectively.

Tennessee would maintain the security fences required for operation, while the remainder of the parcels would not be fenced. Tennessee would not disturb existing fencing on neighboring parcels.

Following construction, disturbed work areas would be graded to match preconstruction contours and drainage patterns. Disturbed temporary work areas would be reseeded with native seeds, recommended by the Caesar Kleberg Wildlife Research Institute and would be suited for restoration, wildlife, and pollinator species.

The property, excluding the permanent fenced site and access road, would revert to open land. Given the abundance of grassland/herbaceous areas in the region, the conversion of existing land use within the permanent fenced site and access road to industrial use would have negligible impact on land use in the region.

2.2 FOREST/WOODLAND

The Compressor Station 3A property includes an area of forest/woodland along the southern border of the site. Construction of Compressor Station 3A would affect approximately 4.8 acres of forest woodland during construction. Operation of the facility (including the new access road) would permanently convert approximately 0.1 acre of land from forest woodland to industrial use. This impact on land use would be negligible. No impacts on forest land would occur at Compressor Station 11A.

2.2 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

No residences occur within 0.25 mile of the Compressor Station 3A permanent fenced site and associated access road. No commercial structures occur within 200 feet of the Compressor Station 3A property; however, two structures, including a barn and a private outhouse are on the property about 800 feet south of the proposed Compressor Station 3A permanent fenced site. These structures will be demolished and removed during construction.

No residential or commercial structures occur within 200 feet of the Compressor Station 11A operational site. The nearest residence is approximately 600 feet southeast of the proposed Compressor Station 11A site, with an associated barn approximately 275 feet southeast of the property. There is a commercial building off North Brazos Street, near the entrance of the proposed permanent access road, approximately 100 feet southeast of the access road to the site.

No planned or future residential or commercial developments or land use plan designations were identified within 0.25 mile of the Compressor Station 3A or 11A sites (Jackson County Economic Development Board 2016; San Patricio County Economic Development Board 2016). No direct impacts on residential land or planned development are expected.

2.2 PUBLIC LAND AND OTHER DESIGNATED AREAS

None of the following designated areas are within the proposed Project area:

- Native American reservations;
- lands owned or controlled by private preservation/conservation groups;
- federal, state, or local agencies,
- scenic places; and
- Texas Coastal Zone Management Area (Texas 2016).

Additionally, both properties are privately owned. Therefore, no impacts on public land and other designated areas are expected.

5.5 SPECIAL LAND USES

No orchards, nurseries, specialty crops, conservation lands, lands held in trust, landfills, operating mines, remnant prairies, old-growth forests, registered natural landmarks, wilderness areas designated under the Wilderness Act, or hazardous waste sites are located within 0.25 mile of either compressor station site (EPA 2016c; Wilderness.net 2016; National Conservation Easement Database 2015; The Nature Conservancy 2016; USGS 2016; National Park Service 2016a, b; Sierra Club 2016; Humane Society Wildlife Land Trust 2016). In addition, no churches, hospitals, cemeteries, or schools were identified within 0.25 mile of either site. Therefore, no impacts on special land uses are expected.

2.2 RECREATION AND PUBLIC INTEREST AREAS

No state or local designated trails, nature preserves, game management areas, national or state forests, national or state parks, golf courses, public or private hunting areas, designated recreational areas, or lands included in or designated for study for inclusion in the National Trails System are located within 0.25 mile of the Project (TPWD 2016; National Recreational Trails 2016). Therefore, no impacts on recreation and public interest areas are expected.

5.7 FLOODPLAINS

EO 11988 directs federal agencies to (1) avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains, and (2) avoid the direct or indirect support of floodplain development whenever there is a practicable alternative. The EO 11988 establishes avoidance of actions on the base of the floodplain, or the 100-year floodplain, as the preferred method for meeting these requirements.

Flooding potential is generally described in terms of flooding recurrence intervals, such as the 100-year or 500-year flood. The 100-year floodplain is the area projected to be inundated by a storm that has a one percent probability of occurring in any year. The 500-year floodplain is the area projected to be inundated by a storm with a 0.2 percent probability of occurring in any year. Federal Emergency Management Agency Flood Insurance Rate Maps (FIRM) outlines flood risk zones within communities and is usually issued following a flood insurance study that summarizes the analysis of flood hazards within the subject community.

FIRM indicate the presence of two types of flood zones within the Compressor Station 3A property. Approximately 35 acres (31 percent) of the Compressor Station 3A property occur within Zone A of the 100-year floodplain and an additional 25 acres (22 percent) occur within Zone X of the 500-year floodplain, of Chiltipin Creek. There is not a base flood elevation that is associated with the Zone A FIRM areas. Based on site elevation survey data, Tennessee calculated the influence of this line to yield a basic 100-year flood elevation to be at approximate elevation 51.7 feet amsl. To account for flood height increases from wind-generated waves, Tennessee utilized the coastal Zone AE 1.5 foot maximum wave effect height for implementing flood damage prevention measures at Compressor Station 3A. Therefore, the maximum elevation affected by the 100-year wave effect would be 53.2 feet above amsl.

FIRM maps indicate the presence of two types of flood zones within the Compressor Station 11A property. Approximately 12 acres (24 percent) of the Compressor Station 11A property occur within Zone AE of the 100-year floodplain and an additional 14 acres (27 percent) occur within Zone X of the 500-year floodplain, of Dry Creek. The base flood elevation for the 100-year flood elevation for Compressor Station 11A is 68.4 feet amsl. To account for flood height increases from wind-generated waves, Tennessee utilized the coastal Zone AE 1.5 foot maximum wave effect height for implementing flood damage prevention measures at Compressor Station 11A. Therefore, the maximum elevation affected by the 100-year wave effect would be 69.9 feet amsl.

The permanent operational footprint of Compressor Station 3A is in both the 100-year floodplain (0.4 acre of Zone A) and the 500-year floodplain (8.7 acres of Zone X). Based on the estimated elevations, the volume of flood area displaced by the proposed Compressor Station 3A, including access roads, is as follows:

- 200 cubic yards of Zone A Flood Displacement; and
- 18,700 cubic yards of Zone X Flood Displacement. Note that this volume includes the area of Zone A.

The permanent operational footprint of Compressor Station 11A is in both the 100-year floodplain (5.6 acre of Zone AE) and the 500-year floodplain (2.0 acres of Zone X). The volume of flood area displaced by the proposed Compressor Station 11A, including access roads is as follows:

- 18,400 cubic yards of Zone AE Flood Displacement; and
- 6,000 cubic yards of Zone X Flood Displacement. Note that this volume includes the area of Zone AE.

Tennessee would comply with the provisions of San Patricio and Jackson County's Flood Damage Prevention Ordinance in the design, construction, and operations of the facility. Accordingly, Tennessee's facility would include, where applicable:

- buildings having the lowest floor (including basement) elevated to include at least 18 inches of freeboard above the base flood elevation, or
- water-tight walls that are substantially impermeable to the passage of water where under the base flood elevation; and
- walls that are resistant to the hydrostatic and hydrodynamic loads and forces of buoyancy;
- proper and regulated design and installation practices for electrical components;
- driven and other operational equipment bottoms would be set a minimum of 4 feet above the estimated flood elevation to account for mitigating wave effects and larger flood events as practicable;
- equipment within floodplain limits would be properly anchored;
- the lowest portion of the operation area finished grade for the facility would be a minimum of 1 foot above the base flood elevation or estimated flood elevation; and
- access box-culvert bridge crossings would be designed in accordance with County requirements and sufficient to pass the anticipated flood volumes.

Because of the limited volume of flood displacement, the extent of the 100-year and 500-year floodplains and after review of the updated FIRM, we conclude that the compressor stations would not result in a floodplain rise as a result of its partial placement within the floodplain. Additionally, because Compressor Station 3A is within the outer limits of the floodplain, Compressor Station 11A is within the floodway fringe, and with Tennessee's incorporation of the above flood damage prevention measures, we conclude no impacts from high velocity flows, debris, or scour and no increase in the potential for off-site affects from scour are likely.

2.2 VISUAL RESOURCES

The proposed Project could alter existing visual resources in two ways: (1) construction activity and equipment may temporarily alter the viewshed; and (2) aboveground facilities would represent permanent alterations to the viewshed. The significance of these visual impacts primarily would depend on the quality of the viewshed, the degree of alteration of that view, the sensitivity or concern of potential viewers, and the perspective of the viewers.

Construction would result in temporary visual impacts including increased numbers of construction personnel, equipment, and materials, removal of vegetative cover, and disturbance of soils. These impacts would generally cease following the completion of construction and restoration.

Compressor Station 3A

Tennessee completed visual simulations to assess the permanent potential visual impacts on nearby residences from the proposed stations.¹⁴ Compressor Station 3A would not be visible from the residences to the north and west of the site, would be fully visible from the residence to the east, and partially visible from the residence to the south. Construction of Compressor Station 3A would result in a permanent change in the viewshed and would add an industrial element to a currently rural setting.

Movement of construction equipment and materials along State Highway 188 (SH 188) may be visible to nearby residences and motorists traveling along these roadways. Visual impacts associated with construction traffic would be short-term and temporary, lasting only for the duration of construction activities. The 75-foot-wide wooded buffer area along SH 188 at the southern boundary of the Compressor Station 3A site provides some screening to motorists traveling on SH 188, as well as the residence to the south.

Compressor Station 11A

According to the visual simulations conducted by Tennessee from specific locations in neighboring yards, Compressor Station 11A would not be visible from the surrounding residences. Views would be obscured by trees for the surrounding residences. However, portions of Compressor Station 11A may be visible from the closest neighbor's driveway, among other locations within their yard.

Movement of construction equipment and materials along U.S. Highway 59 may be visible to nearby residences and motorists traveling along this roadway. Visual impacts associated with construction traffic movement would be short-term and temporary, lasting only for the duration of construction activities.

Tennessee would implement the following measures to minimize permanent visual impacts:

- locating aboveground compressor station facilities out of the viewshed of homes and roadways to the extent feasible;
- maintaining an existing 75-foot-wide wooded buffer along the compressor station property boundaries where woody vegetation exists and to the extent feasible;

¹⁴ The visual simulations are available on FERC's website under accession number 20161219-5403 (available in Attachment 8-1.)

- painting buildings and equipment to blend into the existing natural environment; and
- placing and installing downward-facing, shielded lights to mitigate off-site exposure.

We received multiple comments regarding visual impacts associated with the construction of both compressor stations. Tennessee has committed to working with landowners regarding the need for visual screening and other mitigation measures at the compressor station sites. However, Tennessee has not proposed a visual screening plan to minimize viewshed impacts on the nearby residences; therefore, **we recommend that:**

Prior to construction, Tennessee should file with the Secretary of the Commission (Secretary) a visual screening plan for Compressor Stations 3A and 11A that includes vegetative screening of the proposed compressor station sites, for review and written approval by the Director of the Office of Energy Projects (OEP).

Through Tennessee's implementation of proposed construction and mitigation measures, and our recommendation, we conclude that visual impacts would be minimized.

2.2 WILDLIFE

We received comments from the public concerned about night-time lighting and potential glare at Compressor Stations 3A and 11A. Continuous night-time lighting would be necessary at the entrance security gate and the outdoor entry at each building for safety and security purposes. These security lights would be photocell controlled (i.e., lit during dark hours only), low-watt lights with high cut-off fixtures that would be hooded to shine downward to shield the lights from direct view. The security lights would be visible to off-site observers as an indirect light. For all nonessential lighting, Tennessee would implement the following measures to minimize potential impacts:

- all station lighting would have high cut-off fixtures to direct light downward and shield the lights from view;
- station yard lighting would be zoned and would not be lit at night under normal operating conditions; and
- in the unlikely event of night work, individual zones would be manually switched on to allow site personnel the minimum necessary lighting directed at a particular work area.

Based on the mitigation measures proposed by Tennessee, impacts from night-hour lights would be minimal and, therefore, would not result in significant impacts on nearby residents.

5.10 SCENIC PLACES

No national or state wild and scenic rivers, designated scenic areas, or lands included in or designated for study for inclusion in the National Wild and Scenic Rivers System (“NWSRS”) are located within 0.25 mile of the compressor station sites (NWSRS 2016a, NWSRS 2016b).

Construction and operation of the Project would not result in visual impacts on national scenic highways, scenic trails, designated scenic areas, or wild and scenic rivers.

1. SOCIOECONOMICS

10. POPULATION, EMPLOYMENT, AND HOUSING

San Patricio County’s population, where Compressor Station 3A is proposed, is approximately 67,000 people (Texas Administrative Code [TAC] 2016a). The county’s average civilian labor force is more than 30,000, representing approximately 61 percent of the total population. The average unemployment rate is approximately seven percent, slightly higher than the state’s unemployment rate of 4.5 percent. The per capita income for the County is \$23,741 (United States Census Bureau [USCB] 2015). Several hotel/motel options and one recreational vehicle park are available in the communities surrounding the Compressor Station 3A site. Rental vacancy rates in these communities range from approximately 0 to 12 percent, with about 1,115 rental units available in San Patricio County (USCB 2015). Additional housing is also available in nearby cities and counties, with about 5,300 rental units available in nearby Corpus Christi, Texas, which is 27 miles southeast of Sinton.

Jackson County’s population, where Compressor Station 11A is proposed, is approximately 15,000 people (TAC 2016b). The average civilian labor force is approximately 6,000 representing approximately 58 percent of the population. The average unemployment rate in Jackson County is approximately four percent, comparable to the state’s unemployment rate of 4.5 percent. The per capita income for the county is \$23,368 (USCB 2015). Several hotel/motel options and two campgrounds are available in nearby communities surrounding the compressor station site. Rental vacancy rates in these communities range from approximately 12 to 35 percent, with about 270 rental units available in Jackson County. An additional 844 rental units are available in nearby Matagorda County, which is adjacent to Jackson County to the southeast.

The construction of the compressor stations are each expected to create an average of 110 temporary construction jobs at each Project site (145 at the peak) over the construction period and 1 permanent job. Tennessee would attempt to hire local and regional construction workers to the extent feasible, provided these workers possess the necessary skills for compressor station construction. However, it is anticipated that 90 percent of the construction personnel would come from outside the local area.

Temporary and long-term permanent impacts on population are expected to be negligible. The number of new jobs and indirect jobs from construction and operation would not cause significant socioeconomic impacts in either county. We conclude impacts on available housing and lodging would be temporary and not significant because of the relatively small labor force required and impacts would last only for the duration of construction activities, about ten months.

2.2 ECONOMY

The major economic sectors in the communities near Compressor Station 3A include local government, construction, trade, transportation and utilities, leisure and hospitality, and education and health services. These economic sectors drive the local economies in the Cities of Sinton, Ingleside, and Mathis located near Compressor Station 3A. The per capita income for these communities ranges from \$15,410 to \$23,184 and is \$23,741 in Jackson County.

The major economic sectors in the communities near Compressor Station 11A include local government, trade, transportation and utilities, natural resources, mining and construction, education, health services, and leisure and hospitality. In the City of Edna, located near Compressor Station 11A, educational services, health care, and social assistance also drive the local economy. The per capita income in Edna is \$18,511 and \$23,368 in San Patricio County.

State tax rates are 6.265 percent and sales and use tax revenues total approximately \$29 million and property tax revenues total approximately \$1.5 million.

Construction activities would have a beneficial impact on local and regional businesses. Construction workers could spend as much as 20 to 30 percent of their income on goods, services, and entertainment, in addition to money spent on temporary housing by non-local workers. Local and/or regional businesses would also benefit from construction material and equipment fuel purchases.

Construction and operation of the Project would result in increased tax revenues for the State of Texas and the counties in which the compressor stations would be constructed, in addition to other local taxing authorities. During operations, Tennessee would pay ad valorem taxes based on the assessed value of the completed compressor stations.

The anticipated sales tax revenues from construction materials purchases, based on 6.25 percent state sales tax rate plus 2.0 percent local sales tax rate for the City of Sinton (as of April 2016), is approximately \$82,500. During operations, Tennessee estimates that annual sales tax revenues associated with Compressor Station 3A would be approximately \$21,255 based on an annual operation and maintenance budget of \$327,000. Tennessee would also pay annual ad valorem taxes based on the assessed

value of the Compressor Station 3A property. Annual ad valorem taxes for Compressor Station 3A property are estimated to be \$217,359.

The anticipated sales tax revenues from construction materials purchases, based on 6.25 percent state sales tax rate plus 2.0 percent local sales tax rate for the City of Edna (as of April 2016), is approximately \$82,500. During operations, Tennessee estimates that annual sales tax revenues associated with Compressor Station 11A would be approximately \$26,300 based on an annual operation and maintenance budget of \$438,000. Tennessee would also pay annual ad valorem taxes based on the assessed value of the Compressor Station 11A property. Annual ad valorem taxes for the Compressor Station 11A property are estimated to be \$211,000.

10. EXPANSIVE SOILS

Existing local government public services within the communities near the compressor station sites include police/sheriff, fire protection, medical services, and educational institutions.¹⁵ Construction of Compressor Stations 3A and 11A could result in a temporary increased demand on public services. Potential temporary impacts on services could include traffic-related incidents, medical emergencies, increases in traffic violations, and issuances of permits for vehicles subject to load and width restrictions.

Although the potential for police, fire, and medical services may increase slightly during construction activities, adequate public services exist in the Project area to handle a civil, criminal, or emergency event. Furthermore, there would be no large influx of workers residing in any one community. It is anticipated that non-local construction workers would not relocate with school-age children due to the generally rural and remote setting of the Project area and relatively short duration of construction activities. For these reasons, impacts on public services during construction are expected to be negligible.

During operation, the largest potential impact on public services would be associated with an emergency situation affecting the reliability or integrity of the natural gas facilities. Safety design measures and emergency response protocols are addressed in section B.10, Reliability and Safety.

2.2 TRANSPORTATION AND TRAFFIC

Transportation systems in the Project area include a network of local, state, and federal roadways. Local and state highways provide ready access to the compressor station sites, which lie in sparsely populated, rural areas.

¹⁵ The list of public services is available in table 5-4, Resource Report 4 is available on FERC's E-Library website under the accession number 20160819-5293.

The Compressor Station 3A site is proposed on the north side of SH 188, approximately 0.23 mile west of County Road (“CR”) 2367. SH 188 is a paved two-lane, east-west highway with an unnamed dirt and gravel access road leading into Compressor Station 3A. CR 2367 is paved and has two lanes running north and south respectively. Average daily traffic was 2,231 on SH 188 in this area in 2014 (Texas Department of Transportation [TXDOT] 2014).

The Compressor Station 11A site is proposed approximately 0.5 mile north of US Highway 59, which is a paved, four-lane, mostly north-south highway. CR 117 N (a.k.a. North Brazos Street) is initially a paved road that terminates at a private dirt and gravel one-lane route to Compressor Station 11A from its intersection with the frontage road of US Highway 59. Currently, there is a dirt access road leading into the proposed Compressor Station 11A site. CR 117 N extends approximately 0.62 mile from its intersection with the frontage road of US Highway 59 to termination at Compressor Station 11A. Average daily traffic was 22,087 on US Highway 59 in this area in 2014 (TXDOT 2014).

For construction of each compressor station, Tennessee estimates an average of six round-trips per day for trucks delivering equipment and materials, and approximately 80 vehicles per day for construction workers commuting to the site. Construction activities are anticipated to occur six days per week for approximately ten months. Increased traffic associated with equipment and material deliveries and workers commuting to the site may affect motorists using roadways in the vicinity.

A permanent access road leading into Compressor Station 3A from SH 188 would be constructed. Nearby residents may utilize SH 188, CR 2367, or other nearby county roads to access their residences. Motorists accessing residences near SH 188 and CR 2367 and CR 2249 may experience delays as construction-related traffic enters and exits the site. A permanent access road leading into Compressor Station 11A would be constructed from CR 117 N (a.k.a. North Brazos Street) where it turns toward the southwest. Motorists accessing residences in this area may experience delays as construction-related traffic enters and exits the site. Tennessee has committed to minimizing traffic disturbance through scheduling, signage, and carpooling, as well as complying with any highway use permit conditions. Based on the temporary and short-term potential traffic interruptions, we conclude that impacts to Project-related traffic are insignificant.

2.2 PROPERTY VALUES

Several commenters expressed concerns about potential adverse effects on property values resulting from the Project’s construction and operation. Tennessee would compensate the landowners for purchase of new land, any temporary loss of land use, and any damages. The impact that a natural gas project could have on the value of any land parcel depends on many factors. These include the size of the parcel, the parcel’s current

value and land use, and the value of other nearby properties. However, subjective valuation is generally not considered in appraisals. This is not to say that the Project would not affect resale values. Potential purchasers may make a decision based on intended future use and, if the presence of the Project facilities in the general area would make that use undesirable, it is possible that the potential purchaser would not acquire that parcel. However, each potential purchaser has differing criteria and means. According to a January 2016 study, “A Study of Natural Gas Compressor Stations and Residential Property Values”, no data was uncovered that suggests that proximity to a compressor station measurably impacts value or land use. The study shows that compressor stations appear to have no widespread, systematic impact on value or land use.

2.2 ENVIRONMENTAL JUSTICE

We received one comment regarding environmental justice. EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires that environmental analyses of federal actions address any disproportionately high and adverse human health or environmental effects on minority and low-income communities.

In its guidance for the consideration of environmental justice under NEPA, the CEQ defines a “minority” as an individual who is American Indian or Alaskan Native, Black or African American, Asian, Native Hawaiian or Pacific Islander, Hispanic or Latino. CEQ characterizes a “minority population” as existing in an affected area where the percentage of defined minorities exceeds 50 percent of the population, or where the percentage of defined minorities in the affected area is meaningfully greater (10 percent higher) than the percentage of defined minorities in the general population or other appropriate unit of geographic analysis. The CEQ guidance further recommends that low-income populations in an affected area should be identified using data on income and poverty from the U.S. Census Bureau (CEQ 1997). Low-income populations are populations where households have an annual household income below the poverty threshold, which is currently \$24,600 for a family of four (HHS 2017).

Census Tract 109, in which the Compressor Station 3A property is proposed, is 59 percent minority, about the same as the county, lower than the closest city (City of Sinton), and higher than the State of Texas (54 percent). Further, Census Tract 109 shows approximately 10.8 percent of the population below the poverty level, lower than both the County and the State.

Census Tract 9502, in which the Compressor Station 11A property is proposed, is approximately 47 percent minority, higher than Jackson County and lower than the nearest city (City of Edna). Approximately 13.5 percent of households in Jackson County and 17.2 percent in Edna live below the poverty level as compared to the state of Texas average of 17.7 percent. Census Tract 9502 shows approximately 17.6 percent of

the population below the poverty level, which is comparable to Edna and the State and higher than Jackson County.

As previously described, low-income and minority individuals were identified in the project areas for both Compressor Stations 3A and 11A through the review of U.S. Census data. Minority populations and low income populations (as defined by CEQ) were identified in Census Tract 109 and Census Tract 9502 in which the compressor stations are proposed. Tennessee sited its compressor stations based on hydraulic constraints, system requirements, and intention to be in rural areas with fewer impacts on number of individuals. Sites with smaller populations of minority and low income individuals were not available for either compressor station site. In addition, for Compressor Station 11A, sites further northeast of Highway 111 had higher populations of both low income and minority individuals than the proposed Compressor Station 11A site. As described throughout this EA, the proposed Project would not have a significant adverse impact on the environment nor on individuals living in these census tracts. Therefore, the Project would not have a disproportionately high adverse environmental or human health impact on minority or low income residents.

1. CULTURAL RESOURCES

Section 106 of the National Historic Preservation Act, as amended, requires the FERC to take into account the effects of its undertakings on properties on, or eligible for listing on, the National Register of Historic Places, and to afford the Advisory Council on Historic Preservation an opportunity to comment. Tennessee, as a non-federal party, is assisting us in meeting our obligations under Section 106 and the implementing regulations at 36 CFR 800.

Tennessee conducted a cultural resource survey for the Project areas including the permanent easement, temporary workspace, and access roads. The survey included archival research, and archaeological and aboveground historic resources survey. Archaeological survey methodology included surface inspection and shovel testing. The survey occurred before Tennessee had finalized plans; therefore, an area larger than the current Project area was surveyed. In total, about 162 acres were surveyed for cultural resources, including about 112 acres for Compressor Station 3A, and about 50 acres for Compressor Station 11A.

No archaeological sites or aboveground historic resources were identified within the two compressor station parcels. The survey identified three aboveground historic resources within a 0.25-mile survey area for indirect effects for Compressor Station 3A, but recommended that they were not eligible for listing on the National Register of Historic Places. No aboveground historic resources were identified within the 0.25-mile survey area for Compressor Station 11A.

Tennessee provided the resulting cultural resources survey report to the FERC and the Texas State Historic Preservation Office (SHPO). On June 7, 2016, the SHPO concurred with Tennessee that the Project would have no effect on historic properties. We concur as well.

Tennessee sent project information to the following five federally recognized Native American tribes that were identified as having a potential interest in project effects: Apache Tribe of Oklahoma; Comanche Nation, Oklahoma; Kiowa Indian Tribe of Oklahoma; Tonkawa Tribe of Indians of Oklahoma; and Wichita and Affiliated Tribes (Wichita, Keechi, Waco, and Tawakonie), Oklahoma.

Tennessee received a response from the Comanche Nation that no properties of significance were identified within the Project area. No other responses were received.

We sent our NOI to the same tribes. No responses to our NOI were received. On November 28, 2016, we sent follow-up letters to the tribes, inviting their participation in consultation. To date, we have received no responses.

Tennessee provided an Unanticipated Discovery Plan to deal with the unexpected discovery of historic properties and human remains during construction. We requested a revision to the plan. Tennessee provided a revised plan which we find acceptable.

Based on the information provided by Tennessee, and in consultation with the Texas SHPO and Native American tribes, we conclude that the project would have no effect on cultural resources.

1. AIR QUALITY

Air quality in the Project area would be affected by construction and operation of the Project. Although air emissions would be generated by construction activities involving the proposed compressor stations, the majority of air emissions associated with the Project would result from operation of the new Compressor Stations 3A and 11A.

The term air quality refers to relative concentrations of pollutants in the ambient air. The subsections below describe air quality concepts that are applied to characterize air quality and to determine the significance of increases in air pollution.

10. EXISTING ENVIRONMENT

The Project area encompasses two counties in southeastern Texas: San Patricio and Jackson Counties. The climate in San Patricio County is characterized by hot, humid summers and generally mild to cool winters with an average temperature of 45 degrees Fahrenheit (°F) in January to an average high of 95°F in August. Average precipitation is 34 inches per year, with well-distributed rainfall throughout the year (National Climatic Data Center [NCDC] 2016).

Jackson County is characterized by hot, humid summers and generally mild to cool winters with an average temperature of 43°F in January and an average high of 95°F in August. Average precipitation is 39.7 inches per year, with the wettest months being May and June (NCDC 2016).

Ambient air quality is protected by the Clean Air Act (CAA) of 1970, as amended in 1977 and 1990. The EPA oversees the implementation of the CAA and establishes National Ambient Air Quality Standards (NAAQS) to protect human health and welfare.¹⁶ NAAQS have been developed for seven “criteria air pollutants”, including nitrogen dioxide (NO₂), carbon monoxide (CO), ozone, sulfur dioxide (SO₂), particulate matter less than or equal to 2.5 microns in aerodynamic diameter (PM_{2.5}), particulate matter less than or equal to 10 microns in aerodynamic diameter (PM₁₀), and lead, and include levels for short-term (acute) and long-term (chronic) exposures. The NAAQS include two standards, primary and secondary. Primary standards establish limits that are considered to be protective of human health and welfare, including sensitive populations such as children, the elderly, and asthmatics. Secondary standards set limits to protect public welfare, including protection against reduced visibility and damage to crops, vegetation, animals, and buildings (EPA 2016e). At the state level, the TCEQ has adopted the NAAQS, as promulgated by the EPA, and does not have any additional standards. Additional pollutants, such as volatile organic compounds (VOC) and hazardous air pollutants (HAP), are emitted during fossil fuel combustion. These pollutants are regulated through various components of the CAA that are discussed further in section 8.2.

The EPA, and state and local agencies have established a network of ambient air quality monitoring stations to measure concentrations of criteria pollutants across the U.S. The data are then averaged over a specific time period and used by regulatory agencies to determine compliance with the NAAQS and to determine if an area is in attainment (criteria pollutant concentrations are below the NAAQS), nonattainment (criteria pollutant concentrations exceed the NAAQS) or maintenance (area was formerly nonattainment and is currently in attainment). San Patricio and Jackson Counties are both designated attainment for all criteria pollutants (EPA 2016a, 2016e, 2016f).

The EPA now defines air pollution to include greenhouse gases (GHGs), finding that the presence of GHGs in the atmosphere may endanger public health and welfare through climate change. GHGs occur in the atmosphere both naturally and as a result of fossil fuel combustion and land use change. As with any fossil fuel-fired project or activity, the Project would contribute GHG emissions. The primary GHGs that would be emitted by the Project are carbon dioxide (CO₂), methane, and nitrous oxide. Emissions of GHGs are typically quantified and regulated in units of carbon dioxide equivalents (CO₂e). The CO₂e takes into account the global warming potential (GWP) of each GHG.

¹⁶ The current NAAQS are listed on EPA's website at <https://www.epa.gov/criteria-air-pollutants/naaqs-table>.

The GWP is the measure of a particular GHG's ability to absorb solar radiation as well as its residence time within the atmosphere. The GWP allows comparison of global warming impacts between different gases; the higher the GWP, the more that gas contributes to climate change in comparison to CO₂. Thus, CO₂ has a GWP of 1, methane has a GWP of 25, and nitrous oxide has a GWP of 298.¹⁷

2.2 REGULATORY REQUIREMENTS

The provisions of the CAA that are applicable to the Project are discussed below. The estimated potential operational emissions for Compressor Stations 3A and 11A, and the major regulatory thresholds, are shown in table 5.

Prevention of Significant Deterioration and Nonattainment New Source Review

Proposed new or modified air pollutant emission sources must undergo a New Source Review (NSR) prior to construction or operation. Through the NSR permitting process, state and federal regulatory agencies review and approve project emissions increases or changes, emissions controls, and various other details to ensure air quality does not deteriorate as a result of new or modified existing emission sources. The three basic categories of NSR permitting are Prevention of Significant Deterioration (PSD), Nonattainment New Source Review (NNSR), and minor source NSR. PSD, NNSR, and minor source NSR are applicable to projects depending on the size of the proposed project, the projected emissions, and if the project is proposed in an attainment area or nonattainment/maintenance area. The TCEQ administers the PSD and NNSR permitting programs in Texas. PSD regulations define a major source as any source type belonging to a list of name source categories that have a potential to emit 100 tons per year (tpy) or more of any regulated pollutant or 250 tpy for sources not among the listed source categories. These are referred to as the PSD major source thresholds.

Compressor Stations 3A and 11A are not anticipated to exceed the PSD major source thresholds for any pollutants and are considered minor sources located in attainment areas. Therefore, the proposed construction and operation of Compressor Stations 3A and 11A does not trigger PSD review or NNSR.

Title V Permitting

Title V is an operating air permit program run by each state for each facility that is considered a "major source." The major source threshold for an air emission source is 100 tpy for criteria pollutants, 10 tpy for any single HAP and 25 tpy for total HAPs. The

¹⁷ These GWPs are based on a 100-year time period. We have selected their use over other published GWPs for other timeframes because these are the GWPs the EPA has established for reporting of GHG emissions and air permitting requirements. This allows for a consistent comparison with these regulatory requirements.

proposed Compressor Stations 3A and 11A are considered minor sources and would therefore not require a Title V permit.

New Source Performance Standards

The EPA promulgates New Source Performance Standards (NSPS) for new, modified, or reconstructed sources to control emissions to the level achievable by the best-demonstrated technology for stationary source types or categories as specified in the applicable provisions discussed below. NSPS also establishes fuel, monitoring, notification, reporting, and recordkeeping requirements.

NSPS Subpart JJJJ sets emissions standards for nitrogen oxides (NO_x), CO, and VOC for emergency and non-emergency engines. Subpart JJJJ would apply to the emergency generators at Compressor Stations 3A and 11A.

NSPS Subpart KKKK applies to stationary combustion turbines with a heat input rating greater than or equal to 10 million British thermal units (MBTU) per hour and sets limits on NO_x and SO₂ emissions. Subpart KKKK applies to Compressor Stations 3A and 11A.

NSPS Subpart OOOOa sets emission standards and compliance schedules for VOC and SO₂ emissions for new, modified, or reconstructed wet seal centrifugal compressor and reciprocating compressors; limits for bleed rates for natural-gas driven pneumatic controllers; requires work practice standards for compressor rod packing compressor units; and sets fugitive leak monitoring and repair requirements for compressor stations. The various components of Subpart OOOOa would apply, as applicable, to Compressor Stations 3A and 11A.

National Emission Standards for Hazardous Air Pollutants

The 1990 CAA Amendments established a list of 189 HAPs, resulting in the promulgation of National Emission Standards for Hazardous Air Pollutants. The National Emission Standards for Hazardous Air Pollutants regulate HAP emissions from specific source types located at major or area sources of HAPs by setting emission limits, monitoring, testing, record keeping, and notification requirements. Compressor Stations 3A and 11A would have the potential to emit less than the combined HAP total threshold of 25 tpy and single HAP threshold of 10 tpy, and are therefore considered an area (and not major) source of HAPs. The applicable regulations for area sources are described below.

Subpart ZZZZ applies to all reciprocating internal combustion engines at area sources and would therefore apply to the emergency generators at Compressor Stations 3A and 11A. However, Tennessee would comply with Subpart ZZZZ by meeting the requirements of NSPS JJJJ.

General Conformity

The lead federal agency must conduct a conformity analysis if a federal action would result in the generation of emissions that would exceed the conformity threshold levels of the pollutant(s) for which a county is designated nonattainment or maintenance. Estimated emissions for the Project are not subject to review under the general conformity thresholds because the Project is in an area classified as attainment/unclassifiable for all criteria pollutants.

Greenhouse Gas Emissions and the Mandatory Reporting Rule

The EPA's Mandatory Reporting of Greenhouse Gases Rule requires reporting from applicable sources of GHG emissions if they emit greater than or equal to 25,000 metric tons of GHG (as CO₂e) in 1 year. The Mandatory Reporting Rule does not require emission control devices and is strictly a reporting requirement for stationary sources based on actual emissions. Although the rule does not apply to construction emissions, we have provided GHG construction emission estimates, as CO₂e, for accounting and disclosure purposes in section B.8.4. Operational GHG emission estimates for the Project are presented, as CO₂e, in section B.8.5. Based on the emission estimates presented, actual GHG emissions from operation of Compressor Stations 3A and 11A would likely exceed the 25,000-tpy reporting threshold and reporting requirements for the Mandatory Reporting Rule would therefore be applicable to the Project.

10. STATE AIR QUALITY REGULATIONS

This section discusses the potentially applicable state air regulations for the proposed facility. In addition to federal standards, the TCEQ establishes permit review procedures for construction and/or operating permits for stationary sources of emissions. Specific regulations and their applicability are reviewed below. For all applicable regulations, Tennessee submitted state permit applications in 2016.

Permits by Rule

The emissions associated with the construction and operation of Compressor Stations 3A and 11A would be authorized under Title 30 of the TAC, Part 106.352 (Permits by Rule [PBR] for Oil and Gas Handling and Production Facilities), 30 TAC 106.511 (PBR for Portable and Emergency Engines and Turbines), 30 TAC 106.512 (PBR for Stationary Engines and Turbines), and 30 TAC 106.350 (Planned Maintenance, Startup, and Shutdown at Oil and Gas Handling and Production Facilities).

Control of Air Pollution from Visible Emissions and Particulate Matter

Visible emissions and particulate matter are regulated by 30 TAC 111. The rule provides opacity standards for all stationary vents, and vents at Compressor Stations 3A

and 11A are subject to this rule. Because the equipment would be fueled by natural gas, and it is a relatively clean-burning fuel, the Project would meet the requirements of the rule.

Control of Air Pollution from Volatile Organic Compounds

Storage of VOCs is regulated by 30 TAC 115 if the storage tank is located in specific areas and if the storage capacity is greater than 420,000 gallons. The storage tank at Compressor Station 3A would be a 7,000-gallon tank and the applicable regulations would therefore not apply. Jackson County is not located in an area regulated by this control, and therefore Compressor Station 11A is not subject to this rule.

2.2 CONSTRUCTION EMISSIONS IMPACTS AND MITIGATION

Project construction would result in temporary, localized emissions that would last the duration of construction activities (i.e., 10 months). Exhaust emissions would be generated by the use of heavy equipment and trucks powered by diesel or gasoline engines. Exhaust emissions would also be generated by delivery vehicles and construction workers commuting to and from work areas.

Construction activities would also result in the temporary generation of fugitive dust due to land clearing and grading, ground excavation, and driving on unpaved roads. The amount of dust generated would be a function of construction activity, soil type, soil moisture content, wind speed, precipitation, vehicle traffic and types, and roadway characteristics. Emissions would be greater during dry periods and in areas of fine-textured soils subject to surface activity.

Construction emissions were estimated based on the fuel type and anticipated frequency, duration, capacity, and levels of use of various types of construction equipment. Construction emissions were estimated using emission factors provided in AP-42 data (EPA 2016b), the California Air Resource Board's Off-Road Model, and California's South Coast Air Quality Management District's EMFAC 2007 (v2.3). Table 4 below provides the total Project construction emissions, including exhaust emissions and fugitive dust from on-road and off-road construction equipment and vehicles, exhaust emissions from construction worker vehicles for commuting and vehicles used to deliver equipment/materials to the site, and painting and welding fumes.

Table 4								
Potential Construction Emissions for the Project (tons per year)								
Activity	NO_x	CO	VOC	PM₁₀	PM_{2.5}	SO₂	Total HAPS	CO_{2e}
Compressor Station 3A								
Site Preparation and unpaved haul road traffic	-	-	-	0.16	0.17	-	-	-
Painting and Welding	-	-	0.42	0.03	0.03	-	0.004	-
Heavy equipment and on-road vehicles	4.81	6.16	1.01	0.23	0.19	0.02	0.05	1,369.52
Total ¹	4.81	6.16	1.43	0.42	0.38	0.02	0.06	1,369.52
Compressor Station 11A								
Site Preparation and unpaved haul road traffic	-	-	-	0.16	0.17	-	-	-
Painting and Welding	-	-	0.42	0.03	0.03	-	0.004	-
Heavy equipment and on-road vehicles	4.81	6.16	1.01	0.23	0.19	0.02	0.05	1,369.52
Total ¹	4.81	6.16	1.43	0.42	0.38	0.02	0.06	1,369.52
- no applicable emissions generated								
¹ rows may not sum to total due to rounding								

Construction emissions shown in table 4 are not expected to result in a violation or degradation of ambient air quality standards. Tennessee would minimize construction exhaust emissions by operating equipment on an as-needed basis and maintaining equipment and vehicles in accordance with manufacturers' specifications and EPA emission standards. In order to mitigate and minimize fugitive dust, Tennessee would implement measures contained in the Dust Control Plan,¹⁸ such as enforced speed limits, water application on access roads, and construction entrances that would minimize dirt track out. We have reviewed the Dust Control Plan and find it acceptable. In addition, unpaved access roads would be paved shortly after commencing construction, which would minimize fugitive dust.

Construction emissions would occur over the duration of construction activity and would be emitted at different times and locations throughout the Project area. Construction emissions would be minor and would result in short-term, localized impacts in the immediate vicinity of Compressor Stations 3A and 11A. With the mitigation measures proposed by Tennessee, we conclude air quality impacts from construction would be temporary and should not result in significant impact on local or regional air quality.

¹⁸ The Dust Control Plan is available on FERC's "eLibrary" link under the accession number 20161219-5403 (available in Attachment 9-1).

2.2 OPERATIONAL EMISSIONS IMPACTS AND MITIGATION

The Project would generate air emissions during operation of Compressor Stations 3A and 11A. Emission-generating equipment from Compressor Station 3A would primarily consist of the following:

- one 10,915-hp ISO rated Solar Taurus 70 turbine/compressor unit;
- emergency natural gas engine (1,006-hp);
- natural gas heater with a 4.6 MBTU per hour rating; and
- double walled condensate storage tanks.

Emission-generating equipment at Compressor Station 11A would primarily consist of the following:

- one 20,500-hp ISO rated Solar Taurus 130 turbine/compressor unit;
- emergency natural gas engine (1,006-hp);
- natural gas heater with a 4.6 MBTU per hour rating; and
- double walled condensate storage tanks.

Table 5 provides the annual potential to emit at Compressor Stations 3A and 11A. These estimated emissions are based on manufacturers' data, and assumptions that the station turbines operate at full load for an entire year (i.e., 8,760 hours per year). Compressor Stations 3A and 11A would not likely operate at full load every day; therefore, table 5 provides conservative, worst-case estimates of emissions.

Table 5								
Potential Operational Emissions for the Project (tons per year)								
Activity	NO_x	CO	VOC	PM₁₀	PM_{2.5}	SO₂	Total HAPS	CO_{2e}
Compressor Station 3A								
Turbine Emissions	23.61	40.43	0.97	1.62	0.65	0.18	0.25	37,964.05
Emergency Generator	0.22	0.44	0.13	-	-	0.0002	0.02	52.35
Fugitive Emissions	-	-	0.65	-	-	-	-	265.51
Heater Emissions	1.93	1.62	0.11	0.15	0.11	0.01	-	2,329.62
Flashing, Working, and Breathing Losses	-	-	0.00	-	-	-	-	1.82
Truck loading and hauling emissions	-	-	0.002	0.001	-	-	-	0.02
MSS- Blowdowns and Default			1.78	-	-	-	-	430.68
Total ¹	25.76	42.49	3.64	1.77	0.76	0.19	0.27	41,044.05
Compressor Station 11A								
Turbine Emissions	43.45	72.93	1.77	2.96	1.2	0.17	0.46	69,520.84
Emergency Generator	0.22	0.44	0.13	-	-	0.0002	0.02	52.35
Fugitive Emissions	-	-	0.65	-	-	-	-	265.51
Heater Emissions	1.93	1.62	0.11	0.15	0.11	0.01	-	2329.62
Flashing, Working, and Breathing Losses	-	-	0.00	-	-	-	-	2.11
Truck loading and hauling emissions	-	-	0.002	0.001	-	-	-	0.03
MSS- Blowdowns and Default			1.78	-	-	-	-	430.68
Total ¹	45.60	74.99	4.45	3.11	1.31	0.18	0.48	72,601.14
Permitting Thresholds (tons per year)								
<i>PSD Major Source</i>	250	250	250	<i>n/a</i>	<i>n/a</i>	250	<i>n/a</i>	100,000
<i>Title V Major Source</i>	100	100	100	<i>n/a</i>	<i>n/a</i>	100	25	100,000
<i>Texas Permit</i>	<250	<250	<25	<15	<10	<25	<25	<i>n/a</i>
- no applicable or significant emissions generated								
¹ rows may not sum to total due to rounding								

Compressor unit blowdowns (gas venting) can occur during initial construction/testing, operational startup and shutdown, maintenance activities, and during emergency purposes. Emission estimates of compressor unit blowdowns are provided in table 5. During construction and testing of the station, there is an increased frequency of blowdowns to ensure the facility would be operated reliably and safely. During normal operations, blowdowns during compressor startup/shutdown would be infrequent as normal operation does not require venting and units are pressurized to facilitate operation; however, occasional maintenance and startup/shutdown blowdowns can occur.

Fugitive emissions are minor leaks that would occur at valves, seals, and other piping components, and from operation and maintenance activities at Compressor Stations 3A and 11A. Emission estimates of fugitive gases are provided in table 5. In order to minimize fugitive emissions, Tennessee would maintain turbine combustion efficiency by following manufacturer's recommendations for scheduled maintenance and would test and repair pressure safety valves regularly. Tennessee would also be required to comply with EPA's 40 CFR 98, Subpart W and with 40 CFR 60, Subpart OOOOa standards, which both require leak detection and repair programs. Further, Tennessee is a member of the EPA Natural Gas STAR program to share best practices for reducing methane emissions. Fugitive methane emissions are a source of GHG emissions from the proposed Project.

In addition to complying with all applicable air permits, Tennessee would mitigate the impacts of operational emissions through installation of "SoLoNox" lean-premixed combustion technology. This technology lowers the maximum flame temperatures, ensuring uniform air/fuel mixture that reduces the formation of NO_x, CO, and unburned hydrocarbons. Tennessee would also limit the hours of operation of emergency equipment to only periods of testing and emergencies.

Air Quality Modeling

An air quality screening model was completed to determine the impacts of emissions from Compressor Stations 3A and 11A on regional air quality. The analysis was conducted using the EPA SCREEN3 model (screening model) and the maximum emission rates for the pollutants. The analysis also assumed that the facilities would be running at full capacity (i.e., 8,760 hours per year at maximum load). The screening model estimates the maximum predicted concentrations of criteria pollutants emitted from the compressor stations using conservative assumptions. Background concentrations from the nearest air monitors were then added to the maximum predicted concentrations from the screening models and the total was compared to the NAAQS. The screening model results are provided below in table 6.

Table 6 Predicted Air Quality Impacts						
Pollutant	Averaging Period	Existing Background	Maximum Modeled Concentration	Combined Background and Maximum Modeled	NAAQS	Units
Compressor Station 3A						
CO	1-hour	2.83	0.08	2.91	35	ppm
	8-hour	1.50	0.05	1.55	9	ppm
NO ₂	1-hour	33.00	30.23	63.23	100	ppb
	Annual	4.01	2.42	6.43	53	ppb
PM _{2.5}	24-Hour	22.67	1.19	23.86	35	µg/m ³
	Annual	9.20	0.24	9.44	12	µg/m ³
PM ₁₀	24-Hour	57.33	1.65	58.98	150	µg/m ³
	Annual	57.33	0.33	57.66	-	µg/m ³
SO ₂	1-Hour	4.00	0.20	4.20	75	ppb
	3-hour	4.00	0.18	4.18	500	ppb
	24-Hour	1.67	0.0001	1.67	-	ppm
	Annual	4.00	0.02	4.02	-	ppb
Compressor Station 11A						
CO	1-hour	1.57	0.08	1.65	35	ppm
	8-hour	1	0.05	1.12	9	ppm
NO ₂	1-hour	42	30.54	72.54	100	ppb
	Annual	7.04	2.44	9.48	53	ppb
PM _{2.5}	24-Hour	22.33	1.19	23.52	35	µg/m ³
	Annual	11.63	0.24	11.87	12	µg/m ³
PM ₁₀	24-Hour	101.33	1.67	103.00	150	µg/m ³
	Annual	101.33	0.33	101.66	-	µg/m ³
SO ₂	1-Hour	15.67	0.19	15.86	75	ppb
	3-hour	15.67	0.17	15.84	500	ppb
	24-Hour	4.3	0.0001	4.30	-	ppm
	Annual	15.67	0.02	15.69	-	ppb
µg/m ³ = micrograms per cubic meter ppb = parts per billion ppm = parts per million ¹ An average 3-year value (2013, 2014, 2015) was used for background values from most proximate monitor						

The results in table 6 indicate that the combined total of background and maximum modeled concentrations are less than the applicable NAAQS for all pollutants. Therefore, the Project would not cause or significantly contribute to a degradation of ambient air quality. The Project would result in continued compliance with the NAAQS, which are established to be protective of human health, including sensitive populations such as children, the elderly, and asthmatics.

We received about 10 comments from residents of Edna and Sinton, Texas who were concerned with air quality in the vicinity of Compressor Stations 3A and 11A. Analysis of the natural gas in Tennessee's existing system indicated that the gas is approximately 90 percent methane. When combusted, methane forms carbon dioxide and water vapor, comprising the majority of Compressor Station 3A and 11A emissions. The CO₂ emissions, combustion-related emissions, including NO_x and CO, and the emissions associated with the remaining 10 percent of natural gas composition are shown in table 5. The majority of emissions from the compressor stations, other than CO₂ and water vapor, would be CO and NO_x. VOCs and HAPs would also be emitted at a much smaller volume (about one to two orders of magnitude less). With the exception of CO₂e, all of the compounds identified in table 5 have known health impacts, and are therefore regulated by the EPA through the CAA. However, the results of the screening modeling (see table 6) indicate that the maximum-predicted emissions from Compressor Stations 3A and 11A would not result in a significant degradation of air quality and would not exceed the NAAQS, established by the EPA to be protective of human health. Therefore, we conclude that impacts on air quality from the proposed Project would not be significant.

Blowdown events also release emissions; however, they were not included in the screening modeling based on EPA's modeling guidance because these events are short-term and infrequent, and they are not expected to result in significant impacts on air quality.

2. NOISE AND VIBRATION

Noise is generally defined as sound with intensity greater than the ambient or background sound pressure level. Construction and operation of the Project would affect overall noise levels in the Project area. The magnitude and frequency of environmental noise may vary considerably over the course of the day, throughout the week, and across seasons, in part due to changing weather conditions and the effects of seasonal vegetative cover. Two measures that relate the time-varying quality of environmental noise to its known effect on people are the 24-hour equivalent sound level (L_{eq}) and day-night sound level (L_{dn}). The L_{eq} is an A-weighted sound level containing the same energy as the instantaneous sound levels measured over a specific time period. Noise levels are perceived differently, depending on length of exposure and time of day. The L_{dn} takes into account the duration and time the noise is encountered. Specifically, the L_{dn} is the L_{eq} plus a 10 decibel on the A-weighted scale (dBA) penalty added to account for people's greater sensitivity to nighttime sound levels (typically considered between the hours of 10:00 p.m. and 7:00 a.m.). The A-weighted scale is used to assess noise impacts because human hearing is less sensitive to low and high frequencies than mid-range frequencies. The human ear's threshold of perception for noise change is considered to be 3 dBA; 5 dBA is clearly noticeable to the human ear, and 10 dBA is perceived as a doubling of noise (Bies and Hansen 1988).

10. FEDERAL NOISE REGULATIONS

In 1974, the EPA published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* (EPA 1974). This document provides information for state and local governments to use in developing their own ambient noise standards. The EPA has indicated that an L_{dn} of 55 dBA protects the public from indoor and outdoor activity interference. We have adopted this criterion and use it to evaluate the potential noise impacts from the proposed Project at noise sensitive areas (NSAs). NSAs are defined as homes, schools, churches, or any location where people reside or gather. FERC requires that the noise attributable to any new compressor engine or modifications during full load operation not exceed an L_{dn} of 55 dBA at any NSAs. Due to the 10 dBA nighttime penalty added prior to the calculation of the L_{dn} , for a facility to meet the 55 dBA L_{dn} limit, it must be designed such that actual constant noise levels on a 24-hour basis do not exceed 48.6 dBA L_{eq} at any NSA.

No other applicable state or local noise regulations were identified for the Project (City of Sinton 1996a, 1996b; City of Edna 2016).

2.2 AGRICULTURAL/RANGELAND

Land use in the vicinity of the proposed Compressor Stations 3A and 11A consist mainly of agricultural/rangeland or forest/woodland. The four closest NSAs (or cluster of NSAs) in each direction at each compressor station were identified and included in the noise assessment. Ambient noise surveys at the NSAs nearest to the proposed Compressor Station 3A were completed on May 17 and 18, 2016. Ambient noise surveys at the NSAs nearest to the proposed Compressor Station 11A were completed on May 17, 18, 26 and 27, 2016. Day and night data were collected at all NSAs. The results of the noise surveys are provided in table 7 as ambient background sound levels.

2.2 CONSTRUCTION NOISE IMPACTS AND MITIGATION

Noise would be generated during construction of the Project. Construction activities in any one area could last from several weeks to several months on an intermittent basis. While individuals in the immediate vicinity of the construction activities would experience an increase in noise, this effect would be temporary and local. Noise mitigation measures that would be employed during construction include ensuring that sound muffling devices, which are provided as standard equipment by the construction equipment manufacturer, are kept in good working order. If needed, additional noise abatement techniques and other measures could be implemented during the construction phase to mitigate construction noise disturbances at NSAs. Nighttime noise is not expected to increase during construction because construction activities would be limited to daytime hours, with the exception of specialized construction activities and/or weather-related events.

2.2 OPERATION NOISE IMPACTS AND MITIGATION

The proposed compressor stations would generate noise on a continuous basis (i.e., up to 24 hours per day) when operating. The noise impact associated with the compressor stations would attenuate with distance from the compressor stations. Noise generated at each compressor station would be from the following operational noise sources:

- turbine exhaust;
- turbine intake;
- turbine/compressor unit;
- lube oil cooler;
- discharge gas cooler; and
- aboveground piping.

The results of the ambient noise survey were combined with the predicted noise impacts from the proposed compressor station equipment to determine the noise impacts from operation of the compressor stations at each NSA. The noise survey also incorporates noise control measures for operational noise. Noise control measures at each compressor station include exhaust silencers; inlet silencers; noise reducing lube oil cooler (at Compressor Station 11A); structural support bearing pads for piping isolation; insulated roll-up equipment doors; wall and roof system; and ventilation silencers with lined hoods. The results of the operational noise analysis are provided below in table 7.

Table 7 Noise Analysis for the Project						
NSA	Type	Distance and Direction from Facility	Ambient Background Sound Levels (L_{dn} dBA)	Predicted Sound Level Contribution from Station (L_{dn} dBA)	Predicted Total Sound Level (L_{dn} dBA)	Predicted Change in L_{dn} from Existing Ambient (dBA)
Compressor Station 3A						
NSA 1	Residence	2,350 feet southwest	54.6	46.5	55.2	0.6
NSA 2	Residence	2,300 feet north-northwest	50.9	45.8	52.1	1.2
NSA 3	Residence	2,670 feet east-southeast	55	42	55.2	0.2
NSA 4	Residence	3,180 feet south-southwest	48.5	41.6	49.3	0.8
Compressor Station 11A						
NSA 1	Residence	1,360 feet southeast	55.2	49.5	56.2	1
NSA 2	Residence	3,260 feet northeast	54.1	42.1	54.4	0.3
NSA 3	Residence	2,550 feet north	51.2	44.9	52.1	0.9
NSA 4	Residence	3,380 feet southwest	52.5	41.5	52.9	0.4

The operational noise analysis in table 7 indicates that total noise at two NSAs will be greater than 55 dBA, however the contribution from Compressor Stations 3A and 11A (excluding background noise) would not exceed 55 dBA L_{eq} at any NSA. Additionally, because the predicted change in sound levels at the NSAs are less than 3 dBA, the compressor stations would not result in a perceptible sound level increase during normal operation (Bies and Hansen 1988).

Blowdown events generate noise at compressor stations and occur when pressure in the compressor casing, piping, or the entire station must be released in a controlled manner. Blowdown events cause a temporary increase in sound levels that would typically last for about 3 minutes. Because of the short duration and infrequent occurrence, blowdown event sound levels were compared against the average background nighttime sound levels at each NSA to determine the short-term impact. Noise control measures for each compressor station include unit blowdown silencers. The result of the blowdown noise analysis are provided in table 8.

Table 8 Blowdown Noise Analysis for the Project						
NSA	Type	Distance and Direction from Facility	Ambient Background Night Sound Levels (dBA)	Predicted Sound Level Contribution from Blowdown (Leq dBA)	Predicted Total Sound Level (Leq dBA)	Predicted Short-term Impact During Blowdown (Leq dBA)
Compressor Station 3A						
NSA 1	Residence	2,350 feet southwest	47.4	53	54.1	6.7
NSA 2	Residence	2,300 feet north-northwest	43.2	53.5	53.9	10.7
NSA 3	Residence	2,670 feet east-southeast	47.9	54.9	55.7	7.8
NSA 4	Residence	3,180 feet south-southwest	41.8	50.3	50.9	9.1
Compressor Station 11A						
NSA 1	Residence	1,360 feet southeast	47.9	54.2	55.1	7.2
NSA 2	Residence	3,260 feet northeast	47.1	44.6	49.1	2.0
NSA 3	Residence	2,550 feet north	42.4	49.3	50.1	7.7
NSA 4	Residence	3,380 feet southwest	46.5	45.7	49.1	2.6

Blowdown events would result in short-term increases in noise levels at the NSAs. Given the non-routine nature and short-term duration of these blowdown events, we do not believe that these would be a significant contributor to operational noise from the Project.

Emergency shutdowns can also generate significant noise levels at compressor stations and occur during emergencies when the gas from all station piping is released in a controlled manner. Because these events are extremely rare and only occur in the event of an emergency or when the system is tested every few years, they do not contribute to operational noise and thus would not result in significant noise impacts on local residents.

While the analysis above shows that noise impacts at the NSAs from the compressor stations would be below our 55 dBA requirement, to verify compliance with the FERC's noise standards, **we recommend that:**

Tennessee should file with the Secretary noise surveys for Compressor Stations 3A and 11A no later than 60 days after placing each station into service. If a full power load condition noise survey is not possible, Tennessee should file an

interim survey at the maximum possible power load within 60 days of placing the station into service and file the full power load survey within 6 months. If the noise attributable to operation of all equipment at the station under interim or full power load conditions exceeds an L_{dn} of 55 dBA at any nearby NSA, Tennessee should:

- a. file a report with the Secretary, for review and written approval by the Director of OEP, on what changes are needed;**
- b. install additional noise controls to meet that level within 1 year of the in-service date; and**
- c. confirm compliance with this requirement by filing a second full power load noise survey with the Secretary for review and written approval by the Director of OEP no later than 60 days after it installs the additional noise controls.**

We received comments from the public concerned about noise impacts from the proposed Compressor Stations 3A and 11A. Operation of Compressor Stations 3A and 11A would contribute to noise impacts within one mile of the Project. Predicted impacts on noise levels would range from 0.2 dBA to 1.2 dBA at nearby NSAs. While existing noise levels would be impacted by operation of Compressor Stations 3A and 11A, based on our analyses, sound mitigation measures proposed, and the condition stated above, we believe that the Project would not result in significant noise impacts on residents or the surrounding communities.

2.2 WETLANDS

We received comments from the public concerned about vibration and the impact of vibration on water wells in the vicinity. In addition to noise requirements, the Commission requires that operation of compressor stations not result in any perceptible increase in vibration. Due to the high rotating speed of the gas turbine engine, any imbalances significant enough to cause a perceptible level of ground-borne vibration would result in equipment damage and station shutdown. In addition, the proposed configuration of the compressor station would not produce pulsating gas flow at levels significant enough to induce vibration in the associated piping systems. While turbines, in rare instances, have been known to cause noise-induced vibration, due to the significant distances between the compressor stations and the NSAs, we do not anticipate vibration effects. Therefore, we do not expect the Project would result in any perceptible ground-born vibration to nearby residents/NSAs. If operation of Compressor Stations 3A and 11A results in perceptible vibration, the Commission would require Tennessee to investigate the cause and could require mitigation to reduce the vibration.

10. RELIABILITY AND SAFETY

The transportation of natural gas by pipeline involves some incremental risk to the public due to the potential for accidental release of natural gas. The greatest hazard is a fire or explosion following a major pipeline rupture.

Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is not toxic, but is classified as a simple asphyxiate, possessing a slight inhalation hazard. If breathed in high concentration, oxygen deficiency can result in serious injury or death. Methane has an auto-ignition temperature of 1,000° F and is flammable at concentrations between 5 percent and 15 percent in air. An unconfined mixture of methane and air is not explosive; however, it may ignite and burn if there is an ignition source. A flammable concentration within an enclosed space in the presence of an ignition source can explode. It is buoyant at atmospheric temperatures and disperses rapidly in air.

The DOT is mandated to prescribe minimum safety standards to protect against risks posed by pipeline facilities under Title 49, CFR 192. The DOT's Pipeline and Hazardous Materials Safety Administration administers the national regulatory program to ensure the safe transportation of natural gas and other hazardous materials by pipeline. It develops safety regulations and other approaches to risk management that ensure safety in the design, construction, testing, operation, maintenance, repair, and emergency response of pipeline facilities. DOT's Pipeline and Hazardous Materials Safety Administration's safety mission is to ensure that people and the environment are protected from the risk of pipeline incidents.

Many commenters expressed concern about the safety of Tennessee's existing 100 Line due to the pipeline's age. FERC's regulations require that an applicant (i.e., Tennessee) certify that it would design, install, inspect, test, construct, operate, replace, repair, and maintain the facility for which a Certificate is requested in accordance with federal safety standards and plans for maintenance and inspection. DOT pipeline standards, published in Parts 190-199 of Title 49 of the CFR, specifically address natural gas pipeline safety issues, including requirements to upgrade pipeline facilities, as necessary, to comply with pipe class location requirements; material selection, qualification, and minimum design requirements; and maintenance for existing pipelines to ensure they are properly protected from external, internal, and atmospheric corrosion. DOT regulations also specify requirements for the integrity management of a pipeline. Tennessee must ensure the integrity of its existing 100 Line is sufficient to meet the operating pressures of the 100 Line if the proposed Project is constructed.

Part 192 of 49 CFR also prescribes the minimum standards for operating and maintaining pipeline facilities, and incorporates compressor station design, including emergency shutdowns and safety equipment. The Project must be designed, constructed, operated, and maintained in accordance with the DOT's Minimum Federal Safety

Standards in 49 CFR 192. The regulations are intended to ensure adequate protection for the public and to prevent natural gas facility accidents and failures.

Part 192 also requires a pipeline operator to establish a written emergency plan that includes procedures for emergency shutdowns to minimize the hazards in a natural gas pipeline emergency. Tennessee would provide the appropriate training to local emergency service personnel before the facilities are placed in service. Tennessee must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and report it to appropriate public officials.

The Project's construction and operation would represent a minimum increase in risk to the public; however, we are confident that with continued compliance with DOT safety standards, operation, and maintenance requirements, the Project would be constructed and operated safely.

10. CUMULATIVE IMPACTS

In accordance with NEPA and with FERC policy, we evaluated the potential for cumulative effects of the Project. Cumulative impacts represent the incremental effects of a proposed action when added to other past, present, or reasonably foreseeable future actions, regardless of the agency or party undertaking such other actions. Cumulative impacts can result from individually minor, but collectively significant actions, taking place over time.

This cumulative effects analysis generally follows a method set forth in relevant CEQ and EPA guidance and focuses on potential impacts from the proposed Project on resource areas or issues where the incremental contribution would be potentially significant when added to the potential impacts of other actions. To avoid unnecessary discussions of insignificant impacts and projects and to adequately address and accomplish the purposes of this analysis, an action must first meet the following three criteria to be included in the cumulative analysis:

- affect a resource potentially affected by the Project;
- cause this impact within all, or part of, the Project area; and
- cause this impact within all, or part of, the time span for the potential impact from the Project.

11.1 PROJECTS IDENTIFIED WITHIN THE GEOGRAPHIC SCOPE

Our cumulative impacts analysis considers actions that impact environmental resources affected by the proposed action, within all or part of the Project area affected by the proposed action (i.e., geographic scope), and within all or part of the time span of the impacts. The geographic scope used to assess cumulative impacts for each resource

are discussed below in table 9. The projects considered in the cumulative impacts analysis are provided in table 10.

Resource	Geographic Scope
Geological Resources and Soils	Limits of project disturbance
Water Resources	Watershed boundary (HUC-12)
Vegetation, Wildlife, and Special Status Species	HUC-12
Land Use, Recreation, and Visual Resources	1 mile
Socioeconomics	County
Cultural Resources	Limits of project disturbance
Air Quality	Construction: 0.25 mile; Operation: 50 km
Noise	1 mile

- Project construction and restoration measures, including erosion control devices, are designed to confine impacts on geologic and soil resources to the project workspaces. Therefore, we evaluated potential cumulative impacts on soils and geological resources within the same construction footprint as the Project.
- Impacts on water resources (primarily increased turbidity) and wetlands could extend outside of the workspaces, but would also be contained to a relatively small area. Furthermore, impacts on water resources are traditionally assessed on a watershed level. Therefore, we evaluated other projects within the HUC-12 watersheds crossed by the Project.
- Impacts on vegetation, wildlife, and special status species could extend outside of the workspaces to plant seed dispersion areas or individual home ranges for species with potential to occur in the Project area, but would generally be contained to a relatively small area. We believe the watershed scale is most appropriate to evaluate impacts as it provides a natural boundary and a geographic proxy to accommodate general wildlife habitat and ecology characteristics in the Project area. Therefore, we evaluated projects within the HUC-12 watersheds crosses by the Project.
- Impacts on socioeconomic conditions could include entire counties, as demographic statistics are generally assessed on a county basis.
- Impacts on cultural resources are highly localized and generally confined to the historic property or resource that is affected. Therefore, the geographic scope for cultural resources impacts is limited to the project footprint,

encompassing any overlapping effects to cultural resources and historic properties.

- Temporary impacts on air quality, including fugitive dust, would be largely limited to areas within 0.25 mile of active construction. Long-term impacts on air quality would be largely contained within an approximate 50-km radius of the compressor stations. We evaluated current and proposed sources within 50 km. Tennessee also completed additional modeling for proposed emission sources within 15 km of the compressor stations.
- Impacts from construction and operation noise could potentially contribute to cumulative impact on NSAs within 1 mile of the compressor stations. Therefore, we evaluated current and proposed sources within 1 mile of the compressor stations.

An evaluation was performed to identify past, present, and reasonably foreseeable future projects within the resource-specific geographic scopes. Tennessee obtained information about present and future planned developments. Tennessee consulted sources including federal, state, and local agency and municipality websites, reports, and direct communications; permit applications with various agencies; and online database searches. The projects identified as occurring within the resource-specific geographic scopes are identified below based on resource type.

11.1 POTENTIAL CUMULATIVE IMPACTS OF THE PROPOSED ACTION

As described in section B of this EA, Project-related construction and operation would temporarily and permanently impact the environment. The Project would impact geology and soils; water resources; vegetation and wildlife; socioeconomics; land use and visual resources; and air quality and noise. Table 10 below lists the past, present, and reasonably foreseeable projects identified within the geographic scope for each resource and considered for cumulative impact analysis.

Table 10 Present and Reasonably Foreseeable Projects Considered for Cumulative Impacts within the Geographic Scope of the Project				
Project Type/Name¹	Location	Project Description	Project Status	Potential Contribution to Cumulative Impacts
Projects Occurring Within the Same Geographic Scope as Compressor Station 3A				
CCCP and the Sinton and Taft Compressor Station	5 miles east of CS 3A	23-mile-long natural gas pipeline linked to CCL Terminal	Construction planned in 2017, expansion planned in 2018	Socioeconomics, Air Quality
CCL Terminal	21 miles southeast of CS 3A	LNG facility increased capacity	Construction from 2015 - 2021	Socioeconomics
Oxychem Ingleside Plant	22 miles southeast of CS 3A	Construction of a new ethylene plant	Air permit pending	Socioeconomics
Current Projects Occurring Within the Same Timeframe and Geographic Scope as Compressor Station 3A				
Portilla Gas Plant	7 miles	Natural gas liquids plant	Existing Facility	Air Quality
Welder Tank Battery	7 miles	Crude petroleum and natural gas facility	Existing Facility	Air Quality
Projects Occurring Within the Same Geographic Scope as Compressor Station 11A				
Jackson County Generating Facility	12 miles northeast of CS 11A	Power generation facility	Air permit pending	Socioeconomics
Current Projects Occurring Within the Same Timeframe and Geographic Scope as Compressor Station 11A				
Edna Compressor Station	6 miles	Natural gas transmission facility	Existing Facility	Air Quality
CCCP = Cheniere Corpus Christi Pipeline, LP CCL = Corpus Christi Liquefaction, LLC ¹ Inclusive of all emission sources identified within 15 km of the Project. A complete list of all sources within 50 km is available on FERC's "eLibrary" link under the accession number 20160819-5293 (available in table 1-7 of Resource Report 1).				

As indicated in table 10, there are no projects within the geographic scope of the Project for the following resources: geology, soils, water resources, vegetation, wildlife, fisheries and special status species, land use, recreation, visual resources, noise, and cultural resources. Therefore, we conclude that the impacts from this Project, when considered cumulatively with past, present, and reasonably foreseeable projects, would not contribute to significant cumulative impacts on these resources, and these resources will not be discussed further in this section. The only two resources with potential for the Project to contribute to overall cumulative impacts, socioeconomics and air quality, are considered below.

Socioeconomics

Project-related impacts on population and housing are expected to be negligible with the addition of 145 temporary workers (at peak construction) and only 1 permanent employee during operations at each compressor station. Only one nearby project, the Cheniere Corpus Christi Pipeline, LP (CCCP), and two associated compressor stations (located within 5 miles of proposed Compressor Station 3A), are planned for construction

at the same time as Tennessee's proposed Project. Construction of these facilities would require an estimated 300 workers during construction and 6 permanent employees during operations. There are approximately 1,115 and 270 rental units in San Patricio and Jackson Counties, respectively, which is more than sufficient to accommodate the temporary workers associated with these two projects. There are also additional rental units available in nearby cities, including Corpus Christi and Matagorda County, Texas. Together, the projects listed in table 10 would have a cumulative impact on population and housing in the area with the addition of temporary and permanent employees. The Project would contribute negligibly to these overall cumulative impacts on population and housing. Increased commercial and industrial development within the counties has the potential to generate additional short- and long-term employment opportunities, thereby having a net positive impact. The Project would contribute negligibly to overall beneficial cumulative impacts on employment.

Impacts on public services are largely a function of population. As previously mentioned, the Project would add 145 temporary workers at peak construction and only 1 permanent employee during operations at each compressor station. Project-related impacts on local government public services are expected to be negligible. Collectively, the projects described in table 10 would have cumulative impacts on public services in the project area through the addition of temporary and permanent employees, as described above. However, these communities have the local public services to accommodate these projects. In addition, Tennessee has agreed to work with these localities to ensure Project safety, and we expect the other project proponents are likely doing the same.

Project-related impacts on traffic and transportation would be temporary and short-term, lasting only for the duration of construction activities. Tennessee proposed to minimize disruptions to normal traffic flows through scheduling, signage, and carpooling, as well as any highway use permit conditions. Cumulative traffic impacts could occur if several large-scale projects are constructed concurrently and use the same local roadway network to access their respective sites. However, although the CCCP project and two associated compressor stations (located within 5 miles of Compressor Station 3A) are planned for construction at the same time as the proposed Project, the projects would not likely use the same local roadway network. The remaining projects would be greater than 10 miles from Tennessee's Project. These existing and proposed projects are not likely to contribute to cumulative traffic impacts associated with the Project based on the large distances between the projects.

The Project would not have a disproportionately high or adverse human health, socioeconomic, or other environmental effect on minority or low-income communities; therefore, it would not contribute to overall cumulative impacts on environmental justice communities.

Air Quality

Construction of reasonably foreseeable current and future projects and activities within the geographic scope that may impact air quality are described below. Operation of Compressor Stations 3A and 11A would contribute cumulatively to air quality impacts in the region.

There are no projects listed in table 10 that are within 0.25 mile of the proposed Project. Therefore, there would not be any cumulative construction air impacts and these are not discussed further.

The operation of Compressor Stations 3A and 11A would be a source of air emissions and minor fugitive equipment leaks and would impact air quality. A geographic scope of 50 km was used to qualitatively evaluate cumulative impacts on air quality. There are a significant number of emissions sources, especially oil- and gas-related sources, within 50 km of the Project. However, the majority of emissions sources are at least 20 miles (32 km) away. Based on the results of the air quality screening from Compressor Stations 3A and 11A (see section B.8.5), predicted maximum impacts of all pollutants would not exceed the significant impact level (SIL), with the exception of NO₂. The SIL is used to determine if a source contributes significantly to air quality degradation and requires additional analysis using a refined air quality model. At a distance of 9.3 miles (15 km) from both Compressor Stations 3A and 11A, the impact of NO₂ is below the SIL. In other words, beyond 9.3 miles, emissions of NO₂ are expected to disperse significantly with ambient air, minimizing the potential for cumulative impacts. All other pollutants were present at concentrations that are below the SIL and are not considered significant. Therefore, our analysis focused on the comprehensive assessment of cumulative impacts on air quality within 9.3 miles of the Project, and impacts from projects further than this were considered de minimis.

Table 10 lists the projects occurring within a 9.3 mile radius of each compressor station that may contribute cumulatively to air quality impacts. The Portilla Gas Plant and the Welder Tank Battery Plant are two existing sources within this radius. Both of these sources are currently operating under existing permits and were included in the background (i.e., existing) air quality data that was used to model predicted impacts on air quality. Air quality screening (see section B.8.5) indicates that air quality impacts from the compressor stations in addition to the background would continue to be below the NAAQS.

There is one existing project (i.e., Edna Compressor Station) within 9.3 miles of Compressor Station 11A, and no future projects planned within 9.3 miles of Compressor Station 11A. The only future planned project in table 10 within the geographic scope of Compressor Station 3A is the Sinton Compressor Station about 5 miles away. The Sinton

Compressor Station project is not included in the background data because it is not yet operational; therefore, the NO₂ air quality impacts from the planned Sinton Compressor Station were modeled using the EPA's refined modeling software (AERMOD) to determine the cumulative impacts on air quality. The model indicated that the predicted emissions of Compressor Station 3A and the Sinton Compressor Station combined, in addition to the background values (i.e., existing conditions), would continue to be below the NAAQS and would therefore remain protective of human health. The modeling results are provided in table 11.

Pollutant	Averaging Period	Projects Maximum Impact (ppb)	Background Monitor Concentration (ppb)	Total Maximum Impact (ppb)	NAAQS (ppb)
NO ₂	1-hour	36.66	33	69.66	100
	Annual	5.49	4.01	9.5	53

Based on the results of the screening and refined modeling, emissions from the Project, current and planned future sources would not result in degraded air quality and would not contribute to an exceedance of the NAAQS. We conclude that there would not be a significant cumulative impact on air quality.

C. VISUAL RESOURCES

In accordance with NEPA and Commission policy, we evaluated alternatives to the Project to determine whether they would be reasonable and environmentally preferable to the proposed action. These alternatives included the no-action alternative, system alternatives, and site alternatives. The evaluation criteria used for developing and reviewing alternatives were:

- technical and economic feasibility and practicality;
- significant environmental advantage over the proposed action; and
- ability to meet the Project's stated objective.

1. NO-ACTION ALTERNATIVE

Under the no-action alternative, Tennessee would not construct or operate Compressor Stations 3A or 11A and none of the impacts associated with the Project would occur. However, the Project objectives would not be met. Tennessee would not be able to meet the Project shipper's stated need to transport 300 million cubic feet per day of natural gas. Firm transportation capacity is not available in Tennessee's existing system to meet the Project shipper's need along the Project's path. In addition, Tennessee does not have adequate horsepower or pipeline capacity to transport the additional gas volumes. Although a Commission decision to deny the proposed action would avoid the environmental impacts addressed in this EA, other natural gas projects could be constructed to provide a substitute for the natural gas supplies offered by Tennessee. Such alternative projects would require the construction of additional and/or new facilities in the same or other locations to meet the Project objectives. These alternatives would result in their own set of specific environmental impacts that could be greater or equal to those associated with the current proposal. Therefore, we have dismissed this alternative as a reasonable alternative to meet the Project objectives.

2. SYSTEM ALTERNATIVES

System alternatives are alternatives to the proposed action that would make use of Tennessee's (or other companies') existing, modified, or proposed pipeline systems to meet the states objectives of the proposed Project. System alternatives must provide the same capacity (i.e., 300 million cubic feet of natural gas per day) to the Project shipper as the proposed Project. Additional system alternatives evaluated were loop-only, loop and compression, and existing compressor station alternatives.

10. LOOP ONLY

Looping involves increasing the throughput capacity of an existing natural gas pipeline through the installation of additional pipeline segments that are generally parallel with and connected to the existing pipeline. Looping reduces the rate of pressure drop

from friction in the pipeline and therefore increases the throughput capacity of the pipeline.

The pipeline loop alternative would involve the installation of approximately 77 miles of 36-inch-diameter pipeline and would impact 936 acres of land, 72 acres of wetlands, one known cultural resource, and one residence within 50 feet. This alternative would also involve three major river crossings, 51 wetland crossings, 90 stream and waterbody crossings, and 50 road and highway crossings. This alternative is technically feasible and would meet the Project objectives. However, it would not provide a significant environmental advantage, and we have not considered it further.

2.2 LOOP AND COMPRESSION

The loop and compression alternative would involve the construction of Compressor Station 3A and approximately 38 miles of 36-inch-diameter pipeline between Tennessee's existing Compressor Stations 17 and 9. This alternative would eliminate Compressor Station 11A. This alternative would impact 516 acres of land and 23 acres of wetlands, and would involve one major river crossing, 25 wetland crossings, 54 stream and waterbody crossings, and 21 road and highway crossings. This alternative is technically feasible and would meet the Project objectives. However, it would not provide a significant environmental advantage, and we have not considered it further.

2.2 EXISTING COMPRESSOR STATIONS

The existing compressor station alternative would require approximately 45,000 hp at the existing Compressor Stations 9 and the NET Mexico Gillrina Road delivery point, and would involve running existing capacity at Compressor Stations 9 and 1 more frequently than would be required by the proposed Project. This alternative would result in significantly greater emissions of NO_x and CO due to running older, existing compressors at Compressor Stations 9 and 1 and would result in an approximate 1,176 percent and 1,530 percent increase in NO_x and CO emissions, respectively. This alternative would also require the expansion of Compressor Station 9 and the NET Mexico Gillrina Road delivery point, which would result in similar land impacts as the Project. This alternative is technically feasible, and has similar land impacts as the Project, but results in significantly greater emissions. Therefore, it would not provide a significant environmental advantage, and we have not considered it further.

2.2 ALTERNATIVE ANALYSIS USING ELECTRIC MOTOR-DRIVEN COMPRESSORS

Tennessee evaluated electric motor-driven compression as an alternative to natural gas-fired compression. The Project is proposed near the Gulf of Mexico, which experiences regular hurricanes. Tennessee was concerned with electric power loss in the event of a hurricane and a potential inability to deliver natural gas due to the use of an

electric motor-driven compressor at these stations. Additional high voltage power transmission lines and substations would be required in this alternative. The construction of additional transmission lines and substations to support the electric-driven compressor units would result in greater environmental impact than the natural gas-driven compressor units proposed in the Project. This alternative would result in significantly fewer direct emissions at the Project locations, but would result in indirect emissions at the power generation facility. Based on these reasons, in addition to cost, this alternative would not provide a significant environmental advantage, and we have not considered it further.

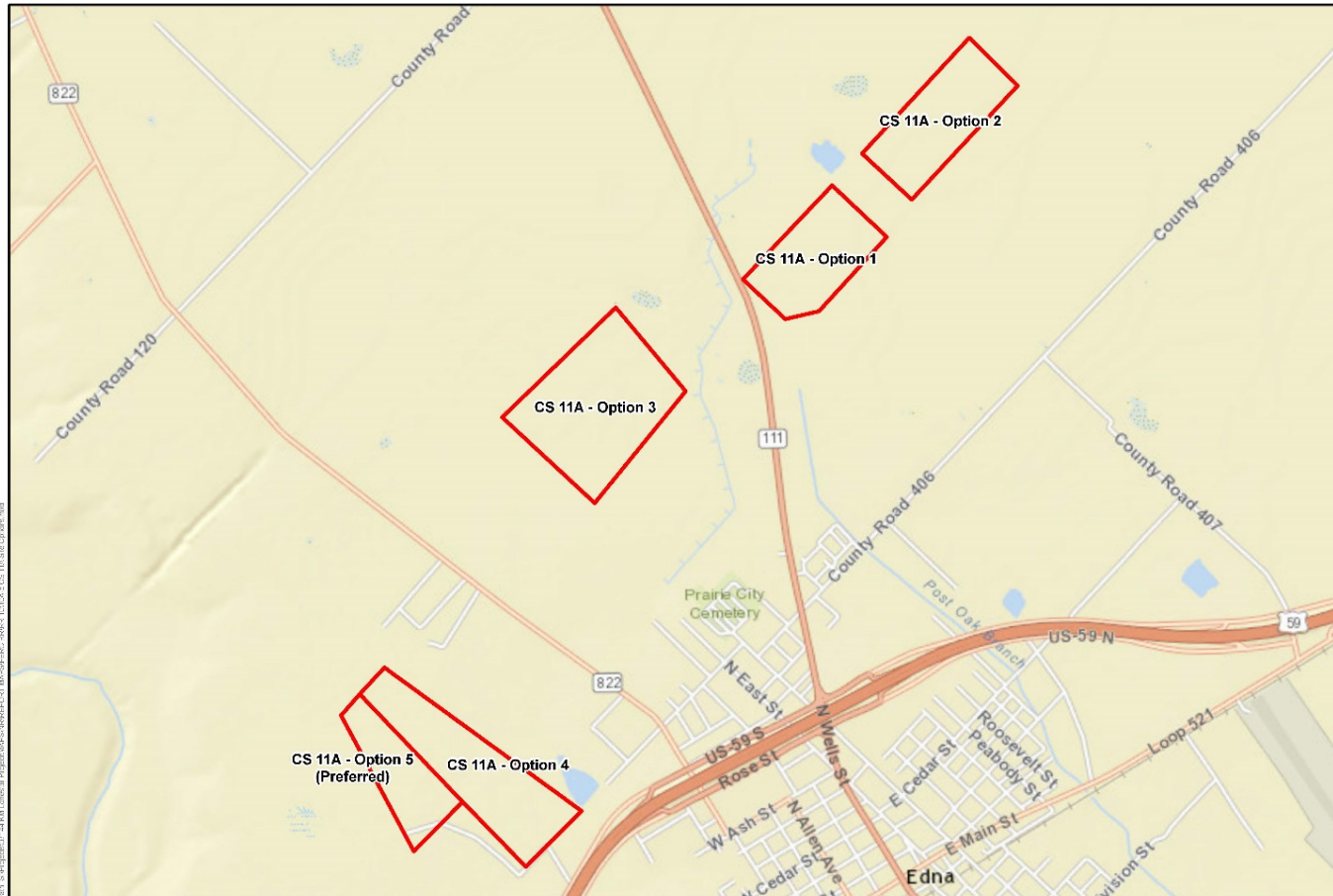
One commenter suggested that electric driven-compression would result in less vibration. As discussed in section B.9.5, the Project is not expected to result in any perceptible vibration.

2. SITE ALTERNATIVES

Because the proposed location for Compressor Station 3A did not present any environmental concerns, and because landowners at the two site location alternatives were not willing to sell the properties, the alternative site locations for Compressor Station 3A are not evaluated here. A total of five site locations were evaluated for Compressor Station 11A.

For Compressor Station 11A, multiple stakeholders suggested additional site locations further east of Highway 111 and locations to the southwest of the proposed location in Edna, Texas. These alternative locations were viewed by stakeholders as more environmentally advantageous than the proposed location. Tennessee modeled the hydraulics of the existing 100 Line to determine the range of optimal locations for Compressor Station 11A. Tennessee determined that Compressor Station 11A could not be located further to the southwest without requiring additional horsepower to remain hydraulically equivalent to the proposed location. This would result in additional air emissions and is therefore not an environmentally advantageous alternative. Tennessee also evaluated two additional locations east of Highway 111 in Edna, Texas. The most feasible of these two alternatives is discussed below. The other site alternative locations did not present significant environmental advantages and are not considered further.

Figure 4 Compressor Station 11A Site Alternatives Map



Path: S:\Project\07-44\N\Concept\Project\Map\06650311_MCS\Map04_Comp_Station_11A_Site_Alternatives.mxd

	<p>LONE STAR PROJECT COMPRESSOR STATION 11A SITE ALTERNATIVES MAP JACKSON COUNTY, TEXAS</p>	<p>Site Option Boundary</p>	<table border="1"> <tr><td>Background:</td><td>ESRI Street Map</td></tr> <tr><td>Scale:</td><td>1:28,000</td></tr> <tr><td>Drawn by:</td><td>SC</td></tr> <tr><td>Approved By:</td><td>JW</td></tr> <tr><td>SWCA Project No.:</td><td>37514</td></tr> <tr><td>Date Produced:</td><td>August 07, 2010</td></tr> <tr><td colspan="2">5801 YREB LITR 7.mxd 140 US1111</td></tr> </table>	Background:	ESRI Street Map	Scale:	1:28,000	Drawn by:	SC	Approved By:	JW	SWCA Project No.:	37514	Date Produced:	August 07, 2010	5801 YREB LITR 7.mxd 140 US1111	
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	<p>FIGURE 4</p>																

2.2 COMPRESSOR STATION 11A OPTION 2

Compressor Station 11A Option 2 (Option 2) was evaluated as an alternative site location to Compressor Station 11A. The relative location of Option 2 is provided on figure 4. Option 2 is an approximately 77 acre parcel east of Highway 111, located north from the Edna town center. Option 2 provides a location that is more isolated and further from large residential communities. However, both the proposed Project location and Option 2 are less than 0.25 mile from the nearest residential homeowner. In addition, sites further northeast of Highway 111 (i.e., Option 2) had higher populations of both low income and minority individuals than the proposed Compressor Station 11A site.

Option 2 would require about 1,300 feet of interconnecting pipeline, while the proposed Project location would require about 200 feet of interconnecting pipeline. The proposed Project location would impact about 12 acres and 14 acres of 100-year and 500-year floodplain, respectively, while Option 2 would not impact any 100-year or 500-year floodplains. The proposed Project location would impact about 50 acres of agricultural land, while Option 2 would impact about 7 acres of forest/woodland and 70 acres of open land. The proposed Project location has an existing dirt access road, while Option 2 would require a new access road. For all other environmental concerns, both the proposed Project location and Option 2 have either similar or negligible impacts. Both locations would require the same horsepower units be installed. Tennessee has acquired the land for the proposed Compressor Station 11A; Tennessee stated that the landowner of the Option 2 site was nonresponsive. A summary of environmental impacts associated with both alternatives is provided below in table 12.

Table 12 Estimated Potential Impacts for the Proposed Compressor Station 11A and Option 2		
Siting Variable	Proposed Compressor Station 11A	Option 2
Length of Interconnecting Pipe Needed to Center of Parcel (ft)	201	1,271
Length of New Access Roads (ft)	706	3,116
Parcel Size (acres)	52.1	76.8
Closest Building ¹ (ft)	1,300	700
Number of Ephemeral Surface waterbodies	1	0
100-year Floodplains (acres)	12.3	0
500-year Floodplains (acres)	14.2	0
Prime Farmland (acres)	52.1	70.6
Agriculture and/or Rangeland (acres)	52.1	0
Forest/woodland (acres)	0	6.8
Open Land (acres)	0	70
Existing roads on parcel (number)	1	0
¹ Distances to the closest building were approximated by using satellite imagery		

During the scoping session, 16 residents expressed concerns with the proposed site location of Compressor Station 11A due to proximity to residential areas. While the proposed Compressor Station 11A is closer to a larger number of residential communities than the Option 2 site, Option 2 is closer to the nearest homeowner than the proposed Compressor Station 11A. Residents expressed concern with a number of environmental issues (see table 2); however, the primary concerns raised were air quality and safety. Section B of this EA addresses these concerns and concludes that the impacts associated with the proposed Compressor Station 11A are not significant. Further, the proposed location would be located within 100 and 500 year floodplains. However, with the mitigation measures listed above in section B.5.7, we conclude that the proposed compressor station location would not result in a floodplain rise as a result of its partial placement within the floodplain. Therefore, because the impacts associated with the proposed Compressor Station 11A are not significant, and because Option 2 alternative does not present any significant environmental advantage, Option 2 is not considered further.

2. CONCLUSION

We reviewed alternatives to Tennessee's proposal based on our independent analysis. Although several of the alternatives appear to be technically feasible, no system, or aboveground facility alternatives provide a significant environmental advantage over the Project design. Therefore, we conclude that Tennessee's proposed Project, as modified by our recommended mitigation measures, is the preferred alternative that can meet the Project objectives.

D. CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis in this EA, we have determined that if Tennessee constructs and operates the proposed facilities in accordance with its application and supplements, and the staff's recommended mitigation measures below, approval of the Project would not constitute a major action significantly affecting the quality of the human environment. We recommend that the Commission Order contain a finding of no significant impact and include the measures listed below as conditions in any authorization the Commission may issue to Tennessee.

1. Tennessee shall follow the construction procedures and mitigation measures described in its application and supplements (including responses to staff data requests) and as identified in the EA, unless modified by the Order. Tennessee must:
 - a. request any modification to these procedures, measures, or conditions in a filing with the Secretary;
 - b. justify each modification relative to site-specific conditions;
 - c. explain how that modification provides an equal or greater level of environmental protection than the original measures; and
 - d. receive approval in writing from the Director of OEP **before using that modification.**

2. The Director of OEP has delegated authority to take whatever steps are necessary to ensure the protection of all environmental resources during construction and operation of the Project. This authority shall allow:
 - a. the modification of conditions of the Order; and
 - b. the design and implementation of any additional measures deemed necessary (including stop-work authority) to assure continued compliance with the intent of the environmental conditions as well as the avoidance or mitigation of adverse environmental impact resulting from Project construction and operation.

3. **Prior to any construction**, Tennessee shall file an affirmative statement with the Secretary, certified by a senior company official, that all company personnel, EIs, and contractor personnel will be informed of the EI's authority and have been or will be trained on the implementation of the environmental mitigation measures appropriate to their jobs **before** becoming involved with construction and restoration activities.

4. The authorized facility locations shall be as shown in the EA, as supplemented by filed Project site drawings. **As soon as they are available, and before the start of construction**, Tennessee shall file with the Secretary any revised detailed facility maps/plot plans at a scale not smaller than 1:6,000 for the facilities approved by the Order. All requests for modifications of environmental conditions of the Order or site-specific clearances must be written and must reference locations designated on these maps/plans.

Tennessee's exercise of eminent domain authority granted under NGA section 7(h) in any condemnation proceedings related to the Order must be consistent with these authorized facilities and locations. Tennessee's right of eminent domain granted under NGA section 7(h) does not authorize it to increase the size of its natural gas facilities to accommodate future needs or to acquire a right-of-way to transport a commodity other than natural gas.

5. Tennessee shall file with the Secretary detailed maps/sheets and aerial photographs at a scale not smaller than 1:6,000 identifying all route realignments or facility relocations, and staging areas, pipe storage yards, new access roads, and other areas that would be used or disturbed and have not been previously identified in filings with the Secretary. Approval for each of these areas must be explicitly requested in writing. For each area, the request must include a description of the existing land use/cover type, and documentation of landowner approval, whether any cultural resources or federally listed threatened or endangered species would be affected, and whether any other environmentally sensitive areas are within or abutting the area. All areas shall be clearly identified on the maps/sheets/aerial photographs. Each area must be approved in writing by the Director of the OEP before construction in or near that area.

This requirement does not apply to extra workspaces allowed by the Commission's Plan and/or minor field realignments per landowner needs and requirements which do not affect other landowners or sensitive environmental areas such as wetlands.

Examples of alterations requiring approval include all route realignments and facility location changes resulting from:

- a. implementation of cultural resource mitigation measures;
- b. implementation of endangered, threatened, or special concern species mitigation measures;
- c. recommendations by state regulatory authorities; and
- d. agreements with individuals landowners that affect other landowners or could affect sensitive environmental areas.

6. **Within 60 days of the acceptance of this authorization and before construction begins**, Tennessee shall file an Implementation Plan with the Secretary for review and written approval by the Director of the OEP. Tennessee must file revisions to the plan as schedules change. The plan shall identify:
- a. how Tennessee would implement the construction procedures and mitigation measures described in its application and supplements (including responses to staff data requests), identified in the EA, and required by the Order;
 - b. how Tennessee would incorporate these requirements into the contract bid documents, construction contracts (especially penalty clauses and specifications), and construction drawings so that the mitigation required at each site is clear to onsite construction and inspection personnel;
 - c. the number of EIs assigned per facility, and how the company would ensure that sufficient personnel are available to implement the environmental mitigation;
 - d. company personnel, including EIs and contractors, who would receive copies of the appropriate material;
 - e. the location and dates of the environmental compliance training and instruction Tennessee would give to all personnel involved with construction and restoration (initial and refresher training as the project progresses and personnel change);
 - f. the company personnel (if known) and specific portion of Tennessee's organization having responsibility for compliance;
 - g. the procedures (including use of contract penalties) Tennessee would follow if noncompliance occurs; and
 - h. for each discrete facility, a Gantt or PERT chart (or similar project scheduling diagram), and dates for:
 - i. the completion of all required surveys and reports;
 - ii. the environmental compliance training of onsite personnel;
 - iii. the start of construction; and
 - iv. the start and completion of restoration.
7. Tennessee shall employ at least one EI. The EI(s) shall be:
- a. responsible for monitoring and ensuring compliance with all mitigation measures required by the Order and other grants, permits, certificates, or other authorizing documents;
 - b. responsible for evaluating the construction contractor's implementation of the environmental mitigation measures required in the contract (see condition 6 above) and any other authorizing document;
 - c. empowered to order correction of acts that violate the environmental conditions of the Order, and any other authorizing document;

- d. a full-time position, separate from all other activity inspectors;
 - e. responsible for documenting compliance with the environmental conditions of the Order, as well as any environmental conditions/permit requirements imposed by other federal, state, or local agencies; and
 - f. responsible for maintaining status reports.
8. Beginning with the filing of its Implementation Plan, Tennessee shall file updated status reports with the Secretary on a **monthly basis until all construction and restoration activities are complete**. On request, these status reports would also be provided to other federal and state agencies with permitting responsibilities. Status reports shall include:
- a. an update on Tennessee's efforts to obtain the necessary federal authorizations;
 - b. the construction status of the Project, work planned for the following reporting period, and any schedule changes for stream crossings or work in other environmentally sensitive areas;
 - c. a listing of all problems encountered and each instance of noncompliance observed by the EI during the reporting period both for the conditions imposed by the Commission and any environmental conditions/permit requirements imposed by other federal, state, or local agencies;
 - d. a description of the corrective actions implemented in response to all instances of noncompliance, and their cost;
 - e. the effectiveness of all corrective actions implemented;
 - f. a description of any landowner/resident complaints which may relate to compliance with the requirements of the Order, and the measures taken to satisfy their concerns; and
 - g. copies of any correspondence received by Tennessee from other federal, state, or local permitting agencies concerning instances of noncompliance, and Tennessee's response.
9. **Prior to receiving written authorization from the Director of the OEP to commence construction of any Project facilities**, Tennessee shall file with the Secretary documentation that it has received all applicable authorizations required under federal law (or evidence of waiver thereof).
10. Tennessee must receive written authorization from the Director of OEP **before placing the new compressor stations into service**. Such authorization would only be granted following a determination that rehabilitation and restoration of the areas affected by the Project are proceeding satisfactorily.

11. **Within 30 days of placing the authorized facilities in service**, Tennessee shall file an affirmative statement with the Secretary, certified by a senior company official:
 - a. that the facilities have been constructed in compliance with all applicable conditions, and that continuing activities will be consistent with all applicable conditions; or
 - b. identifying which of the conditions in the Order Tennessee has complied with or will comply with. This statement shall also identify any areas affected by the Project where compliance measures were not properly implemented, if not previously identified in filed status reports, and the reason for noncompliance.

12. **Prior to construction**, Tennessee shall file with the Secretary a visual screening plan for the Compressor Stations 3A and 11A that includes vegetative screening of the proposed compressor station sites, for review and written approval by the Director of OEP.

13. Tennessee shall file with the Secretary noise surveys for Compressor Stations 3A and 11A **no later than 60 days** after placing each station into service. If a full power load condition noise survey is not possible, Tennessee should file an interim survey at the maximum possible power load **within 60 days** of placing the station into service and file the full power load survey **within 6 months**. If the noise attributable to operation of all equipment at the station under interim or full power load conditions exceeds an L_{dn} of 55 dBA at any nearby NSA, Tennessee shall:
 - a. file a report with the Secretary, for review and written approval by the Director of OEP, on what changes are needed;
 - b. install additional noise controls to meet that level **within 1 year** of the in-service date; and
 - c. confirm compliance with this requirement by filing a second full power load noise survey with the Secretary for review and written approval by the Director of OEP **no later than 60 days** after it installs the additional noise controls.

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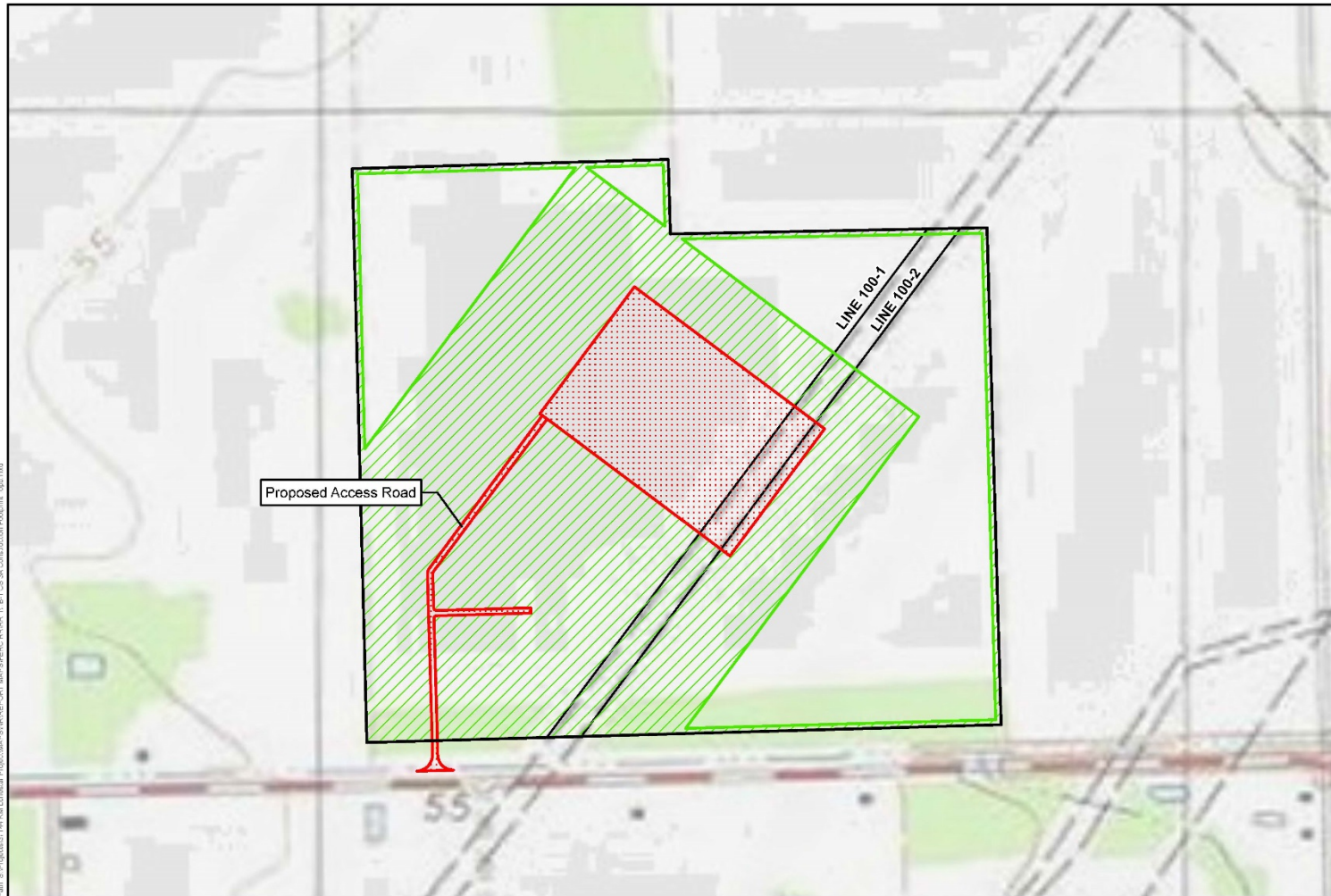
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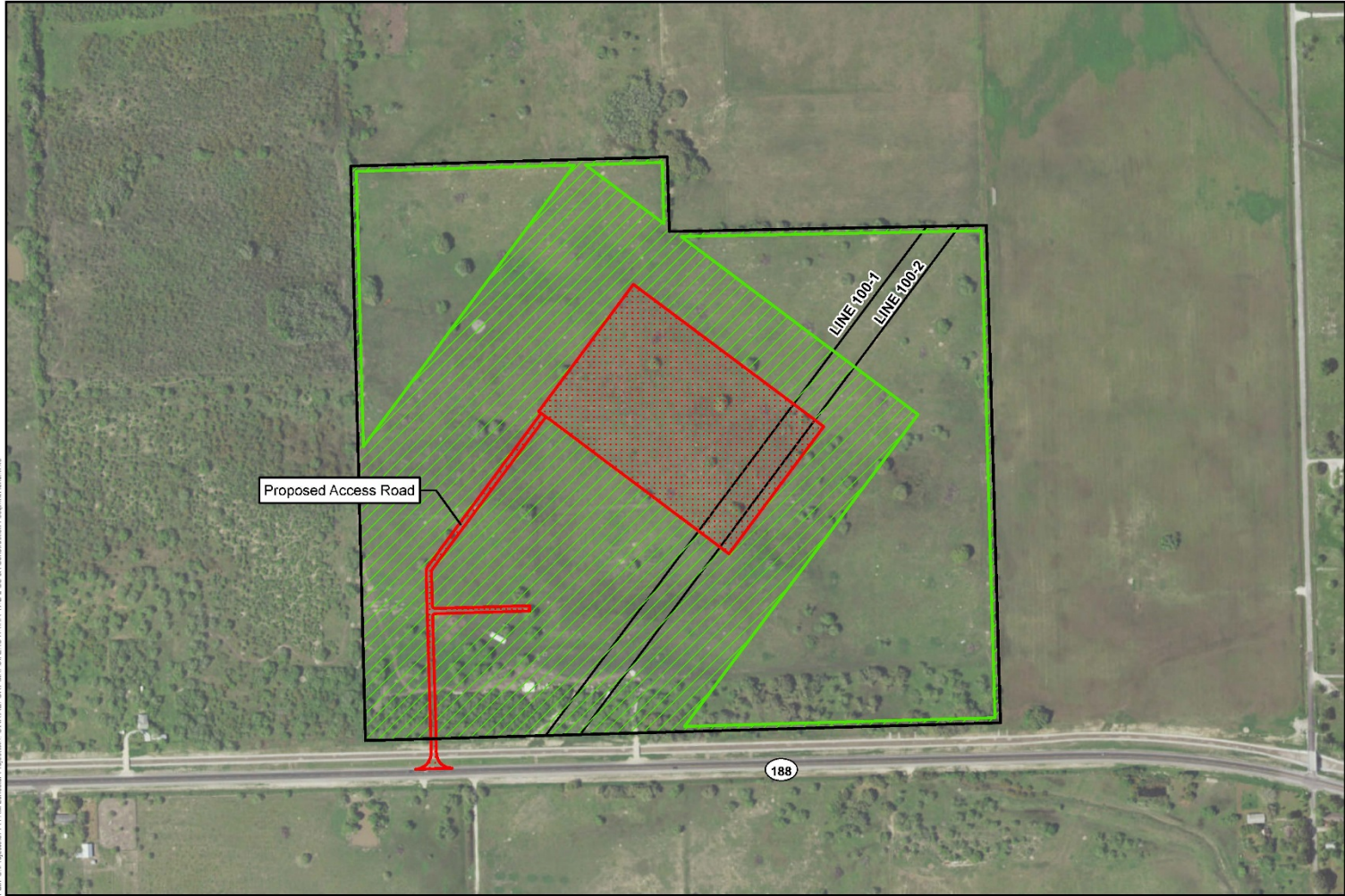
Appendix A

Project Figures



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 SWCA ENVIRONMENTAL CONSULTANTS	LONE STAR PROJECT COMPRESSOR STATION 3A TOPOGRAPHIC SITE MAP SAN PATRICIO COUNTY, TEXAS	<ul style="list-style-type: none"> Property Boundary TGP Line Construction Footprint Operational Footprint Temporary Workspace 	<table border="1" style="font-size: 8px; border-collapse: collapse; width: 100%;"> <tr><td>Background:</td><td>USGS Topographic Map</td></tr> <tr><td>Scale:</td><td>1:5,000</td></tr> <tr><td>Created By:</td><td>JW</td></tr> <tr><td>Approved By:</td><td>LW</td></tr> <tr><td>SWCA Project No.:</td><td>37244</td></tr> <tr><td>Date Produced:</td><td>August 18, 2016</td></tr> </table>	Background:	USGS Topographic Map	Scale:	1:5,000	Created By:	JW	Approved By:	LW	SWCA Project No.:	37244	Date Produced:	August 18, 2016
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SWCA Project No.:	37244														
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 Tennessee Gas Pipeline Company, L.L.C. <small>A Kinder Morgan Company</small>	FIGURE A.1	<table border="1" style="font-size: 8px; border-collapse: collapse; width: 100%;"> <tr><td colspan="2" style="text-align: center;">NAD 1983 UTM Zone 18N US FEET</td></tr> <tr><td style="text-align: center;">0</td><td style="text-align: center;">500 Feet</td></tr> <tr><td colspan="2" style="text-align: center;"></td></tr> <tr><td style="text-align: center;">0</td><td style="text-align: center;">50 100 150 Meters</td></tr> </table>	NAD 1983 UTM Zone 18N US FEET		0	500 Feet			0	50 100 150 Meters					
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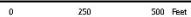




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	<p>LONE STAR PROJECT COMPRESSOR STATION 3A AERIAL SITE MAP SAN PATRICIO COUNTY, TEXAS</p>	<p> Property Boundary TGP Line Construction Footprint Operational Footprint Temporary Workspace </p>	<p> Background: ESRI Aerial Imagery (2024) Scale: 1:5,000 Created By: JS Approved By: LW SWCA Project No.: 27244 Date Produced: August 16, 2024 NAD 1983 UTM Zone 18N US FEET </p>
	<p>FIGURE A.2</p>		



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 SWCA ENVIRONMENTAL CONSULTANTS	LONE STAR PROJECT COMPRESSOR STATION 11A TOPOGRAPHIC SITE MAP JACKSON COUNTY, TEXAS	<ul style="list-style-type: none"> Project Boundary TGP Line Construction Footprint Operational Footprint Temporary Workspace 	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="font-size: 8px;">Background:</td><td style="font-size: 8px;">USGS Topographic Map</td></tr> <tr><td style="font-size: 8px;">Scale:</td><td style="font-size: 8px;">1:5,000</td></tr> <tr><td style="font-size: 8px;">Created By:</td><td style="font-size: 8px;">JS</td></tr> <tr><td style="font-size: 8px;">Approved By:</td><td style="font-size: 8px;">LW</td></tr> <tr><td style="font-size: 8px;">SWCA Project No.:</td><td style="font-size: 8px;">37244</td></tr> <tr><td style="font-size: 8px;">Date Produced:</td><td style="font-size: 8px;">August 12, 2016</td></tr> </table> <div style="text-align: center; font-size: 8px;">  NAD 1983 UTM Zone 14N US FEET </div> <div style="text-align: center; font-size: 8px;">  0 250 500 Feet </div> <div style="text-align: center; font-size: 8px;">  0 50 100 150 Meters </div>	Background:	USGS Topographic Map	Scale:	1:5,000	Created By:	JS	Approved By:	LW	SWCA Project No.:	37244	Date Produced:	August 12, 2016
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SWCA Project No.:	37244														
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 Tennessee Gas Pipeline Company, L.L.C. <small>A Kinder Morgan Company</small>		FIGURE A.3													



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SWCA
ENVIRONMENTAL CONSULTANTS

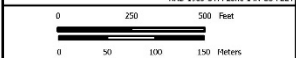


LONE STAR PROJECT
COMPRESSOR STATION 11A
AERIAL SITE MAP JACKSON
COUNTY, TEXAS

FIGURE A.4

- Property Boundary
- TGP Line
- Construction Footprint**
- Operational Footprint
- Temporary Workspace

Background:	NAIP AERIAL IMAGERY (2014)
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Approved By:	LW
SWCA Project No.:	37244
Date Produced:	August 12, 2016



Appendix B

Federal, State, and Local Permits for the Project

Table B.1 Federal, State, and Local Permits for the Project		
Agency	Permit/Approval/Consultations	Status
Federal		
FERC	Certificate of Public Convenience and Necessity under section 7(c) of the Natural Gas Act	Filed August 18, 2016; ongoing
U.S. Army Corps of Engineers (USACE)	Section 404 of the <i>Clean Water Act</i>	N/A (Impact below requirement for Preconstruction Notification)
U. S. Fish and Wildlife Service (USFWS), Corpus Christi, Texas Ecological Services Field Office	Consultation regarding compliance with section 7 of the <i>ESA</i>	Correspondence dated 9/2/16 determined that the Project may affect, but is not likely to adversely effect the whooping crane, and concurred with the no effect determination for all other species
	Consultation regarding compliance with the <i>Migratory Bird Treaty Act</i>	
Texas State Historic Preservation Office (SHPO)	Section 106 of the National Historic Preservation Act	Correspondence dated 6/7/16 determined that the Project would have no effect on historic properties
Apache Tribe of Oklahoma		NOI submitted 10/12/16; initial letter submitted 11/28/16; no response from tribe
Comanche Nation		NOI submitted 10/12/16; initial letter submitted 11/28/16; no response from tribe
Kiowa Tribe of Oklahoma		NOI submitted 10/12/16; initial letter submitted 11/28/16; no response from tribe
Tonkawa Tribe of Oklahoma		NOI submitted 10/12/16; initial letter submitted 11/28/16; no response from tribe
Wichita and Affiliated Tribes		NOI submitted 10/12/16; initial letter submitted 11/28/16; no response from tribe
Alabama Coushatta Tribe of Texas		NOI submitted 10/12/16; no response from tribe
Caddo Nation		NOI submitted 10/12/16; no response from tribe
State		
Texas Commission on Environmental Quality, Division of Air Quality	Permit by Rule Registration	Ongoing
Railroad Commission of Texas	Section 402 of the Clean Water Act, National Pollutant Discharge Elimination System permit for hydrostatic testing water	To be filed prior to construction
Local		
San Patricio County	Floodplain Management Department Development Permit	To be filed prior to construction
San Patricio Groundwater Conservation District (GCD)	Water Well Production Permit	To be filed prior to construction
Jackson County	Drainage/Floodplain Development Permit	To be filed prior to construction
Texana GCD	Water Well Drilling Permit	To be filed prior to construction
Texana GCD	Water Well Production Permit	To be filed prior to construction

Document Content(s)

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