Construction Permit
Source Analysis & Technical Review

Company	**TEXAS LNG BROWNSVILLE LLC**	Permit Number	**139561**
City	**Brownsville**	Project Number	**250128**
County	**Cameron**	Account Number	**N/A**
Project Type	**Initial**	Regulated Entity Number	**RN109146928**
Project Reviewer	**Joel Lunsford and Sushil Gautam, Ph.D.**	Customer Reference Number	**CN605117431**
Site Name	**Texas LNG Brownsville**		

Project Overview

Texas LNG Brownsville LLC (Texas LNG) has requested a permit for a LNG export terminal on the Brownsville Ship Channel (BSC) located near Brownsville, Cameron County, Texas. The facility has 2 trains and will consist of 5 emergency engines, 8 firewater pumps, 5 flares, 2 heaters, 2 thermal oxidizers, and 6 tanks.

Emission Summary

Air Contaminant	Proposed Allowable Emission Rates (tpy)
PM	6.35
PM_{10}	6.35
$PM_{2.5}$	6.35
VOC	13.2
NO_X	104.9
CO	193.2
SO_2	76.8
HAPs	2.04

Compliance History Evaluation - 30 TAC Chapter 60 Rules

A compliance history report was reviewed on:	**April 28, 2020**
Site rating & classification:	**N/A**
Company rating & classification:	**N/A**
If the rating is 50<RATING<55, what was the outcome, if any, based on the findings in the formal report:	**N/A**
Has the permit changed on the basis of the compliance history or rating?	**No**

Public Notice Information - 30 TAC Chapter 39 Rules

Rule Citation	Requirement	
39.403	Date Application Received:	**March 24, 2016**
	Date Administratively Complete:	**April 1, 2016**
	Small Business Source?	**No**
	Date Leg Letters mailed:	**April 1, 2016**
39.603	Date Published:	**April 27, 2016**
	Publication Name:	***The Brownsville Herald***
	Pollutants:	nitrogen oxides, carbon monoxide, organic compounds, particulate matter including particulate matter with diameters of 10 microns or less and 2.5 microns or less, sulfur dioxide, and hazardous air pollutants, including, but not limited to hydrogen sulfide.

	Date Affidavits/Copies Received:	**May 2, 2016**
	Is bilingual notice required?	**Yes**
	Language:	**Spanish**
	Date Published:	**April 27, 2016**
	Publication Name:	***El Nuevo Heraldo***
	Date Affidavits/Copies Received:	**May 2, 2016**
	Date Certification of Sign Posting / Application Availability Received:	**June 6, 2016**
39.604	Public Comments Received?	**Yes**
	Hearing Requested?	**Yes**
	Meeting Request?	**Yes**
	Date Meeting Held:	**October 11, 2016**
	Date Response to Comments sent to OCC:	**March 19, 2019**
	Request(s) withdrawn?	**No**
	Date Withdrawn:	**N/A**
	Consideration of Comments:	**N/A**
	Is 2nd Public Notice required?	**Yes**
39.602(c)	Date SB 709 Legislative Notification Sent:	**June 22, 2016**
39.419	Date 2nd Public Notice/Preliminary Decision Letter Mailed:	**September 19, 2016**
39.413	Date Cnty Judge, Mayor, and COG letters mailed:	**N/A**
	Date Federal Land Manager letter mailed:	**N/A**
39.605	Date affected states letter mailed:	**N/A**
39.603	Date Published:	**September 25, 2016**
	Publication Name:	***The Brownsville Herald***
	Pollutants:	nitrogen oxides, carbon monoxide, organic compounds, particulate matter including particulate matter with diameters of 10 microns or less and 2.5 microns or less, sulfur dioxide, and hazardous air pollutants, including, but not limited to hydrogen sulfide.
	Date Affidavits/Copies Received:	**September 30, 2016**
	Is bilingual notice required?	**Yes**
	Language:	**Spanish**
	Date Published:	**September 25, 2016**
	Publication Name:	***El Nuevo Heraldo***
	Date Affidavits/Copies Received:	**September 30, 2016**
	Date Certification of Sign Posting / Application Availability Received:	**November 2, 2016**
	Public Comments Received?	**Yes**
	Meeting Request?	**Yes**
	Date Meeting Held:	**October 11, 2016**

	Hearing Request?	**Yes**
	Date Hearing Held:	**November 20, 2019**
	Request(s) withdrawn?	**No**
	Date Withdrawn:	**N/A**
	Consideration of Comments:	**N/A**
39.421	Date RTC, Technical Review & Draft Permit Conditions sent to OCC:	**5/7/2020**
	Request for Reconsideration Received?	**No**
	Final Action:	**Issued**
	Are letters Enclosed?	**No**

Construction Permit & Amendment Requirements - 30 TAC Chapter 116 Rules

Rule Citation	Requirement	
116.111(a)(2)(G)	Is the facility expected to perform as represented in the application?	**Yes**
116.111(a)(2)(A)(i)	Are emissions from this facility expected to comply with all TCEQ air quality Rules & Regulations, and the intent of the Texas Clean Air Act?	**Yes**
116.111(a)(2)(B)	Emissions will be measured using the following method:	**Engineering calculations**
	Comments on emission verification:	
116.111(a)(2)(D)	Subject to NSPS?	**Yes**
	Subparts **A** & **Dc, Kb, IIII**	
116.111(a)(2)(E)	Subject to NESHAP?	**No**
	Subparts & N/A	
116.111(a)(2)(F)	Subject to NESHAP (MACT) for source categories?	**Yes**
	Subparts **A** & **ZZZZ**	
116.111(a)(2)(H)	**Nonattainment review applicability:** Cameron County is in attainment for all NAAQS pollutants, therefore the facility is not subject to NA review.	
116.111(a)(2)(I)	**PSD review applicability:** The facility is not a named source and does not exceed the PSD standards for any pollutant, therefore the facility is not subject to federal review	
116.111(a)(2)(L)	Is Mass Emissions Cap and Trade applicable to the new or modified facilities?	**No**
	If yes, did the proposed facility, group of facilities, or account obtain allowances to operate:	**N/A**
116.140 - 141	Permit Fee: $ **75,000.00** Fee certification:	**273766**

Title V Applicability - 30 TAC Chapter 122 Rules

Rule Citation	Requirement
122.10(14)	**Title V applicability:** The facility emits greater than 100 tpy of both NO_x and CO and is therefore subject to Title V requirements and will obtain a Title V permit before beginning operations.
122.602	**Periodic Monitoring (PM) applicability:** Texas LNG is required to operate the flares with a flame present at all times and no visible emissions to reduce particulate. Heaters will track hourly fuel flow to reduce SO_2 emissions. Tanks will track annual throughput to reduce VOC emissions.

122.604	**Compliance Assurance Monitoring (CAM) applicability:** In order to demonstrate destruction efficiency of VOC, the thermal oxidizers will be tested to determine the minimum acceptable temperature and the temperature of the TO will be continuously monitored in order to demonstrate compliance.

Request for Comments

Received From	Program/Area Name	Reviewed By/Date	Comments
Region:	**15**	**N/A**	**No comments received**
City:	**Brownsville**	**N/A**	**N/A**
County:	**Cameron**	**N/A**	**N/A**
ADMT:	**Air Permits Division**	**Justin Cherry/ 9/8/16**	**AQA is acceptable**
EB&T:	**N/A**	**N/A**	**N/A**
Toxicology:	**N/A**	**N/A**	**N/A**
Compliance:	**N/A**	**N/A**	**N/A**
Legal:	**N/A**	**N/A**	**N/A**
Comment resolution and/or unresolved issues:	**N/A**		

Process/Project Description

Pipeline quality natural gas will be routed through the Gas Gate Station on site. The Interconnect Facility at the terminal end will connect to the inlet flange of the terminal meter. From there the gas is moved through a pretreatment facility to remove any unwanted components from the gas stream. Once the gas is treated, it will be routed through one of two liquefaction trains using a propane precooled mixed refrigerant.

The pretreatment facilities are used to remove acid gas, water, and heavy hydrocarbons from the natural gas mix in order to improve liquefaction. Once these waste products are removed they are routed to a thermal oxidizer with a destruction efficiency greater than 99%. The trains also have flares to be used for Maintenance, Startup, or Shutdown (MSS) along any part of the process. Flare 3 is for backup purposes only in case Flare 1 or 2 is down, and is not authorized MSS emissions.

Once liquefied, the gas will be stored in approved storage tanks and Texas LNG will follow all procedures for proper storage and fugitive emission reduction. Once a vessel arrives to load the liquefied gas, a vapor return arm will be used to capture any vapor and return it to the gas train. This process will also be backed up by a marine flare in case of MSS.

Fuel for all equipment (except for diesel-fired emergency generators and firewater pumps) is limited to boil off gas, pipeline quality natural gas, or a blend of these fuels.

Pollution Prevention, Sources, Controls and BACT- [30 TAC 116.111(a)(2)(C)]

Emergency Generators and Firewater Pumps – All engines will use ultra-low sulfur diesel, good combustion practices, and limited hours of operation to reduce emissions. Additionally, the engines will be in compliance with the requirements of NSPS IIII and NESHAP ZZZZ. This represents BACT.

Flares – Combine assist flares will satisfy 40 CFR §60.18 for flare tip velocity and waste gas heat content, and achieve a minimum destruction efficiency of 98% for VOC. Pressure-assisted flares will report specific design standards that meet 98% destruction efficiency. In addition, each flare will have a fuel monitor and operate with a continuous pilot flame. The flares will only be used for MSS. This represents BACT.

Thermal Oxidizers – The thermal oxidizers are each equipped with low NO_x burners to reduce NO_x emissions. In addition, initial compliance tests will determine the minimum temperature at which 99.9% destruction efficiency of VOC can be achieved, and the combustion chamber will continuously monitor the temperature to ensure the destruction rate. This represents BACT.

Heat Transfer Fluid Heaters – The 79.5 MMBtu HTF heaters evaluated the installation of an SCR to help control NO_x

emissions. The heaters already have ultra-low NO_x burners as a control that produces an emission limit of 0.024 lb/MMBtu. However, top tier BACT requires an emission rate of 0.01 lb/MMBtu. An economic evaluation indicated that adding an SCR would not be economically reasonable and would create additional emissions for other pollution without reducing an appreciable amount of NO_x. Therefore, the use of ultra-low NO_x burners is considered BACT.

The project was subject to contested case hearing, and Administrative Law Judges (ALJs) recommended on proposal for decision that permit be issued with updated NOx limit of 0.015 lb/MMBtu. On May 6, 2020 Texas Commission on Environmental Quality (Commission) on its open meeting considered ALJs proposal for decision to update heaters BACT limit to 0.015 lb/MMBtu. Therefore, the updated NOx limit of 0.015 lb/MMBtu represents BACT.

Equipment Leak Fugitives – Total VOC emissions from equipment leak fugitives will be less than 10 tpy, therefore no additional controls are required. However, Texas LNG will implement a leak detection and repair program (LDAR) and monitor these fugitives by following the requirements of the 28M LDAR program. This represents BACT.

Storage Tanks – Texas LNG will have five smaller tanks for used solvent, heat transfer fluid, heavy hydrocarbons, and process water that will be non-pressurized vertical fixed roof tanks. The liquefied natural gas tanks will be pressurized vertical fixed roof tanks. The two condensate storage tanks will be vented to the thermal oxidizers for emission control. All tanks will be painted white. This is considered to be BACT for all tanks.

Maintenance, Startup, and Shutdown (MSS) – MSS activities authorized in the special conditions have minimal emissions that occur infrequently. Emissions during these activities will be minimized by operating the associated facilities in accordance with good air pollution control practices and safe operating practices. This represents BACT.

Impacts Evaluation - 30 TAC 116.111(a)(2)(J)

Was modeling conducted? **Yes**	Type of Modeling: **AERMOD**	
Will GLC of any air contaminant cause violation of NAAQS?		**No**
Is this a sensitive location with respect to nuisance?		**No**
[§116.111(a)(2)(A)(ii)] Is the site within 3000 feet of any school?		**No**

Summary of Modeling Results

The air quality analysis (AQA) is acceptable for all review types and pollutants. The results are summarized below.

Table 1. Site-wide Modeling Results for State Property Line

Pollutant	Averaging Time	GLCmax (µg/m^3)	Standard (µg/m^3)
SO_2	1-hr	79	1021
H_2S	1-hr	0.005	108

The De Minimis analysis modeling results indicate that 1-hr and 24-hour SO_2 exceed the respective de minimis concentrations and require a full impacts analysis. The full NAAQS modeling results indicate the total predicted concentrations will not result in an exceedance of the NAAQS.

Table 2. Modeling Results for Minor NSR De Minimis

Pollutant	Averaging Time	GLCmax (µg/m^3)	De Minimis (µg/m^3)
SO_2	1-hr	9.9	7.8
SO_2	3-hr	20.8	25
SO_2	24-hr	5.3	5

SO_2	Annual	0.6	1
PM_{10}	24-hr	0.8	5
$PM_{2.5}$	24-hr	0.8	1.2
$PM_{2.5}$	Annual	0.06	0.3
NO_2	1-hr	6.4	7.5
NO_2	Annual	0.4	1
CO	1-hr	635	2000
CO	8-hr	53	500

Table 3. Total Concentrations for Minor NSR NAAQS (Concentrations > De Minimis)

Pollutant	Averaging Time	GLCmax ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Conc. = [Background + GLCmax] ($\mu g/m^3$)	Standard ($\mu g/m^3$)
SO_2	1-hr	10	10.6	20.6	196
SO_2	24-hr	5.3	2.9	8.2	365

The GLCmax for all pollutants and averaging times represent the maximum predicted concentrations associated with one year of meteorological data.

Intermittent guidance was relied on for the 1-hr NO_2 and 1-hr SO_2 Minor NSR NAAQS analyses.

The justification for selecting the EPA's interim 1-hr NO_2 and 1-hr SO_2 De Minimis levels was based on the assumptions underlying EPA's development of the 1-hr NO_2 and 1-hr SO_2 De Minimis levels. As explained in EPA guidance memoranda[1,2], the EPA believes it is reasonable as an interim approach to use a De Minimis level that represents 4% of the 1-hr NO_2 and 1-hr SO_2 NAAQS.

Background concentrations for SO_2 were obtained from the EPA AIRS monitor 483550032 located at 3810 Huisache St., Corpus Christi, Nueces County. The three-year average (2013-2015) of the 99th percentile of the annual distribution of the maximum daily 1-hr concentrations was used for the 1-hr value. The high, second high 24-hr concentration from 2015 was used for the 24-hr value. The use of this monitor is reasonable based on a comparison of county-wide emissions, population, and a quantitative review of emissions sources in the surrounding area of the monitor site relative to the project site.

1 www.epa.gov/region07/air/nsr/nsrmemos/appwso2.pdf

2 www.epa.gov/nsr/documents/20100629no2guidance.pdf

3 www.epa.gov/ttn/scram/guidance/guide/Guidance_for_PM25_Permit_Modeling.pdf

The applicant provided an evaluation of ambient $PM_{2.5}$ monitoring data, consistent with EPA guidance for $PM_{2.5}$[3], for using the $PM_{2.5}$ De Minimis levels in the NAAQS analysis. If monitoring data show that the difference between the $PM_{2.5}$ NAAQS and the monitored $PM_{2.5}$ background concentrations in the area is greater than the $PM_{2.5}$ De Minimis level, then the proposed project with predicted impacts below the De Minimis level would not cause or contribute to a violation of the $PM_{2.5}$ NAAQS and does not require a full impacts analysis.

Background concentrations for $PM_{2.5}$ were obtained from the EPA AIRS monitor 483550034 located at 5707 Up River Rd., Corpus Christi, Nueces County. The three-year average (2013-2015) of the 98th percentile of the annual distribution of the 24-hr concentrations was used for the 24-hr value (22.9 µg/m^3). The three-year average (2013-2015) of the annual mean concentrations was used for the annual value (9.1 µg/m^3). Although data from the closest ambient air monitor to the project site were not used, the use of this monitor is reasonable based on a comparison of county-wide emissions, population, and a quantitative review of emissions sources in the surrounding area of the monitor site relative to the project site.

The total maximum concentrations for all of the pollutants were below their corresponding ESL. Therefore, no adverse impact to human health and the environment is anticipated. Additionally, this project will not cause or contribute to an exceedance of the NAAQS.

Permit Concurrence and Related Authorization Actions

Is the applicant in agreement with special conditions?	**Yes**
Company representative(s):	**Ann Curnow**
Contacted Via:	**Email**
Date of contact:	**June 30, 2016**
Other permit(s) or permits by rule affected by this action:	**No**

Project Reviewer	Date	Team Leader	Date
Sushil Gautam, Ph.D.	May 7, 2020	Ryan Tedford	May 7, 2020