TECHNICAL REVIEW: AIR PERMIT BY RULE

Permit No.:	155544	***Company Name:***	Space Exploration Technologies Corp.	***APD Reviewer:***	Donna Wurst
Project No.:	296290	***Unit Name:***	SpaceX Texas Launch Site Generator	***PBR No(s).:***	106.512

GENERAL INFORMATION			
Regulated Entity No.:	RN107697088	**Project Type:**	Permit by Rule Application
Customer Reference No.:	CN602867657	**Date Received by TCEQ:**	February 8, 2019
City/County:	Brownsville, Cameron County	**Date Received by Reviewer:**	February 21, 2019
Physical Location:	1 Rocket Road		

CONTACT INFORMATION					
Responsible Official/ Primary Contact Name and Title:	Mr. Matthew Thompson Director, Environmental Health & Safety	**Phone No.:**	(310) 970-3611	**Email:**	matthew.thompson@spacex.com
Technical Contact/ Consultant Name and Title: Same as above					

GENERAL RULES CHECK	**YES**	**NO**	**COMMENTS**
Is confidential information included in the application?		x	
Has the PBR fee been paid?	x		Receipt #582EA000332436
Is this registration certified?	x		PI-7-CERT
Is this an APWL site?		x	
Are there any upstream or downstream affects associated with this registration?		x	
Is planned MSS included in the registration?		x	
Are there affected NSR or Title V authorizations for the project?		x	
Is each PBR > 25/250 tpy?		x	
Are PBR sitewide emissions > 25/250 tpy?		x	
Are there permit limits on using PBRs at the site?		x	
Is PSD or Nonattainment netting required?		x	
Do NSPS, NESHAP, or MACT standards apply to this registration?	x		MACT ZZZZ, NSPS IIII
Does NOx Cap and Trade apply to this registration?		x	
Is the facility in compliance with all other applicable rules and regulations?	x		

DESCRIBE OVERALL PROCESS AT THE SITE

Space Exploration Technologies Corporation (SpaceX) owns and operates the SpaceX Texas Launch Site.

DESCRIBE PROJECT AND INVOLVED PROCESS

SpaceX submitted a Form PI-7-CERT to certify the emissions from a Caterpillar GS3516 Tier 4 diesel generator (EPN: GEN1) under 106.512.

SpaceX wishes to add an electric generating unit to provide additional charge to a Tesla battery bank which is primarily charged by a solar array. Additionally, the generator will occasionally be used during peak launch flow to supplement power to meet demand. The generator will be located in a remote location making access to the grid neither readily available nor economically feasible.

TECHNICAL SUMMARY - DESCRIBE HOW THE PROJECT MEETS THE RULES

30 TAC §106.512 RULE CHECK

REQUIREMENTS	Y, N, or n/a	OTHER / COMMENTS
(1) Engine is registered with a PI-7-CERT within 10 days of the start of construction.	Y	Horsepower of engine = 790
(1) Table 29 was submitted for each proposed gas or liquid fuel-fired stationary internal combustion reciprocating engine.	Y	
(2) Any engines >500-hp will meet requirements of subparagraphs (A) - (C) of this paragraph.	Y	
(2)(A) Emissions of nitrogen oxides (NO_x) will not exceed the following limit:	Y	Actual NOx Emissions = 2.312 g/hp-hr
(2)(A)(vi) 11.0 g/hp-hr for any compression-ignited liquid-fired engine.	Y	
(2)(B) The engine requires an automatic air-fuel ratio (AFR) controller in order to meet the NOx limits in subparagraph (2)(A).	N	

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(2)(B) The engine requires an automatic air-fuel ratio (AFR) controller in order to meet the following requirements: An AFR controller shall be deemed necessary for any engine controlled with a non-selective catalytic reduction (NSCR) converter and for applications where the fuel heating value varies more than ± 50 British thermal unit/standard cubic feet from the design lower heating value of the fuel. If an NSCR converter is used to reduce NO_x, the automatic controller shall operate on exhaust oxygen control.	N	
(2)(C) Records specified in (2)(C) of this PBR will be created and maintained by the owner or operator for a period of at least two years, made available, upon request, to the commission and any local air pollution control agency having jurisdiction.	Y	
(3) Any gas turbine rated greater than 500-hp will meet the requirements of subparagraphs (A) and (B) of this paragraph.	n/a	No turbines
(4) Any engine or turbine rated less than 500 hp or used for temporary replacement purposes is exempt from the emission limitations of paragraphs (2) and (3) above.	n/a	Horsepower = 790 Temporary? No
(5) Gas fuel will be limited to: sweet natural gas or liquid petroleum gas, fuel gas containing ≤10 grains total sulfur per 100 dry standard cubic feet, or field gas.	Y	Type of fuel = Liquid Fuel Sulfur content of fuel gas: 0.0015 gr/100 dSCF
(6) Compliance with National Ambient Air Quality Standard (NAAQS) in the area of the proposed facility has been demonstrated.	Y	Method used (A, B, or C)? C
(6)(C) Distance to from all existing and proposed facilities on the property to the nearest property line was used to demonstrate NAAQS: The total emissions of NO_x (nitrogen oxide plus NO_2) will not exceed the most restrictive of the 250 tpy or the value (0.3125 D) tpy, where D equals the shortest distance in feet from any existing or proposed stack to the nearest property line.		

Distance to nearest Property Line (D) (feet)	Allowable NOx Emission Rate (tpy) 0.3125 X D	Actual NOx emissions (tpy)	Is Actual Emission Rate less than Allowable Emissions Rate?
30	9.375	2.01	YES

(7) The engine or turbine will not be used to generate electricity.	N	
(7) If NO to the above question, do any of the following apply? (A) The engines or turbines are used to provide power for the operation of facilities registered under the Air Quality Standard Permit for Concrete Batch Plants; (B) The engines or turbines satisfy the conditions for facilities permitted by rule under Subchapter E of this title (relating to Aggregate and Pavement); (C) The engines or turbines are used exclusively to provide power to electric pumps used for irrigating crops. **(D) The engine is for onsite use only and it is located where the electric grid is not readily available or where it is not economically feasible to connect to the electric grid**.	Y	The generator will be located in a remote location making access to the grid neither readily available nor economically feasible.

COMMUNICATION LOG

Date	Time	Name/Company	Subject of Communication
3/4	3:41 pm	Rajiv Y. Patel, P.E., Managing Engineer (*Greenthink Consulting,* LLC)	Email: "The narrative in the application states that the engine will be operated 2000 hours/year, however, the emissions were calculated at 1000 hours/year. Please explain. You demonstrated compliance with annual NO2 NAAQS using the 'property line distance' method, but the 1-hour NO2 NAAQS standard can only be demonstrated by modeling. • The new 1-hour NO2 NAAQS of 188 ug/m3 and annual NO2 NAAQS of 100 ug/m3 are the standards that must be met. • EPA screening models are available at: http://www.epa.gov/scram001/dispersion_screening.htm. You can use the 0.08 factor to convert one hour engine impacts to annual impacts before adding background. Don't forget to convert the NOx emissions to NO2 by the NO2/NOx ratio in 106.512(6)(A). You do not need to do respond with any additional information, but the company must be aware of the 1-hour NO2 NAAQS."

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COMMUNICATION LOG			
3/8	10:40 am	Rajiv Patel	Email reply: "Sorry for the delay in getting back with you! The emissions based on 1,000 hours are correct. The 2,000 hours in the process description is a typo. Please let me know if you need a revised process description write-up. Thanks for the note and guidance on the 1-hour NO2 NAAQS. We will maintain screen modeling records to demonstrate compliance with the 1-hour NO2 NAAQS. You do not need me to send anything, correct? For my own education in case I ever need to authorize under this PBR again, I thought I met the requirements of 6(C) by using the property distance line method. Is it implied or was additional guidance put out stating that screen modeling needs to be conducted to meet condition 6? *(6) There will be no violations of any National Ambient Air Quality Standard (NAAQS) in the area of the proposed facility. Compliance with this condition shall be demonstrated by one of the following three methods:* *(A) ....* *(B) ....* *(C) the total emissions of NO_x (nitrogen oxide plus NO_2) from all existing and proposed facilities on the property do not exceed the most restrictive of the following:* *(i) 250 tpy;* *(ii) the value (0.3125 D) tpy, where D equals the shortest distance in feet from any existing or proposed stack to the nearest property line.*"
3/11	9:00 am	Rajiv Patel	Spoke with consultant about NAAQS annual and the new 1-hr. Company will maintain screen modeling records to demonstrate compliance with the 1-hour NO2 NAAQS.

ESTIMATED EMISSIONS

EPN / Emission Source	VOC		NOx		CO		PM		PM10/PM2.5		SO2		HCHO (in VOC total)	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
GEN1: Generator 1	0.13	0.06	4.03	2.01	1.17	0.58	0.09	0.05	0.09	0.05	0.01	<0.01	0.02	0.01
TOTAL EMISSIONS (TPY):		**0.06**		**2.01**		**0.58**		**0.05**		**0.05**		**<0.01**		**0.01**

MAXIMUM OPERATING SCHEDULE (Hours/Year): 1000

SITE REVIEW/DISTANCE LIMIT	Y	N	Description/Outcome	Date	Reviewed by
Site Review Required?		x		3/4	Ms. Donna Wurst
PBR Distance Limits Met?	x		30' to property line and 436' to receptor.	3/4	Ms. Donna Wurst

	TECHNICAL REVIEWER	PEER REVIEWER	FINAL REVIEWER
SIGNATURE:			
PRINTED NAME:	Ms. Donna Wurst	Ms. Kristyn Campbell	Mr. Mark Meyer, Manager
DATE:	March 13, 2019	March 14, 2019	March 15, 2019