METROPOLITAN GOVERNMENT of NASHVILLE and DAVIDSON COUNTY
Metropolitan Health Department
Pollution Control Division
2500 Charlotte Avenue
Nashville, Tennessee 37209
Telephone: (615) 340-5653
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PERMIT TO CONSTRUCT OR MODIFY AN AIR POLLUTANT SOURCE

Permittee (Company Name): **Tennessee Gas Pipeline Company, LLC – Compressor Station 563**

Permit Number: **C-3123**

Installation Address: **7650 Whites Creek Pike**

Date of Issuance: **June 23, 2017**

City, State: **Joelton, Tennessee**

Designated Representative: **Thomas C. Dender**
Title: **Vice President, Operations**

Emission Source Number: **001**

NAICS Code: **486210**

Emission Source Description: **Two Solar Titan 250-30000S natural gas-fired compressor turbines. The two natural gas turbines are each rated at 207.8 MMBtu per hour (29,766 hp).**

Permit Conditions:

(1) This permit, issued in accordance with Section 10.56.020, "Construction Permits" of Chapter 10.56, "Air Pollution Control" of the Metropolitan Code of Laws (MCL), allows the operation of the air pollutant source described above.

(2) This permit shall serve as a temporary operating permit for a period of time not to exceed 180 days after startup, provided that this Agency is notified in writing of the date of startup. The notification must be submitted to this Agency in writing within five (5) working days of the date of startup.

(3) Semi-annual Progress Reports (SAR) must be submitted to this Agency for construction projects extending over a six-month period. The reports must specify the percent of the project completed and give an estimated completion date. The first Progress Report is due six months after the date of issuance of this permit and additional reports are due every six months thereafter until construction is complete and this office has been notified of the startup date.

(4) This permit shall become null and void if construction has not commenced within one (1) year of the date of issuance.

(5) This permit is not transferable and must be posted or filed on the premises for which it was issued.

(6) The following emission points are covered by this permit and are subject to the emission standards and operating schedule limitations outlined below. The allowable emission standards for all criteria pollutants not listed below are 0.0 pounds per hour, except for those sources that are exempt from permitting in accordance with Section 10.56.050, "Exemptions" of Chapter 10.56, "Air Pollution Control" of the MCL.

(Conditions continued on next page)

Permission has been granted to maintain and operate the aforementioned equipment or process in Davidson County, Tennessee, under and in accordance with any applicable statutes, ordinances, regulations, or other provisions of law including additions, deletions or modifications which may be hereafter enacted or promulgated.

Conditions continued for Construction Permit C-3123.

(6) Continued:

		Mass Emission Standards			Visible	Operating Schedule	
Emission Point	Pollutant	Lb/Hr	Lb/Day	Ton/12 Mo. (Rolling)	Emission Standard	Hr/Day	Hr/Year
101	PM_{10}	1.37	32.9	6.01	10%	24	8,760
	SO_2	0.71	16.9	3.09			
	NO_x	11.3	272	50.0			
	CO	11.5	276	53.8			
	VOC	1.32	31.7	5.76			
102	PM_{10}	1.37	32.9	6.01	10%	24	8,760
	SO_2	0.71	16.9	3.09			
	NO_x	11.3	272	50.0			
	CO	11.5	276	53.8			
	VOC	1.32	31.7	5.76			

Emission Point 101 – (563-A-01) - Solar Titan 250 30000S Natural Gas Compressor Turbine rated at 207.8 MMBtu per hour (29,766 hp)
Emission Point 102 – (563-A-02) - Solar Titan 250 30000S Natural Gas Compressor Turbine rated at 207.8 MMBtu per hour (29,766 hp)

(7) For each turbine, a daily log of operating hours, daily inventory of the volume of fuel burned, a record of each start-up and shutdown event, and a continuous record of turbine loading must be maintained on site and made available for inspection upon request. Past records must be maintained for at least five years.

(8) Prior to startup of the turbines, the facility must propose a recordkeeping program, to be approved by the Air Pollution Control Division, which ensures accurate estimation of actual emissions. The plan will incorporate a combination of the volume of fuel burned, appropriate emission factors, and the turbine loading under each of the dry low-NO_x operating scenarios.

(9) The mass emission standards outlined in Condition (6) are based on the proposed mass emission rates reported in the permit application dated September 15, 2015 and revised permit application forms dated November 7, 2016, for the purpose of calculating annual emission fees based on annual permitted allowable emissions in accordance with MCL 10.56.080. The mass allowable emissions are based on the following emission factors:

	Gas Turbines 563-A-01 & 563-A-02			
	Natural Gas			
Pollutant	Emission Factor (Lb/MMBtu)	Start-up Emissions (Lb/Event)	Shutdown Emissions (Lb/Event)	Emission Factor Reference
PM_{10}	0.00660	-	-	AP-42, Section 3.1 dated 4/00
SO_2	0.00340	-	-	AP-42, Section 3.1 dated 4/00
NO_x	0.055	2.60	2.90	Manufacturer Performance Data
CO	0.055	26.2	19.1	Manufacturer Performance Data
VOC	0.00628	0.34	0.28	Manufacturer Performance Data

(10) The gas turbines are permitted to burn natural gas only. The potential emission rates for the gas turbines are based on the emission factors outlined in Condition (9), a natural gas heating value of 1,020 Btu per cubic foot, and a total combined maximum natural gas burning rate of 407,442 cubic feet per hour, 9.78×10^6 cubic feet per day, and a combined total of $3,569 \times 10^6$ cubic feet per rolling twelve months. Estimated emissions from start-up and shutdown events are based on 150 start-up events and 150 shutdown events per turbine per rolling twelve months.

Conditions continued for Construction Permit C-3123.

(11) The gas turbines are subject to MCL 10.56.260, "Process Emissions," which limits emissions of particulate matter to no more than 0.25 grains per dry standard cubic foot (dscf). This emission limit has been streamlined into the more stringent standards outlined in Condition (6) of 1.37 lbs. per hour (0.0005 grains per dscf) for Emission Point 101 and 102, respectively. This section also limits emissions of sulfur oxides to no more than 500 ppmv. These emission limits have been streamlined into the more stringent standards outlined in Condition (6) of 0.71 lb. per hour (0.213 ppmv) for Emission Point 101 and 102, respectively.

(12) The gas turbines are subject to 40 CFR Part 60, Subpart KKKK - *Standards of Performance for Stationary Gas Turbines*. Subpart KKKK requires the following:

(a) §60.4320 states the emission limit for NO_x must not exceed 25 ppm at 15 percent O_2 or 150 ng/J of useful output (1.2 lb/MWh) or 26.64 lb per hour;

(b) §60.4330 outlines the emission limits for SO_2 and the following requirements:

(i) The permittee must not cause to be discharged into the atmosphere from the subject stationary combustion turbine any gases which contain SO_2 in excess of 110 nanograms per Joule (ng/J) (0.90 pounds per megawatt-hour (lb/MWh)) gross output or 19.98 lb. SO_2 per hour; or

(ii) The permittee must not burn in the subject stationary combustion turbine any fuel which contains total potential sulfur emissions in excess of 26 ng SO_2/J (0.060 lb SO_2/MMBtu) heat input or 12.47 lb. SO_2 per hour. If the turbine simultaneously fires multiple fuels, each fuel must meet this requirement.

(c) §60.4333 states the permittee must operate and maintain the stationary combustion turbine, air pollution control equipment, and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunction;

(d) §60.4340 states the permittee must perform annual performance tests in accordance with §60.4400 to demonstrate continuous compliance. If the NO_x emission result from the performance test is less than or equal to 75 percent of the NO_x emission limit for the turbine, the permittee may reduce the frequency of subsequent performance tests to once every 2 years (no more than 26 calendar months following the previous performance test). If the results of any subsequent performance test exceed 75 percent of the NO_x emission limit for the turbine, the facility must resume annual performance tests. As an alternative to testing, §60.4340(b) states any lean premix stationary combustion turbine may continuously monitor the appropriate parameters to determine whether the unit is operating in low-NO_x mode;

(e) §60.4355 states that parameters that are continuously monitored as described in §60.4340 must be monitored during the performance test required under §60.8, to establish acceptable values and ranges. The permittee may supplement the performance test data with engineering analyses, design specifications, manufacturer's recommendations and other relevant information to define the acceptable parametric ranges more precisely. The permittee must develop and keep on-site a parameter monitoring plan according to the requirements outlined in §60.4355(a)(1)-(6) which explains the procedures used to document proper operation of the NO_x emission controls;

(f) §60.4360 states the permittee must monitor the total sulfur content of the fuel being fired in the turbine, except as provided in §60.4365. The sulfur content of the fuel must be determined using total sulfur methods described in §60.4415. Alternatively, if the total sulfur content of the gaseous fuel during the most recent performance test was less than half the applicable limit, ASTM D4084, D4810, D5504, or D6228, or Gas Processors Association Standard 2377 (all of which are incorporated by reference, see §60.17), which measure the major sulfur compounds, may be used;

Conditions continued for Construction Permit C-3123.

(12) Continued:

(g) §60.4365 states the facility is exempt from monitoring the total sulfur content of the fuel if the fuel is demonstrated to not exceed potential sulfur emissions of 26 ng SO_2/J (0.060 lb. SO_2/MMBtu) heat input. In order to make this demonstration, the facility may use a current, valid purchase contract, tariff sheet or transportation contract for the fuel, specifying that the maximum total sulfur content for natural gas is 20 grains of sulfur or less per 100 standard cubic feet;

(h) For gaseous fuel, §60.4370(b) states if the permittee elects not to demonstrate sulfur content using options in §60.4365, and the fuel is supplied without intermediate bulk storage, the sulfur content value of the gaseous fuel must be determined and recorded once per unit operating day;

(i) §60.4375(a) states that for each affected unit required to continuously monitor parameters or emissions, or to periodically determine the fuel sulfur content under this subpart, the permittee must submit reports of excess emissions and monitor downtime, in accordance with §60.7(c). Excess emissions must be reported for all periods of unit operation, including start-up, shutdown, and malfunction. §60.4375(b) states that for each affected unit that performs annual performance tests in accordance with §60.4340(a), the permittee must submit a written report of the results of each performance test before the close of business on the 60th day following the completion of the performance test;

(j) Within sixty days after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial startup of such facility, each gas turbine must be tested to demonstrate compliance with the NO_x emission limits outlined in this permit according to the testing requirements outlined in§60.4400. In part, the compliance test must include at least the following:

(i) Each gas turbine must be tested to demonstrate compliance with the NO_x emission standards of 25 ppm at 15 percent O_2 or 150 nanograms per joule (ng/J) (1.2 lb. per MWh) of useful output while the gas turbine is operating at any load condition within plus or minus 25 percent of 100 percent of peak load. The permittee may perform testing at the highest achievable load point, if at least 75 percent of peak load cannot be achieved in practice. The permittee must conduct three separate test runs for each performance test. The minimum time per run is 20 minutes. The two general methodologies for determining NO_x concentration are outlined in §60.4400(a)(1);

(ii) However, in order to establish compliance with the requirements of Regulation No. 14, as outlined in Condition (20), each gas turbine must also be tested to confirm compliance with the manufacturer guaranteed NO_x emission limit of 9 ppm at 15 percent O_2 for an operating load between 80 and 100 percent. The source must conduct three separate test runs for each performance test. The minimum time per run is 20 minutes. The two general methodologies for determining NO_x concentration are outlined in §60.4400(a)(1). Compliance with this requirement will also demonstrate compliance with the emission standard requirement of Subpart KKKK;

(iii) Compliance with the applicable emission limit in §60.4320 must be demonstrated at each tested load level. Compliance is achieved if the three-run arithmetic average NO_x emission rate at each tested level meets the applicable emission limit in §60.4320;

(iv) The ambient temperature must be greater than 0^o F during the performance test; and

(v) This office must be notified at least thirty days prior to any performance test so a representative of the Pollution Control Division may be present.

Conditions continued for Construction Permit C-3123.

(13) This source is subject to MCL 10.56.170, "Emission of Gases, Vapors or Objectionable Odors" of Chapter 10.56 which states no person shall cause, suffer, allow or permit any emission of gases, vapors or objectionable odors beyond the property line from any source whatsoever which causes injury, detriment, nuisance or annoyance to any considerable number of persons or to the public, or which causes or has a natural tendency to cause injury or damage to business or property.

(14) This source is subject to MCL 10.56.270, "Visible Emissions," of Chapter 10.56 which restricts visible emissions from each emission point to 20 percent opacity. This requirement has been streamlined into the more stringent standard of 10 percent opacity outlined in Condition (6). Compliance with the visible emission standard will be ensured through the combustion of natural gas only.

(15) This source is subject to Section 10.56.280, "Start-ups, Shutdowns and Malfunctions" of Chapter 10.56 which, in part, requires the source to take all reasonable measures to keep emissions to a minimum during start-ups, shutdowns and malfunctions. Failures that are caused entirely or in part by poor maintenance, careless operation, or other preventable upset condition or preventable equipment breakdown shall not be considered a malfunction and shall be considered a violation of the applicable emission standards.

(16) This source is subject to Regulation No. 7, "Regulation for Control of Volatile Organic Compounds" of the MCL. This source will comply with this regulation by implementing good combustion practices while operating the gas turbines and burning only pipeline grade natural gas as fuel in the gas turbines.

(17) This facility is subject to Regulation No. 11, "Emergency Episode Regulation" of the MCL, which establishes criteria so as to prevent undesirable levels of air contaminants during adverse meteorological conditions. Major sources must submit to the Director an acceptable air pollution episode emissions reduction plan to be followed during the alert, warning, and emergency levels of an air pollution episode.

(18) This facility is subject to Regulation No. 13, "Part 70 Operating Permit Program" of the MCL based on the facility having the potential to emit greater than 100 tons of NO_x and CO annually.

(19) Any compliance testing shall be conducted in accordance with the requirements of MCL 10.56.300, "Testing Procedures."

(20) The facility has the potential to emit 100 tons per year or more of NO_x and is, therefore, subject to MCL Regulation No. 14, which requires the use of Reasonably Achievable Control Technology (RACT) in controlling NO_x emissions. The Pollution Control Division has determined that good operating practices and the use of dry-low NO_x combustion technology in the gas turbines, which are designed to meet a manufacturer guarantee NO_x emission limit of 15 ppm at 15% O_2 for operating loads between 40-80% and 9 ppm at 15% O_2 for operating loads between 80-100%, will satisfy the RACT requirements of MCL 14-2.

(21) The allowable facility wide hazardous air pollutant (HAP) emission rate is restricted to less than 10.0 tons per year of any one HAP and less than 25.0 tons per year of any two or more HAPs as identified in Section 112(b) of the 1990 Clean Air Act Amendment.

(22) One or more on-site inspections will be conducted during the temporary permitting period in order to ensure compliance with the conditions of this permit.