



**west virginia department of environmental protection**

Division of Air Quality  
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Earl Ray Tomblin, Governor  
Randy C. Huffman, Cabinet Secretary  
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**ENGINEERING EVALUATION / FACT SHEET**

**BACKGROUND INFORMATION**

Application No.: G65-C554 (Class I Emergency Generator)  
Plant ID No.: 039-00154  
Applicant: Columbia Gas Transmission, LLC (Columbia Gas)  
Facility Name: Charleston Headquarters Building  
Location: 1700 MacCorkle Ave., SE., Charleston, Kanawha County, WV  
Mailing Address: 1700 MacCorkle Ave., SE., Charleston, WV 26330  
SIC Code: 4922 - Natural Gas Transmission  
NAICS Code: 486210 - Pipeline Transfer of Natural Gas  
Application Type: After-the-fact Construction (July 6, 2015)  
Received Date: August 18, 2015  
Assigned Date: August 19, 2015  
Engineer Assigned: John Legg  
Fee Amount: \$250.00  
Date Fee Received: August 18, 2015  
Complete Date: August 19, 2015  
Due Date: October 5, 2015  
UTM's: Easting: 445.34 km Northing: 4,243.09 km Zone: 17  
Latitude: 38.33541 Longitude: -81.62467  
Description: This registration supercedes and replaces permit R13-2342. Construction/installation of a natural gas-fueled Cummins Inc. QSX15-G9 (563 kW; 755 bhp) emergency generator to be used to produce electrical power in the event of an electrical outage at Columbia Gas' Charleston Headquarters Building located in Charleston, WV. Note that this Class I General Permit required no public notice.

**BACKGROUND INFORMATION**

On August 18, 2015, Columbia Gas submitted application G65-C554 for the construction of a natural gas-fired Cummins (755 bhp) emergency generator. Columbia Gas' application fee (\$250.00) was received on August 19, 2015. The new emergency generator was constructed on July 6, 2015 at Columbia Gas' Charleston Headquarters Building located at 1700 MacCorkle Ave., SE. Charleston, WV 25314. The generator permitted under R13-2342 is no longer located at the site; This registration supercedes and replaces permit R13-2342.

## PROCESS DESCRIPTION

The emergency generator will be operated in the event of a power failure or during maintenance/testing of the generator. Under the G65-C general registration, the generator/engine will be allowed to operation a maximum of 500 hours per year.

**Table 1: Information on Emergency Generator Set/Engine (G2) Installed at Columbia Gas' Charleston Headquarters Building located in Charleston, Kanawha County, WV.**

Emergency Generator Engine G2	
Source ID No.	G2
Generator Manufacturer	Cummins Inc
Generator Model	DFEK
Engine Manufacturer	Cummins Inc
Engine Model	QSX15-G9 (755 bhp)
Engine Manufactured Date	No Given
Manufacturer's Rated hp/rpm	755/1800
Installation Date	July 6, 2015
Is this a Certified Stationary Compression Ignition Engine according to 40 CFR 60 Subpart IIII?	Yes
Engine Type	LB4S (Lean Burn 4 Stroke)
APCD Type	Not Applicable
Fuel Type	#2 Fuel Oil
H <sub>2</sub> S (gr/100 scf)	De minimis
Operating Hours	≤ 500 hr/yr
BSFC (Btu/bhp-hr)	6,242
Heat Input	4.71 MM Btu/hr
Fuel Consumption	34.4 gal/hr
	17,200 gal/yr
EPA Certificate Number	FCEXL015.AAJ-011
EPA Engine Family (Cummins Emissions Family)	FCEXL015.AAJ (J103)

G65-C554  
Columbia Gas Transmission, LLC  
General Office Building  
Charleston, Kanawha County, WV

## SITE INSPECTION

The facility's location is available to DAQ Enforcement who may or may not choose to inspect the facility in the future.

According to the application (General Permit Registration Section, entry 14A, page 2 of 5) the site is located at:

From the city of Charleston, head southwest for 0.4 miles on Dickinson Street, which turns into S. Side Bridge. Turn right onto Creed Ave, then right onto MacCorkle Ave, SE. In 0.2 miles, make a left onto 19<sup>th</sup> St. SE, then turn left at the 1<sup>st</sup> cross street toward MacCorkle Ave. In approximately 0.2 miles, the facility will be on the right.

## ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The writer checked Columbia Gas' emissions calculations and found them to be corrected. Emissions are summarized below in Table 2.

<b>Table 2: Emissions from Columbia Gas' Emergency Generator Engine to be Installed at their Charleston Headquarters Building located in Kanawha County, WV.</b>				
<b>Pollutant</b>	<b>Emission Factors</b>		<b>(lb/hr)<sup>(3)</sup></b>	<b>(ton/500 hr)</b>
Nitrogen Oxides (NO <sub>x</sub> )	3.10 <sup>(1)(2)</sup>	(g/hp-hr)	5.15	1.29
Carbon Monoxide (CO)	0.40 <sup>(1)</sup>	(g/hp-hr)	0.67	0.17
Volatile Organic Compounds (VOC)	0.80 <sup>(1)(2)</sup>	(g/hp-hr)	1.34	0.33
SO <sub>2</sub>	0.004 <sup>(4)</sup>	(g/hp-hr)	0.007	0.002
PM	0.080 <sup>(1)</sup>	(g/hp-hr)	0.13	0.033
PM <sub>10</sub> / PM <sub>2.5</sub>	0.102 <sup>(3)</sup>	(g/hp-hr)	0.17	0.042
Benzene	0.000776	(lb/MMBtu)	0.00365	0.0009
Formaldehyde	0.0000789 <sup>(5)</sup>	(lb/MMBtu)	0.0004	0.0001
(1) Emission factors for NO <sub>x</sub> , CO, VOC (as HC), and PM provided by engine manufacturer, based on CARB test results. (2) Emission factors for NO <sub>x</sub> calculated as 79.4% of NO <sub>x</sub> + NMHC total; VOC factor is 20.6% of NO <sub>x</sub> + NMHC total. (3) PM <sub>10</sub> /PM <sub>2.5</sub> from vendor specification plus condensable PM based on AP-42 Table 3.4-2. Unit conversion → g/hp-hr = lb/MM Btu/hr x 453.59 g/lb /hp (4) SO <sub>2</sub> calculations based on 7.05 lb/gal and specified fuel sulfur content of 0.0015% S. (5) From AP-42 Section 3.4 Table 3.4-3 - Dated 10/96. Unit conversion → lb/hr = lb/MM Btu X 4.71 MM Btu/hr				

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## **GENERAL PERMIT ELIGIBILITY**

The construction and operation of the engine/generator set meets the applicability requirements as specified in the Class I General Permit G65-C (Section 2.3.1) issued May 21, 2009. Therefore the facility is subject to Sections 1, 2, 3, and 4 (of the Class I General Permit G65-C) and this is stated at the top of page 2 in the general permit registration for G65-C554.

The generator engine is considered to be a reciprocating Internal Combustion Engines (R.I.C.E.), i.e., Section 5 of the Class I General Permit (G65-C) applies and this box is checked at the top of the general permit registration for G65-C545.

The generator is fueled by #2 fuel oil supplied from an 850 gallon sub-base tank. No other fuel storage tank information was submitted in the application. Because the fuel storage tank is small, Section 6 (Tanks) of the Class I General Permit (G65-C) does not apply and the box is not checked as the top of the general permit registration for G65-C554.

The generator engine is subject to 40 CFR 60 Subpart IIII because the engine is a compression ignition engine burning #2 fuel oil, i.e., Section 7 of the Class I General Permit (G65-C) does apply and the box is checked at the top of page 2 in the general permit registration for G65-C554.

The generator engine is not subject to 40 CFR 60 Subpart JJJJ because the engine is not a spark ignition engine, i.e., the indicator box for Section 8 (40CFR60 Subpart JJJJ) is not checked in the general registration G65-C554.

## **TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS**

Formaldehyde is emitted at very low levels from the combustion of natural gas:

Formaldehyde, a colorless, pungent-smelling gas, can cause watery eyes, burning sensations in the eyes and throat, nausea, and difficulty in breathing in some humans exposed at elevated levels (above 0.1 parts per million). High concentrations may trigger attacks in people with asthma. There is evidence that some people can develop a sensitivity to formaldehyde. It has also been shown to cause cancer in animals and may cause cancer in humans. Health effects include eye, nose, and throat irritation; wheezing and coughing; fatigue; skin rash; severe allergic reactions. May cause cancer. May also cause other effects listed under "organic gases."

Benzene, ethylbenzene, and toluene are also emitted at very low levels from the combustion of natural gas.

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**RECOMMENDATION TO DIRECTOR**

Columbia Gas' request for a permit for the installation and operation of a 755 HP emergency generator at their Charleston Headquarter's Building located at 1700 MacCorkle Ave., SE., Charleston, Kanawha County, WV 25314 meets the requirements of General Permit G65-C and all applicable rules, and therefore should be granted said General Permit Registration G65-C554.



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John Legg, Permit Writer

October 8, 2015

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Date

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