



west virginia department of environmental protection

Division of Air Quality
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Charleston, WV 25304
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Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
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**GENERAL PERMIT REGISTRATION APPLICATION
ENGINEERING EVALUATION / FACT SHEET**

BACKGROUND INFORMATION

Registration No.: G60-C083
Plant ID No.: 039-00007
Applicant: Bayer CropScience LP (Bayer)
Facility Name: Institute Site
Location: Institute, Kanawha County
SIC Code: 2879 - Pesticides and Agricultural Chemicals, Not Elsewhere Classified
2869 - Industrial Organic Chemicals, Not Elsewhere Classified
NAICS Code: 325320 - Pesticides and Other Agriculture Chemical Manufacturing
325199 - All Other Basic Organic Chemical Manufacturing
Application Type: Construction
Received Date: November 4, 2015
Engineer Assigned: John Legg
Fee Amount: \$1,500
Date Received: November 5, 2015
Complete Date: December 16, 2015 (Newspaper Affidavit Received)
Applicant Ad Date: November 12, 2015
Newspaper: *Charleston Gazette*
Permit Due Date: February 1, 2016
UTM's: Easting: 432.0 km Northing: 4,248.3 km Zone: 17
Lat/Long: Latitude: 38.389916° Longitude: -81.780037°
Description: Construction/installation of one (1), diesel-fueled emergency generator set. Generator will be equipped with a Cummins, Inc. Model QSX15-G9 engine rated at 680 bhp (507 kW) at 2,150 rpm. The generator will be used to supply electrical power for use at the Goff Mountain Landfill (GML) Operations Building during an electrical outage and will be operated a maximum of 500 hr/yr. The engine is EPA NSPS Tier 2 certified: EPA Certificate Number - FCEXL015.AAJ-011; EPA Engine Family (Cummins Emissions Family) - FCEXL015.AAJ(J103).

On November 4, 2015, the Division of Air Quality (DAQ) received Bayer's G60-C general permit registration application for the construction/installation of an emergency generator to provide temporary power at a new operations facility to be located at the Goff Mountain Landfill near the Institute Site, Institute, Kanawha County, WV.

Bayer paid the \$1,500.00 application fee on November 5, 2015. Their Class I legal advertisement ran in *The Charleston Gazette* on November 12, 2015. The original legal affidavit of publication for the newspaper advertisement was received via email at the DAQ on December 16, 2015.

Under this general registration (G60-C083), the generator/engine will be allowed to operation the customary maximum 500 hours per year.

PROCESS DESCRIPTION

The following process description came from Attachment B in the permit application:

Bayer CropScience proposes to install a Cummins Inc. DFEJ diesel Model QSX15-69 emergency generator set for use at Goff Mountain Landfill (“GML”) Operations Building. The Operations Building is presently being constructed with a projected startup date of January 15, 2016.

The GML Operations Building will include leachate holding tanks and all equipment and instrumentation required to operate and maintain these tanks. The building will also include a tank truck loading facility to transport landfill leachate to an off-site facility. In the event of a power loss, the generator will serve as the emergency power backup.

The generator will be cycled and tested to insure proper operation in the event of a power loss to the GML Operations Building.

Table 1: Information on Bayer’s Emergency Diesel-fired Generator Engine (EG-GML) located near the Institute Site, Institute, Kanawha County, WV. (See Permit Registration Application G60-C083, Attachment G: G60-C Registration Application Forms.)

Emergency Generator Engine (EG-GML)	
Source ID No.	EG-GML
Engine Manufacturer and Model	Cummins, Inc Model QSX15-G9
Manufacturer’s Rated bhp/rpm	680/2150
Source Status	New Source
Engine Manufactured Date	September 23, 205 (purchased date)
Is this a Certified Stationary Spark Ignition Engine according to 40 CFR 60, Subpart III?	Yes

Table 1: Information on Bayer's Emergency Diesel-fired Generator Engine (EG-GML) located near the Institute Site, Institute, Kanawha County, WV. (See Permit Registration Application G60-C083, Attachment G: G60-C Registration Application Forms.)

Emergency Generator Engine (EG-GML)	
Source ID No.	EG-GML
Engine Type	DFEJ
Air Pollution Control Device	None (Air/Fuel Ratio)
Fuel Type	#2 Fuel Oil/Diesel
Diesel Storage Tank	Source ID #: EG-GML-T Volume: 850 gallons Enclosed within Generator
H ₂ S (gr/100 scf)	---
Operating bhp/rpm	680 bhp /2150 rpm
Brake Specific Fuel Consumption (BSFC) (Btu/bhp-hr)	4,435 Btu/bhp-hr (calculated by writer)
Fuel Throughput	23.2 gal/hr (\approx 1/2 load) 36 gal/hr (\approx full load)
Fuel Throughput	11,600 gal/yr
Operating Hours	\leq 500 hr/yr
Fuel Value for Diesel (Btu/gal)	130,000 Btu/gal
Design Heat Input to Generator	3.02 MM Btu/hr

SITE INSPECTION

A site inspection was deemed unnecessary by the writer. Directions as given in the general permit registration application, section 1, 14.A:

The facility is located west of Institute, WV adjacent to State Route 25 and West Virginia State University.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

Low levels of toxic/hazardous non-criteria regulated pollutants are emitted from the combustion of No. 2 diesel in the generator engine. calculated HAP emissions (for acetaldehyde, acrolein, benzene, 1,3-butadiene, formaldehyde, naphthalene, toluene, and xylene; see permit application G60-C083, Attachment I: Emissions Calculations) for the generator engine using emission factors obtained from AP-42, Section 3.3, Table 3.3-2. Total HAP emissions were estimated at 0.06 lb/hr, 0.015 ton/yr based on 500 hrs/yr of operation, and 0.26 ton/yr based on unrestricted hours of operation (8,760 hr) per year. See Table 3 (below) for additional information on how HAP emissions were calculated.

CLASS II GENERAL PERMIT G60-C

Eligibility

The requirements and conditions of the G60-C general permit address the prevention and control of regulated pollutant emissions from emergency generators, including emergency generators installed at Title V (major) facilities and other facilities having additional point sources of emissions. The G60-C Emergency Generator General Permit benefits the regulated community by incorporating all air quality regulations into a single general permit. General Permit G60-C was issued May 21, 2009.

The proposed permitting of the emergency generator is eligible for a G60-C General Permit registration, i.e., it does meet the five (5) conditions given in 2.31 of G60-C and given below:

- a. The emergency generator(s) is not a major source as defined in 45CSR14, 45CSR19 or 45CSR30;
- b. The emergency generator(s) is not subject to 45CSR14, 45CSR15, 45CSR19, 45CSR25, 45CSR 27, or 45CSR34;
- c. Each emergency generator is to be operated 500 hours per year or less;
- d. The emergency generator(s) is not located in, nor will it (they) significantly impact, an area which has been determined to be a nonattainment area;
- e. The emergency generator(s) does not require an individual air quality permit review process and/or individual permit provisions to address the emission of a regulated pollutant or to incorporate regulatory requirements other than those established by General Permit G60-C.

Applicable Sections

All registered facilities under the Class II General Permit G60-C are subject to **Sections 1.0, 2.0, 3.0, and 4.0**. This is stated at the top of page 3 in the general permit registration.

- **Section 5:** Bayer's generator engine is a Reciprocating Internal Combustion Engine (R.I.C.E.) and therefore is subject to **Section 5** of the Class II General Permit G60-C. The Section

5 box in the general permit registration (Attachment G) was not "Xed" by Bayer, but should have been.

[Section 5 gives the basic requirements for any R.I.C.E. and is always checked regardless if the engine is subject to NSPS or not. G60-C (nor G65-C) does not cover facilities subject to 40 CFR 63, Subpart ZZZZ, "National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines" which gives the requirements for stationary engines at major sources of HAP.]

- **Section 6:** The generator engine will burn diesel fuel which is stored in an 850 gallon storage tank enclosed within the generator and is not a separate unit.

The **Section 6** box (in the permit application, Attachment G) was "Xed" by Bayer, **but according to G60-C, Section 6.1.1: tanks that are less than 20,000 gallons should not be permitted emissions, i.e., Bayer's diesel storage tank is too small to have permitable emissions.**

- **Section 7:** The generator engine is diesel fueled, and is subject to 40CFR60 Subpart IIII entitled "Standards of Performance for Stationary Compression Ignition Internal Combustion Engines" because the engine was manufactured after April 2, 2006. Bayer did check the **Section 7** box in Attachment G.

- **Section 8:** The generator engine (is diesel-fueled and) does not burn gasoline or propane. For that reason, the engine is not subject to 40 CFR 60, Subpart JJJJ entitled "Standards of Performance for Stationary Spark Ignition Internal Combustion Engines." The **Section 8** box in Attachment G was (correctly) not "Xed" by Bayer.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The writer reviewed Bayer's emission calculations (found in Attachment N of the permit application) and found the calculations to be logical and correct. Tables 2 (below) details how hourly and annual emission limitations for the emergency generator engine were calculated.

Table 2: Hourly and Annual Emission Calculations for Bayer's Emergency Generator Engine (Source ID# EG-GML; 507 kw; 680 BHP).						
Pollutant	Emission Factor			Engine Emissions		
	Factor	Units	Source	lb/hr	Limited ⁽¹⁾ ton/yr	Max. ⁽²⁾ ton/yr
NOx	3.90	g/hp-hr	2015 EPA Tier 2 Exhaust Emission Compliance Statement ⁽⁴⁾	5.85	1.46	25.61
CO	0.40	g/hp-hr		0.60	0.15	2.63
VOC	0.00247	lb/hp-hr	AP-42 Table 3.3-1	1.68	0.42	7.36
PM	0.08	g/hp-hr	2015 EPA Tier 2 Exhaust Emission Compliance Statement ⁽⁴⁾	0.12	0.029	0.525
SO2	0.002	lb/hp-hr	AP-42 Table 3.3-1	1.36	0.34	5.96
Total HAPs ⁽³⁾	0.00379	lb/MM Btu	AP-42, Table 3.3-2	0.06	0.014	0.24

(1) Based on operating the generator 500 hr/yr.
(2) Based on operating the generator 8,760 hr/yr.
(3) Bayer used a diesel fuel consumption rate of 112 gal/hr and a fuel Btu value of 130,000 Btu/gal. The writer believes that the diesel fuel consumption rate should be lower [between 23.4 ga/hr (~3/4 load) and 27.7 gal/hr (full load)] and that HAP emissions were over-estimated by Bayer.
(4) The engine is EPA NSPS Tier 2 certified: EPA Certificate Number - FCEXL015.AAJ-011; EPA Engine Family (Cummins Emissions Family) - FCEXL015.AAJ(J103).

RECOMMENDATION TO DIRECTOR

Bayer's request to construct and operate an emergency generator at a new operations facility at the Goff Mountain Landfill near its Institute Site in Institute, Kanawha County, WV meets the requirements of General Permit G60-C and all applicable rules and therefore Bayer should be granted said General Permit Registration G60-C083.



John Legg, Permit Writer

January 11, 2016 

Date