

DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION  
ACTIVITY REPORT: Scheduled Inspection

P026226609

FACILITY: BLUE WATER RENEWABLES		SRN / ID: P0262
LOCATION: 6797 SMITHS CREEK ROAD, SMITHS CREEK		DISTRICT: Southeast Michigan
CITY: SMITHS CREEK		COUNTY: SAINT CLAIR
CONTACT: David Terry , Facility Technician		ACTIVITY DATE: 08/25/2014
STAFF: Rebecca Loftus	COMPLIANCE STATUS: Non Compliance	SOURCE CLASS: Major
SUBJECT: See also SRN: N6207, Smiths Creek Landfill. Together these are one stationary source.		
RESOLVED COMPLAINTS:		

On August 25, 2014, Jill Zimmerman and I, Rebecca Loftus, from the Department of Environmental Quality's (DEQ), Air Quality Division (AQD) conducted an inspection Blue Water Renewables, LLC at Smiths Creek Landfill, State Registration Number (SRN): P0262, located at 6779 Smiths Creek Road, in Smiths Creek, St. Clair County, Michigan. The purpose of this inspection was to determine the Blue Water Renewables compliance with the Federal Clean Air Act Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act of 1994, PA 451, as amended, Michigan's Air Pollution Control Rules, and Renewable Operating Permit (ROP) number MI-ROP-P0262-2012.

We arrived on-site at the engine plant at 12:10pm and met with Dave Terry and Jeff Neumann, from DTE Biomass. Below is a summary of my findings during my inspection and file review.

### Facility Overview

Smiths Creek Landfill (SRN: N6207) is a Type II Sanitary Landfill, owned and operated by St. Clair County. Blue Water Renewables (operated by DTE Biomass, SRN:P0262) owns an electric generating facility located at the landfill that utilizes the landfill gas as fuel. Previously, an agreement was made between AQD management, St. Clair County, and Blue Water Renewables, which allowed the two entities to have separate ROPs and SRNs; together these entities comprise one single stationary source.

In 2009, Blue Water Renewables obtained Permit to Install (PTI) No. 163-09 for the operation of three reciprocating internal combustion engines (RICEs). This permit was subsequently rolled into ROP No. MI-ROP-P0262-2012. In addition, to the engines, Blue Water Renewables operated a landfill gas (LFG) treatment system which dewateres, filters, and compresses the LFG prior to combustion in the engines.

In addition to the on-site inspection of the engine plant and treatment system, AQD staff reviewed the following: the February 2013 Stack Test, HAP emissions (including Formaldehyde), NSPS JJJJ, NESHAP ZZZZ, and 2013 MAERS data.

### FGICENGINES

Flexible group, FGICENGINES, represents three RICEs. Engines #1 and #2 are CAT Model 3520C, 2,233 bhp, lean burn engines, installed in June 2011, and capable of producing 1.6 megawatts. Engine #3 was permitted as a CAT Model G3516, 1,148 bhp, lean burn engine, capable of producing 800 Kw. The flexible group has limits for NO<sub>x</sub>, CO, HCl, and NMOC. In addition Blue Water Renewables must monitor the LFG for H<sub>2</sub>S concentrations, calculate monthly SO<sub>2</sub> mass emissions, record operating hours of each engine, record the amount of

LFG consumed, properly operate and maintain an air/fuel ratio controller, record engine maintenance, and provide a Malfunction Abatement Plan.

At the time of my inspection, Mr. Terry explained Blue Water Renewables only installed Engines #1 (serial # GZJ00491) and #2 (serial # GZJ00493); the landfill does not currently produce enough LFG to operate the third engine. I noted that Engine #1 was only operating at 86% load and Engine #2 was operating at 88% load. Mr. Terry explained that due to the quantity of LFG, these engines typically run between 85-90% load and because of this, plans to install Engine #3 have been put on-hold indefinitely.

During my inspection, I recorded the following engine parameters:

	<b>Engine #1</b>	<b>Engine #2</b>
<b>Serial #</b>	GZJ00491	GZJ00493
<b>Engine Hours</b>	23810	23877
<b>Correction Factor %</b>	97	99
<b>LFG Btu</b>	465	460
<b>Fuel Temp( °F)</b>	87.8	89.6
<b>Fuel Pressure (psi)</b>	16.7	16.7
<b>Inlet Air Temp( °F)</b>	139.1	138.7
<b>Manifold Air Pressure (psi)</b>	40.4	40.5
<b>Air-Fuel Ratio</b>	8.4	8.1
<b>Air Flow (scfm)</b>	3837	3799
<b>Fuel Flow (scfm)</b>	453	467
<b>Oil Pressure (psi)</b>	69.5	66.9
<b>Oil Differential (psi)</b>	5.2	4.1
<b>Battery Voltage</b>	25.5	25
<b>Speed (RPM)</b>	1200	1200
<b>Throttle %</b>	54	53
<b>Load %</b>	86	88
<b>Coolant Temp ( °F )</b>	222	228
<b>Cylinder Temps ( °F )</b>	1000-1100*	1099-1150
<b>R Turbo Temp Out (°F)</b>	960	993
<b>R Turbo Temp In (°F)</b>	1223	1268
<b>R Turbo Temp Diff (°F)</b>	263	275
<b>L Turbo Temp Out (°F)</b>	9996	996
<b>L Turbo Temp In (°F)</b>	1243	1263
<b>L Turbo Temp Diff. (°F)</b>	277	267
*Engine #1 had one bad censor on cylinder censor, #10.		

All record keeping was available on-site at the time of my inspection. The H2S concentrations are taken monthly using dragger tubes. The reading on August 14, 2014, was 115 ppm.

Mr. Terry also provided me with blank copies of the daily record keeping forms (see attached) and later via email, provided all the daily and monthly records (see the attached CD for the data). Upon review of the records, I noted the engine parameter data was similar to the conditions I observed during my inspection.

The maintenance records for each engine (available on-site) indicated that each engine has had to "Top-ends". Mr. Terry explained the other types of maintenance activities performed as follows: At Blue Water Renewables, an "in-frame" includes a "Top-end" plus a change in the pistons, rods, cylinders, etc. When a "Major" rebuild occurs, the engine is taken off-site, rebuilt, and re-installed (no engine is in place while the maintenance occurs), therefore the engine maintains the same serial number.

The Malfunction Abatement/Preventative Maintenance Plans required by the permit were received by the AQD on August 23, 2012 (see file for plans).

In addition to the permit requirements, the engines are subject to the National Standards of Performance for Stationary Spark Ignition Internal Combustion Engines, 40 CFR Part 60 Subpart JJJJ (NSPS JJJJ) and the National Emission Standards for Hazardous Air Pollutant for Stationary Reciprocating Internal Combustion Engines, 40 CFR Part 63 Subpart ZZZZ (NESHAP ZZZZ). See sections below for more information on these federal regulations.

#### **EUTREATMENTSYS**

Typically EUTREATMENTSYS is operated by the landfill owner, however at Smiths Creek Landfill, Blue Water Renewables operates the LFG treatment system which filters particulate matter, remove moisture, and compress the LFG; designated in the ROP as EUTREATMENTSYS. These treatment systems are used to process the gas prior to it being sent to their two Reciprocating Internal Combustion Engines. Maintenance activities are kept on-site in a binder and any malfunctions are reported in the semiannual reports.

#### **Formaldehyde/ HAP emissions/Stack Test**

Aware of new engine emissions data, the AQD requested that Blue Water Renewables re-evaluate their Potential to Emit (PTE) for Hazardous Air Pollutants (HAPs), including formaldehyde. In lieu of using the updated CAT emission factors for their engines, DTE performed a stack test on February 7, 2013. Engine #2 was tested and the following emission factors for formaldehyde were reported in April 2013: 76.9 ppm and 1.9 lb/hr.

During my inspection, I requested the 12-month rolling emissions data for CO and Hazardous Air Pollutants (HAPs); noting that HAP emission calculations should include formaldehyde using the emission factors established during the Feb 2013 stack test.

On September 16, 2014, Nick Diedrich, provided the CO and HAP data and indicated that from approximately September 2013 forward, the facility's formaldehyde emissions exceeded their ROP limit for individual HAP emissions of 9 TPY; the 12 month rolling emissions as of August 2014 were calculated at 17.0 tons of formaldehyde (see attached email and records).

#### **NSPS JJJJ**

The two 3520 CAT Engines are subject to 40 CFR Part 60, Subpart JJJJ, the Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (NSPS JJJJ). On December 22, 2011, Blue Water Renewables submitted their Initial Notification for NSPS and on August 23, 2012 the required Engine Preventative Maintenance Plan (see file).

**NESHAP ZZZZ**

Before 2013, Blue Water Renewables was considered a minor source of HAPs. Given the new formaldehyde data, Blue Water Renewables is now consider a major source of HAPs and is subject to 40 CFR, Part 63, Subpart ZZZZ, the Nation Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (NESHAP ZZZZ).

The initial notification and annual reports for Blue Water Renewables as a major source of HAPs are past due.

**MAERS**

For 2013, Blue Water Renewables reported the following emissions:

Pollutant	Tons
CO	93.58
NOx	16.09
PM10	9.73
SO2	6.61
VOC	20.19

Note: Formaldehyde emissions from the engines were not included in the reported VOC emissions.

**Compliance Conclusions**

Based on the information gathered, Blue Water Renewables exceeded their ROP HAP limit and failed to comply with the requirements of NESHAP ZZZZ. A violation notice will be sent to address these violations.

NAME

*Rebecca J. [Signature]*

DATE

9/25/14

SUPERVISOR

CJE