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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3302
Plant ID No.:	081-00267
Applicant:	Seven Islands Environmental Solutions, LLC
Facility Name:	New River Facility
Location:	Beckley, Raleigh County
NAICS Code:	221118
Application Type:	Construction
Received Date:	March 8, 2016
Engineer Assigned:	Steven R. Pursley, PE
Fee Amount:	$4,500
Date Received:	March 9, 2016; June 17, 2016
Complete Date:	June 23, 2016
Due Date:	September 20, 2016
Applicant Ad Date:	March 10, 2016
Newspaper:	*Register Herald*
UTM's:	Easting: 485.50 Northing: 4,186.39 Zone: 17
Description:	Installation of a new 3.2 MW, landfill gas fired electric generating facility.

DESCRIPTION OF PROCESS

Seven Islands Environmental Solutions, LLC (SIES) is proposing to install two (2) Catepillar Model G3520c engine/generators to combust landfill gas captured from the landfill gas collection and control system at the Raleigh County Solid Waste Authority Landfill and to generate electricity. The proposed project includes routing gas from the existing landfill gas (LFG) blower/treatment system, where an existing LFG open flare is used to combust collected LFG, to the new engine/generator plant. SIES will lease land from the RCSWA to construct a building to house the engine gensets.

Once installed, the primary combustion device for the landfills collected LFG will be the SIES engine with the landfills existing 1,200 SCFG open flare serving as a backup control device.

Entire Document
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SITE INSPECTION

No site inspection was deemed necessary. Below is a google map satellite view of the proposed area. The facility will be located on the site of the existing Raleigh County Solid Waste Authority Landfill.

To get to the facility take I77 south to exit 48 and go 1.8 miles. Then take US 19 south approximately 3.3 miles and turn left on Ragland Road. Next, proceed 1.5 miles. Finally, turn left on Fernanadez Drive and follow the signs to the landfill entrance.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The only emissions that result from the facility are the by products of landfill gas combustion. NO_x, CO and VOC emissions are based on manufacturer information. PM emissions are based on AP-42. SO_2 emissions are based on a mass balance assuming all total reduced sulfur in the LFG is converted to SO_2. HAP emissions are based on HAP concentrations in landfill gas (as specified in AP-42). A destruction efficiency (93% for halogenated HAPs and 86.1% for non-halogenated HAPs) was then assumed for the combustion of the pollutants (AP-42 Section 2.4). Annual emissions were calculated based on the two generators operating a maximum of 15,260 combined hours per year. This limit was voluntarily taken by the applicant so as to keep CO emissions under 100 tons per year. **For the purposes of the following tables (and the permit) each individual genset will be permitted to operate 8,760 hours per year, but combined operation may not exceed 15,260 hours per year.**

	NO_x		CO		SO_2		$PM/PM_{10}/PM_{2.5}$		VOCs	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Genset 1	2.46	10.77	12.30	53.88	0.23	0.98	0.55	2.38	4.33	18.96
Genset 2	2.46	10.77	12.30	53.88	0.23	0.98	0.55	2.38	4.33	18.96
Total	**4.92**	**18.76**	**24.60**	**93.84**	**0.45**	**1.71**	**1.09**	**4.15**	**8.66**	**33.03**

	Toluene		Xylene		Total HAPs	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Genset 1	0.03	0.10	0.02	0.08	0.07	0.27
Genset 2	0.03	0.10	0.02	0.08	0.07	0.27
Total	**0.05**	**0.17**	**0.04**	**0.13**	**0.13**	**0.47**

REGULATORY APPLICABILITY

The following state and federal rules apply to the proposed facility:

STATE RULES

45CSR13 Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation).

The construction of the SIES facility has the potential to emit regulated pollutants (CO and VOCs) in excess of six (6) lbs/hour and ten (10) TPY and, therefore, pursuant to §45-13-2.24, the facility is defined as a "stationary source" under 45CSR13. Pursuant to §45-13-5.1, "[n]o person shall cause, suffer, allow or permit the construction . . . and operation of any stationary source to be commenced without . . . obtaining a permit to construct." Therefore, SIES is required to obtain a permit under 45CSR13 for the construction and operation of the facility.

As required under §45-13-8.3 ("Notice Level A"), SIES placed a Class I legal advertisement in a "newspaper of general circulation in the area where the source is . . . located." The ad ran on March 10, 2016 in the *Register Herald* and the affidavit of publication for this legal advertisement was submitted on June 3, 2016.

Since the facility will be a synthetic minor for Title V purposes, it will have to undergo Notice Level "C". Therefore, the applicant will have to place a commercial display ad per §45-13-8.4.a and post a sign at the entrance of the facility per §45-13-8.5.a

45CSR16 Standards of Performance for New Stationary Sources Pursuant to 40 CFR Part 60

45CSR16 applies to this source by reference of 40CFR60, Subpart JJJJ.

45CSR30 Requirements for Operating Permits

Because the facility is subject to 40CFR60 Subpart AAAA, it is subject to 45CSR30. However, since the facility is taking limits to keep emissions of all pollutants below major source thresholds, it will be a minor (deferred) source under the rule.

FEDERAL RULES

40CFR60 Subpart JJJJ Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

40CFR60 Subpart JJJJ sets forth emission limits, fuel requirements, installation requirements, and monitoring requirements based on the year of installation of the subject internal combustion engine. 40CFR60 Subpart JJJJ is applicable to owners and operators of new stationary spark ignition internal combustion engines manufactured after July 1, 2007, for engines with a maximum rated power capacity greater than 500 hp. The two proposed 2,233 hp engine will be subject to this rule. The emission limits for these engines are the following: NOx - 2.0 g/hp-hr; CO - 5.0 g/hp-hr; and VOC - 1.0 g/hp-hr). Based on the manufacturer's specifications for these engines, the emission standards will be met. SIES indicated in Attachment O and Attachment L of the application that the engines will be certified. Therefore no testing is required.

40CFR63 Subpart AAAA: National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills

40 CFR63 Subpart AAAA requires all landfills described in §63.1935 to meet the requirements of 40 CFR part 60, subpart Cc or WWW and requires timely control of bioreactors. This application does not address any bioreactors and, as described below in the Non-Applicability section, although the landfill is subject to Subpart WWW,

the LFG collection and control system is not. Therefore, although the facility is subject to the rule, there are no substantive requirements under the rule which apply to the project.

40CFR63 Subpart ZZZZ: National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines

Subpart ZZZZ establishes national emission limitations and operating limitations for HAPs emitted from stationary RICE located at major and area sources of HAP emissions. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations. Because the engines were constructed after June 6, 2006 they are new engines under Subpart ZZZZ. Therefore, to comply with ZZZZ the engines need only comply with 40 CFR 60 Subpart JJJJ.

NON-APPLICABILITY DETERMINATIONS

40CFR60 Subpart WWW Standards of Performance for Municipal Solid Waste Landfills

The landfill is subject to Subpart WWW, however, the landfill does not have non-methane organic compound (NMOC) emissions exceeding 50 MG at this time and , therefore, the LFG collection and control system is currently voluntary. However, the applicant has indicated that the landfill has installed a treatment system that will process the gas before entering the generator engines and that said system will meet the requirements of Subpart WWW. Therefore, the facility should be in compliance with the rule should the NMOC emissions from the landfill ever exceed 50 MG per year.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The only non-criteria regulated pollutants that will be emitted from the facility in substantive amounts (at least 0.01 pound per hour or 0.01 tons per year) are toluene and xylene.

Toluene:

The acute toxicity of toluene is low. Toluene may cause eye, skin, and respiratory tract irritation. Short-term exposure to high concentrations of toluene (e.g., 600 ppm) may produce fatigue, dizziness, headaches, loss of coordination, nausea, and stupor; 10,000 ppm may cause death from respiratory failure. Ingestion of toluene may cause nausea and vomiting and central nervous system depression. `Contact of liquid toluene with the eyes causes temporary irritation. Toluene is a skin irritant and may cause redness and pain when trapped beneath clothing or shoes; prolonged or repeated contact with toluene may result in dry and cracked skin. Because of its odor and irritant effects, toluene is regarded as having good warning properties. The chronic effects of exposure to toluene are much less severe than those of benzene. No carcinogenic effects were reported in animal studies. Equivocal results were obtained in studies to determine developmental effects in animals. Toluene was not observed to be mutagenic in standard studies. The major use

of toluene is as a mixture added to gasoline to improve octane ratings. Toluene is also used to produce benzene and as a solvent in paints, coatings, synthetic fragrances, adhesives, inks, and cleaning agents. Toluene is also used in the production of polymers used to make nylon, plastic soda bottles, and polyurethanes and for pharmaceuticals, dyes, cosmetic nail products, and the synthesis of organic chemicals.

Xylene:

Commercial or mixed xylene usually contains about 40-65% mxylene and up to 20% each of o-xylene and p-xylene and ethylbenzene. Xylenes are released into the atmosphere as fugitive emissions from industrial sources, from auto exhaust, and through volatilization from their use as solvents. Acute (short-term) inhalation exposure to mixed xylenes in humans results in irritation of the eyes, nose, and throat, gastrointestinal effects, eye irritation, and neurological effects. Chronic (long-term) inhalation exposure of humans to mixed xylenes results primarily in central nervous system (CNS) effects, such as headache, dizziness, fatigue, tremors, and incoordination; respiratory, cardiovascular, and kidney effects have also been reported. EPA has classified mixed xylenes as a Group D, not classifiable as to human carcinogenicity.

AIR QUALITY IMPACT ANALYSIS

Since this application involves the construction of a source that is not defined as major (per 45CSR14), no modeling was performed.

MONITORING OF OPERATIONS

In addition to the monitoring, recordkeeping and reporting required by §60.4245(a), the permit will also require SIES to monitor and record the hours of operation and gas usage of each generator engine.

RECOMMENDATION TO DIRECTOR

Information supplied in the application indicates that compliance with all applicable regulations will be achieved. Therefore it is the recommendation of the writer that permit R13-3302 for the construction of a landfill gas fired electric generating facility near Beckley, in Raleigh County, be granted to Seven Islands Environmental Solutions, LLC.

Steven R. Pursley, PE
Engineer

6-23-16

June 23, 2016