



DEPARTMENT ORDER

**Village Green Maine, LLC
Cumberland County
Brunswick, Maine
A-1086-71-C-A**

**Departmental
Findings of Fact and Order
Air Emission License
Amendment #1**

FINDINGS OF FACT

After review of the air emission license amendment application, staff investigation reports, and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 Maine Revised Statutes (M.R.S.) § 344 and § 590, the Maine Department of Environmental Protection (Department) finds the following facts:

I. REGISTRATION

A. Introduction

Village Green Maine, LLC (Village Green) was issued Air Emission License A-1086-71-A-N on January 13, 2014, for the operation of emission sources associated with their anaerobic digester/energy production facility.

Village Green has requested an amendment to their license in order to remove Boiler #1 and Flare #1 from their license, convert their combined heat and power (CHP) unit, CHP #1, to fire only pipeline natural gas, and to install the following pieces of equipment:

1. A second anaerobic digestion tank;
2. A second combined heat and power unit;
3. A new biogas flare;
4. An emergency generator; and
5. A thermal oxidizer for control of tailgas from the biogas to high BTU gas processing system.

The Department is also using this amendment as an opportunity to update the CHP #1 visible emissions limit. The equipment addressed in this license amendment is located on Orion Street, Brunswick Landing of the former Brunswick Naval Air Station in Brunswick, Maine.

B. Emission Equipment

The following equipment is addressed in this air emission license amendment:

Stationary Engines

<u>Equipment</u>	<u>Max. Input Capacity (MMBtu/hr)</u>	<u>Rated Output Capacity (kW)</u>	<u>Fuel Type, % sulfur</u>	<u>Firing Rate (scf/hr)</u>	<u>Date of Manuf.</u>	<u>Date of Install.</u>	<u>Stack #</u>
CHP #1	9.7	1,000	Natural gas, negl.	9,780	2014	2014	1
CHP #2*	9.92	1,200		9,720	2018	2018	6
EGEN #1*	1.55	150		1,515	2018	2018	7

*New in this license.

Village Green may operate small stationary engines smaller than 0.5 MMBtu/hr. These engines are considered insignificant activities and are not required to be included in this license. However, they are still subject to applicable State and Federal regulations. More information regarding requirements for small stationary engines is available on the Department's website at the link below.

<http://www.maine.gov/dep/air/publications/docs/SmallRICEGuidance.pdf>

Additionally, Village Green may operate portable engines used for maintenance or emergency-only purposes. These engines are considered insignificant activities and are not required to be included in this license. However, they may still be subject to applicable State and Federal regulations.

Process Equipment

<u>Equipment</u>	<u>Equipment Type</u>	<u>Material Input Rate</u>	<u>Process Output Rate</u>	<u>Pollution Control Equipment</u>
AD #1	Anaerobic Digester	220.8 ton/day of feedstock	≈700 scfm of biogas	Flare #2, TOX #1
AD #2*	Anaerobic Digester			

*New in this license.

Control Equipment

<u>Equipment</u>	<u>Equipment Controlled</u>	<u>Max. Capacity (MMBtu/hr)</u>	<u>Fuel Type, % sulfur</u>	<u>Date of Manuf.</u>	<u>Date of Install.</u>	<u>Stack #</u>
Flare #2*	AD #1/AD #2	39.8	Biogas, 0.08%	2018	2018	4
TOX #1*		2.0	Tail gas/Natural gas, 0.0005%	2018	2018	5

*New in this license.

Boiler #1 and Flare #1 have been removed from the facility and are hereby removed from this air emission license.

C. Application Classification

All rules, regulations, or statutes referenced in this air emission license refer to the amended version in effect as of the issued date of this license.

The modification of a minor source is considered a major or minor modification based on whether or not expected emission increases exceed the “Significant Emission” levels as defined in the Department’s *Definitions Regulation*, 06-096 Code of Maine Rules (C.M.R.) ch. 100. The emission increases are determined by subtracting the current licensed annual emissions preceding the modification from the maximum future licensed annual emissions, as follows:

<u>Pollutant</u>	<u>Current License (TPY)</u>	<u>Future License (TPY)</u>	<u>Net Change (TPY)</u>	<u>Significant Emission Levels</u>
PM	2.2	3.0	+0.8	100
PM ₁₀	2.2	3.0	+0.8	100
SO ₂	10.2	2.5	-7.7	100
NO _x	19.3	32.4	+13.1	100
CO	31.6	67.8	+36.2	100
VOC	10.0	21.5	+11.5	50
CO ₂ e	<100,000	<100,000	---	100,000

This modification is determined to be a minor modification and has been processed as such.

D. Facility Classification

With the annual operating hours restriction on Flare #2 and EGEN #1, the facility is licensed as follows:

- As a synthetic minor source of air emissions, because the licensed emissions are below the major source thresholds for criteria pollutants; and
- As an area source of hazardous air pollutants (HAP), because the licensed emissions are below the major source thresholds for HAP.

II. **BEST PRACTICAL TREATMENT (BPT)**

A. Introduction

In order to receive a license, the applicant must control emissions from each unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in *Definitions Regulation*, 06-096 C.M.R. ch. 100. Separate control requirement categories exist for new and existing equipment.

BPT for new sources and modifications requires a demonstration that emissions are receiving Best Available Control Technology (BACT), as defined in *Definitions Regulation*, 06-096 C.M.R. ch. 100. BACT is a top-down approach to selecting air emission controls considering economic, environmental and energy impacts.

B. Project Description

Village Green currently processes a slurry of pumpable organic wastewater treatment wastes from residential, municipal, and commercial sources to yield a stabilized digestate, which is further processed into a residual for agronomic use and a biogas consumed in an onsite combined heat and power (CHP) unit to produce electricity and heat, some of which is used for plant operations. The CHP as currently licensed can fire both biogas and pipeline natural gas.

As part of this project, Village Green is seeking to modify facility operations by making the following changes:

- Adding a second anaerobic digester tank;
- Changing the process to clean biogas produced by the digesters to pipeline quality standards for sale to the natural gas pipeline as renewable natural gas;
- Removing the existing 1.2 MMBtu/hr natural gas-fired boiler;
- Adding a thermal oxidizer for control of tail gas resulting from the production of renewable natural gas;
- Replacing the existing emergency/excess biogas flare (Flare #1) with a larger capacity flare (Flare #2) designed to handle the increase in biogas production from the installation of an additional digester tank;
- Converting the existing biogas/pipeline natural gas fueled CHP unit, CHP #1, to strictly being fired by pipeline natural gas;
- Adding a new, 1.2 MW natural gas-fired CHP unit, CHP #2, to produce additional electricity and facility heat; and
- Adding a new, natural gas-fired emergency generator for backup power.

For the remainder of this air emission license ‘natural gas’ means pipeline natural gas and ‘biogas’ means gas produced by the Anaerobic Digester System, unless otherwise noted.

New Digester Tank

Village Green proposes to install a new 2.1-million-gallon fixed roof, central axis mixer digester tank to replace the current 850,000-gallon anaerobic digester tank as the primary tank in the two-step anaerobic digestion process. Once the new tank is installed, the current, smaller tank will transition to providing secondary polishing and gas collection to support the new, larger digester. The new tank setup will allow the system to operate thermophilically, which means that the system will operate in a higher temperature range than the current, smaller system can. Operating the system at higher temperatures will

both help to reduce pathogens and lead to an increased reaction rate, which will in turn aid in control of odor and lead to an increase in biogas production. Gas storage in the updated system will continue to be accomplished using the flexible, double-membrane gas dome on the existing, 850,000-gallon anaerobic digester tank. Raw biogas production from the updated system is expected to increase from 300 scfm to somewhere between 650 and 700 scfm.

Hydrogen Sulfide (H₂S) Treatment System, Thermal Oxidizer, and Flare

As currently designed, Village Green uses raw biogas produced by the digester to power CHP #1, with any excess biogas produced going to a flare. As part of this project, Village Green proposes to install a new gas treatment system to process and clean up the raw biogas produced by the digester such that it meets renewable natural gas standards so that it can be sold to the natural gas pipeline. Village Green plans to accomplish this by first passing the raw biogas through a desulfurization reactor to remove hydrogen sulfide (H₂S) from the gas stream, and then using hollow fiber membrane chamber technology to finish cleaning the gas. In order to control the waste, or “tail”, gas from the conditioning process, Village Green proposes to install a thermal oxidizer. Because the tail gas will have a reduced methane content and a low heat content, pipeline natural gas will be used to supplement the tail gas for proper control and combustion in the thermal oxidizer. The thermal oxidizer will be in use at all times biogas is being cleaned and conditioned for injection into the natural gas pipeline.

In addition to the installation of a new H₂S treatment system and thermal oxidizer, Village Green proposes to replace the current 15 MMBtu/hr flare with a larger, 39.8 MMBtu/hr flare. This new flare will act as a backup to control generated biogas in the event of gas processing and conditioning equipment downtime and periods when biogas production is in excess of what the gas processing and conditioning equipment can handle. The new flare is designed to burn 150% of the expected biogas volume following the facility upgrades.

Combined Heat and Power (CHP) Units and Emergency Generator

As currently designed, CHP #1 uses biogas produced by AD #1 and minimal amounts of natural gas, as necessary, to produce electricity and heat. As part of this amendment, Village Green proposes to remove biogas as a licensed fuel for CHP #1 and convert the unit to firing only natural gas. Village Green also proposes to install a second CHP unit, CHP #2, which will be designed to produce 1.2 MW of electricity and to fire only natural gas. The electricity and heat produced by these units will mostly be used onsite, with excess electricity sold to the electric grid.

Village Green has also proposed to install a natural gas-fired emergency generator, EGEN #1, at the facility. Village Green intends to use this unit as a backup power source for power outage situations in order to maintain dome inflation on the gas collection system and provide backup power for other critical operations. The unit will only be operated during emergency situations and for maintenance and exercising.

C. CHP #1

1. Removal of Biogas as a Licensed Fuel

As part of this amendment, Village Green has proposed to convert CHP #1, which is currently licensed to fire biogas and natural gas, to strictly natural gas fuel use. This change will not occur until after the facility begins sending natural gas from the gas treatment system to the natural gas pipeline; therefore, CHP #1 shall remain licensed to fire biogas until the facility begins to deliver natural gas to the natural gas pipeline, and the biogas emission limits shall remain in the license until that time.

2. Visible Emissions Limit

In A-1086-71-A-N (January 13, 2014), the visible emissions limit for CHP #1 was determined to be the following:

Visible emissions from the stack for CHP #1 shall not exceed 10% opacity on a six-minute block average basis, except for no more than two six-minute block averages in a continuous three-hour period.

The Department is using this amendment as an opportunity to update the CHP #1 visible emissions limit to the following under the authority of *Major and Minor Source Air Emission License Regulations*, 06-096 C.M.R. ch. 115, BPT:

Visible emissions from the stack for CHP #1 shall not exceed 10% opacity on a six-minute block average basis. During periods of startup, Village Green may elect to comply with the work practice standards below in lieu of this visible emission standard:

- Village Green shall maintain a log (written or electronic) of the date, time, and duration of all startups of CHP #1;
- CHP #1 shall be operated in accordance with the manufacturer's emission-related operating instructions;
- Village Green shall minimize the engine's time spent at idle and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply; and

- CHP #1, including any associated air pollution control equipment, shall be operated at all times in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Department that may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the unit.

This change will provide the facility with more flexibility during times of unit startup and is in line with the proposed changes to the rule *Visible Emissions Regulation*, 06-096 C.M.R. ch. 101.

D. CHP #2

Village Green plans to operate CHP #2, a combined heat and power unit, as both an electrical generator and a source of facility heat and/or steam. CHP #2 has an engine rated at 9.92 MMBtu/hr and is capable of producing up to 1.2 MW (1,200 kW) of electricity. CHP #2 fires natural gas at a maximum rate of 162 scfm. CHP #2 will likely be manufactured in 2018 and installed at the facility in late 2018.

1. BACT Findings

a. Particulate Matter (PM and PM₁₀)

PM and PM₁₀ emissions from fuel combustion are formed from incomplete combustion of fuel and non-combustible material in the fuel. Emissions of PM and PM₁₀ from combustion of natural gas in engines that are properly operated and maintained are inherently low due to the low ash content of natural gas. Additionally, CHP #2 will be equipped with standard fuel and air filters which remove particulates and improve engine performance and reliability. Additional PM control technologies, including fabric filters, electrostatic precipitators, wet scrubbers, and cyclones, are not generally used for engines and are considered economically infeasible due to the high cost of installing additional PM control and the minimal emissions reduction that would be achieved by such additional control.

The Department finds proper operation and maintenance of the unit, the firing of natural gas, use of standard fuel and air filters, and emission limits of 0.05 lb/MMBtu for PM and 0.50 lb/hr for both PM and PM₁₀ to constitute BACT for PM and PM₁₀ emissions from CHP #2.

b. Sulfur Dioxide (SO₂)

Sulfur dioxide is formed from the combustion of sulfur present in the fuel. Control options identified for SO₂ emissions include the use of fuel with a low sulfur content such as natural gas, sorbent injection, and SO₂ scrubbing technologies such as flue gas desulfurization and packed-bed scrubbers. Given the negligible sulfur content of natural gas and the relatively small size (9.92 MMBtu/hr) of the unit, additional controls to further reduce emissions of SO₂ would not be economically feasible. The Department finds proper operation and maintenance of the unit, the firing of natural gas, and an emission limit of 0.01 lb/hr to constitute BACT for SO₂ emissions from CHP #2.

c. Nitrogen Oxides (NO_x)

Nitrogen oxides mainly consist of nitric oxide (NO) and nitrogen dioxide (NO₂). Emissions of NO_x from CHP #2 are attributable to the combustion of natural gas in the unit. NO_x from the combustion process are generated through one of three mechanisms: fuel NO_x, thermal NO_x, and prompt NO_x. Fuel NO_x is produced by the oxidation of nitrogen in the fuel. Thermal NO_x is formed in the high temperature area of the engine and increases exponentially with increases in flame temperature and linearly with increases in residence time. Flame temperature is dependent upon the ratio of fuel burned in a flame to the amount of fuel needed to consume all the available oxygen, also known as the equivalence ratio. The lower this ratio is, the lower the flame temperature; thus, by maintaining a low fuel ratio (lean combustion), the potential for thermal NO_x formation can be reduced. Prompt NO_x is formed from the oxidation of hydrocarbon radicals near the combustion flame; this produces an insignificant amount of NO_x.

Control of NO_x emissions can be accomplished through one of three methods: the use of add-on controls, such as selective catalytic reduction (SCR) and selective non-catalytic reduction (SNCR); the use of combustion control techniques, such as ignition timing retard (ITR) and derating; and the combustion of clean fuel, such as natural gas.

Add-on pollution control technology for the reduction of NO_x includes SCR, where NO_x is reduced with the aid of a catalyst into diatomic nitrogen and water using a reductant, and SNCR, where either ammonia or urea is injected into the gas stream to react with the NO_x produced by the combustion to create diatomic nitrogen and water. SCR and SNCR are primarily used on large industrial and utility boilers and gas-fired turbines. SCR is considered financially infeasible due to the high cost of installing SCR on an engine of this size (9.92 MMBtu/hr). SNCR is considered technically infeasible due to the high temperatures (1600°F to 2100°F) required to maintain a high control efficiency, which are much higher than the expected exhaust temperature from CHP #2 (775°F to 800°F).

Combustion controls for control of NO_x emissions from natural gas fired engines include ITR, where ignition timing is delayed to minimize peak combustion temperature, thereby reducing NO_x; and derating, where the engine capacity is limited to less than full power to reduce NO_x formation by reducing cylinder pressures and temperatures. ITR is considered environmentally unjustifiable due to the potential for an increase in PM and CO emissions and economically infeasible due to the negative impact on engine performance and operational stability, which would cause a loss of income from power production. Derating is considered economically infeasible due to the loss of income due to decreased power production.

The final method for controlling NO_x emissions from combustion sources is the combustion of fuel with less fuel bound nitrogen. Village Green proposes to burn natural gas in CHP #2, which inherently has a low nitrogen content.

CHP #2 is subject to *Standards of Performance for Spark Ignition Internal Combustion Engines*, 40 C.F.R. Part 60, Subpart JJJJ as a non-certified engine, and is thus required to meet the NO_x emission limit of 1.0 g/BHP-hr contained in the regulation. The Department finds use of a lean burn engine, firing of natural gas, proper operation and maintenance of the unit, and emission limits of 1.0 g/BHP-hr and 3.69 lb/hr to constitute BACT for NO_x emissions from CHP #2.

d. Carbon Monoxide (CO) and Volatile Organic Compounds (VOC)

CO and VOC emissions from natural gas fired engines are attributable to the incomplete combustion of organic compounds in the fuel, which is a function of oxygen availability, flame temperature, residence time, combustion zone design, and turbulence. Potential technologies for the control of CO and VOC emissions from CHP #2 include add-on controls, such as oxidation catalysts, and combustion control techniques, such as good combustion practices.

Add-on pollution control technology for the reduction of CO and VOC from combustion sources primarily includes oxidation catalysts, where CO and VOC are oxidized with the aid of a catalyst into carbon dioxide. Oxidation catalysts are commonly used on natural-gas fired internal combustion sources such as stationary engines, and Village Green has proposed use of one on CHP #2.

CHP #2 is subject to 40 C.F.R. Part 60, Subpart JJJJ as a non-certified engine, and is thus required to meet the CO emission limit of 2.0 g/BHP-hr and VOC emission limit of 0.7 g/BHP-hr contained in the regulation. The Department finds the use of good combustion practices, use of an oxidation catalyst, and emission limits of 2.0 g/BHP-hr and 7.39 lb/hr for CO and 0.7 g/BHP-hr and 2.59 lb/hr for VOC to constitute BACT for emissions of CO and VOC from CHP #2.

e. Visible Emissions

Visible emissions from CHP #2 shall not exceed 10% opacity on a six-minute block average basis. During periods of startup, Village Green may elect to comply with the work practice standards below in lieu of this visible emission standard:

- Village Green shall maintain a log (written or electronic) of the date, time, and duration of all startups of CHP #2;
- CHP #2 shall be operated in accordance with the manufacturer's emission-related operating instructions;
- Village Green shall minimize the engine's time spent at idle and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply; and
- CHP #2, including any associated air pollution control equipment, shall be operated at all times in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Department that may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the unit.

f. Recordkeeping

Village Green shall keep records of the hours of operation of CHP #2 on a monthly and 12-month rolling total basis. Village Green shall also keep records of all inspections and maintenance conducted on CHP #2.

2. Emission Limits

The BACT emission limits for CHP #2 are based on the following:

PM/PM ₁₀	- 0.05 lb/MMBtu based on 06-096 C.M.R. ch. 115, BACT
SO ₂	- 0.000588 lb/MMBtu based on AP-42, Table 3.2-2, dated 7/00
NO _x	- 1.0 g/bhp-hr based on 40 C.F.R. Part 60, Subpart JJJJ, Table 1
CO	- 2.0 g/bhp-hr based on 40 C.F.R. Part 60, Subpart JJJJ, Table 1
VOC	- 0.7 g/bhp-hr based on 40 C.F.R. Part 60, Subpart JJJJ, Table 1
Opacity	- 06-096 C.M.R. ch. 115, BACT

The BACT emission limits for CHP #2 are the following:

<u>Unit</u>	<u>Pollutant</u>	<u>lb/MMBtu</u>
CHP #2	PM	0.05

<u>Unit</u>	<u>PM (lb/hr)</u>	<u>PM₁₀ (lb/hr)</u>	<u>SO₂ (lb/hr)</u>	<u>NO_x (lb/hr)</u>	<u>CO (lb/hr)</u>	<u>VOC (lb/hr)</u>
CHP #2	0.50	0.50	0.01	3.69	7.39	2.59

Visible emissions from CHP #2 shall not exceed 10% opacity on a six-minute block average basis. During periods of startup, Village Green may elect to comply with the work practice standards below in lieu of this visible emission standard:

- Village Green shall maintain a log (written or electronic) of the date, time, and duration of all startups of CHP #2;
- CHP #2 shall be operated in accordance with the manufacturer's emission-related operating instructions;
- Village Green shall minimize the engine's time spent at idle and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply; and
- CHP #2, including any associated air pollution control equipment, shall be operated at all times in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Department that may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the unit.

3. 40 C.F.R. Part 60, Subpart JJJJ

Standards of Performance for Spark Ignition Internal Combustion Engines, 40 C.F.R. Part 60, Subpart JJJJ is applicable to CHP #2 since the unit was ordered after June 12, 2006, and manufactured after January 1, 2009. [40 C.F.R. § 60.4230] CHP #2 is considered a four-stroke lean-burn natural gas fired engine with a maximum engine power of more than 500 HP. [40 C.F.R. § 60.4230(a)(4)(i)] By meeting the requirements of 40 C.F.R. Part 60, Subpart JJJJ, the unit also meets the requirements found in the *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*, 40 C.F.R. Part 63, Subpart ZZZZ. [40 C.F.R. § 63.6590(c)]

A summary of the currently applicable federal 40 C.F.R. Part 60, Subpart JJJJ requirements is listed below:

a. Emission Standards

CHP #2 shall meet one of the sets of emission standards below, for non-emergency natural gas-fired engines with maximum engine power greater than 1,350 HP. These emission standards shall be met for the life of the engine.

(1) Grams per Horsepower-Hour (g/HP-hr)

- (i) 1.0 g/HP-hr for NO_x
- (ii) 2.0 g/HP-hr for CO
- (iii) 0.7 g/HP-hr for VOC

(2) Parts per Million by Volume, Dry Basis, at 15% oxygen (ppmvd)

- (i) 82 ppmvd for NO_x
- (ii) 270 ppmvd for CO
- (iii) 60 ppmvd for VOC

[40 C.F.R. §§ 60.4233(e) and 60.4234 & 40 C.F.R. Part 60, Subpart JJJJ, Table 1]

b. Emission Standards Compliance Requirements

Village Green shall comply with the emission standards in Table 1 of 40 C.F.R. Part 60, Subpart JJJJ using one of the following options [40 C.F.R. § 60.4243(a) and (b)]:

- (1) Village Green shall purchase and install an engine certified according to the procedures specified in 40 C.F.R. Part 60, Subpart JJJJ, for the same model year and shall demonstrate continuous compliance by operating and maintaining CHP #2 and any associated control device(s) according to the manufacturer's emission-related written instructions and keeping records of conducted maintenance on the unit. The unit shall also meet the requirements as specified in 40 C.F.R. Part 1068, Subparts A through D, as they apply to CHP #2. If Village Green adjusts engine settings according to and consistent with the manufacturer's instructions, CHP #2 will not be considered out of compliance; or

(2) Village Green shall purchase a non-certified engine subject to the emission standards specified in 40 C.F.R. § 60.4233(e), and shall demonstrate compliance with the emission standards according to the following requirements:

- (i) Keep a maintenance plan and records of conducted maintenance;
- (ii) To the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions; and
- (iii) Conduct an initial performance test within 60 days after achieving the maximum engine output, but not later than 180 days after initial startup of the unit, and conduct subsequent performance testing every 8,760 hours of engine operation or three years, whichever comes first. Each performance test shall be completed according to the procedures in 40 C.F.R. § 60.4244.

c. Testing Requirements

Should Village Green elect to install a non-certified engine, CHP #2 shall be subject to the following requirements:

(1) Testing Procedures

Village Green shall conduct each performance test for CHP #2 according to the requirements in 40 C.F.R. Part 60, Subpart JJJJ, Table 2, and the following procedures [40 C.F.R. § 60.4244(a) through (c) & 40 C.F.R. Part 60, Subpart JJJJ, Table 2]:

- (i) Each performance test shall be conducted within ten percent of the 100 percent peak (or the highest achievable) load and according to the requirements in 40 C.F.R. § 60.8 and under the specific conditions that are specified by Table 2 of 40 C.F.R. Part 60, Subpart JJJJ;
- (ii) Performance tests shall not be conducted during periods of startup, shutdown, or malfunction, as specified in 40 C.F.R. § 60.8(c). If CHP #2 is non-operational, Village Green does not need to startup the engine solely to conduct a performance test; however, the performance test must be conducted immediately upon startup of the engine; and
- (iii) Village Green shall conduct three separate test runs for each required performance test, as specified in 40 C.F.R. § 60.8(f). Each test run shall be conducted within ten percent of 100 percent peak (or the highest achievable) load and last at least one hour.

(2) Test Result Conversion

To determine compliance with the mass per unit output emission limitations, concentrations of NO_x, CO, and VOC shall be converted to mass per unit output according to the equations found in 40 C.F.R. § 60.4244(d) through (f). [40 C.F.R. § 60.4244(d) through (f)]

d. Recordkeeping Requirements

Village Green shall keep the following records for CHP #2 [40 C.F.R. § 60.4245(a)]:

- (1) All notifications submitted to comply with 40 C.F.R. Part 60, Subpart JJJJ and all documentation supporting any notification;
- (2) Maintenance conducted on the engine; and
- (3) Documentation that the engine meets the 40 C.F.R. Part 60, Subpart JJJJ emission standards.

e. Notification and Reporting Requirements

Should Village Green elect to install a non-certified engine, the facility shall be subject to the following notification and reporting requirements:

(1) Initial Notification

Village Green shall submit an initial notification to EPA as required in 40 C.F.R. § 60.7(a)(1). This notification shall include the following information [40 C.F.R. § 60.4245(c)]:

- (i) Name and address of the owner or operator;
- (ii) The address of the affected source;
- (iii) Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;
- (iv) Emission control equipment; and
- (v) Fuel used.

(2) Performance Test Results

Village Green shall submit a copy of each performance test as conducted in 40 C.F.R. § 60.4244 within 60 days after the test has been completed. Performance test reports using EPA Method 18, EPA Method 320, or ASTM D6348-03 (incorporated by reference—see 40 C.F.R. § 60.17) to measure VOC require reporting of all QA/QC data. For Method 18, report results from sections 8.4 and 11.1.1.4; for Method 320, report results from

sections 8.6.2, 9.0, and 13.0; and for ASTM D6348-03 report results of all QA/QC procedures in Annexes 1-7. [40 C.F.R. § 60.4245(d)]

E. EGEN #1

Village Green plans to operate EGEN #1 as an emergency generator. EGEN #1 is a generator set consisting of an engine and an electrical generator. EGEN #1 has an engine rated at 1.55 MMBtu/hr (150 kW) that fires natural gas at a maximum rate of 1,515 scf/hr. EGEN #1 will likely be manufactured in 2018 and installed at the facility in late 2018.

1. BACT Findings

a. Particulate Matter (PM and PM₁₀)

PM emissions from natural gas-fired engines are generally controlled through proper operation and maintenance. Additionally, this engine will be subject to 40 C.F.R. Part 60, Subpart JJJJ, which means it will be required to meet EPA emission standards for emergency stationary engines as discussed below. Given the operating hours restriction included in 40 C.F.R. Part 60, Subpart JJJJ for emergency engines, the use of add-on controls for PM is not economically feasible. The Department finds proper operation and maintenance of the unit and an emission limit of 0.08 lb/hr to constitute BACT for PM and PM₁₀ emissions from EGEN #1.

b. Sulfur Dioxide (SO₂)

For emergency engines that fire natural gas, which inherently has a low fuel sulfur content, and operate for only short periods of time, the use of wet scrubbers or other additional SO₂ add-on control methods would not be economically feasible considering the minimal emissions due to the limited use of the engines. The most practical method for limiting SO₂ emissions of such an engine is the use of a low sulfur fuel, such as natural gas. The Department finds use of natural gas and an emission limit of 0.01 lb/hr to constitute BACT for SO₂ emissions from EGEN #1.

c. Nitrogen Oxides (NO_x)

Potentially available control options for reducing emissions of NO_x from natural gas-fired generators include combustion controls, selective catalytic reduction (SCR), and non-selective catalytic reduction (NSCR). Combustion controls are typically implemented through design features such as electronic engine controls, injection systems, combustion chamber geometry, and turbocharging systems. Most new engines are designed with these features as standard equipment.

SCR and NSCR are both post-combustion NO_x reduction technologies. SCR uses ammonia to react with NO_x in the gas stream in the presence of a catalyst to form nitrogen and water. NSCR uses a catalyst to convert CO, NO_x, and hydrocarbons into carbon dioxide, nitrogen, and water without the use of an additional reagent, and requires strict air-to-fuel control to maintain high reduction effectiveness without increasing hydrocarbon emissions. For a unit of this usage (emergency back-up engine), neither SCR nor NSCR would be economically feasible considering the minimal emissions due to the limited use of the engine.

The Department finds use of good combustion controls, proper operation and maintenance of the engine, and an emission limit of 6.32 lb/hr to constitute BACT for NO_x emissions from EGEN #1.

d. Carbon Monoxide (CO) and Volatile Organic Compounds (VOC)

CO and VOC emissions from emergency engines are a result of incomplete combustion, caused by conditions such as insufficient residence time or limited oxygen availability. CO and VOC emissions from natural gas-fired emergency engines are generally controlled through proper operation and maintenance. Oxidation catalysts have been used on large engines to reduce CO and VOC emissions levels in the exhaust, but, like SCR and NSCR, use of an oxidation catalyst on an emergency engine with limited yearly use would not provide a significant environmental benefit and would not be economically feasible. The Department finds proper operation and maintenance of the engine and emissions limits of 0.86 lb/hr for CO and 0.18 lb/hr for VOC to constitute BACT for CO and VOC emissions from EGEN #1.

e. Visible Emissions

Visible emissions from EGEN #1 shall not exceed 10% opacity on a six-minute block average basis.

2. Emission Limits

The BACT emission limits for EGEN #1 are based on the following:

PM/PM ₁₀	- 0.05 lb/MMBtu from 06-096 C.M.R. ch. 115, BACT
SO ₂	- 0.000588 lb/MMBtu from AP-42, Table 3.2-2, dated 7/00
NO _x	- 4.08 lb/MMBtu from AP-42, Table 3.2-2, dated 7/00
CO	- 0.557 lb/MMBtu from AP-42, Table 3.2-2, dated 7/00
VOC	- 0.118 lb/MMBtu from AP-42, Table 3.2-2, dated 7/00
Opacity	- 06-096 C.M.R. ch. 115, BACT

The BACT emission limits for EGEN #1 are the following:

Unit	PM (lb/hr)	PM₁₀ (lb/hr)	SO₂ (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
EGEN #1	0.08	0.08	0.01	6.32	0.86	0.18

Visible emissions EGEN #1 shall not exceed 10% opacity on a six-minute block average basis.

3. 40 C.F.R. Part 60, Subpart JJJJ

Standards of Performance for Spark Ignition Internal Combustion Engines, 40 C.F.R. Part 60, Subpart JJJJ is applicable to EGEN #1 since the unit was ordered after June 12, 2006, and manufactured after January 1, 2009. [40 C.F.R. § 60.4230(a)(4)(iv)] By meeting the requirements of 40 C.F.R. Part 60, Subpart JJJJ, the unit also meets the requirements found in the *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*, 40 C.F.R. Part 63, Subpart ZZZZ. [40 C.F.R. § 63.6590(c)]

A summary of the currently applicable federal 40 C.F.R. Part 60, Subpart JJJJ requirements is listed below.

a. Emergency Engine Designation and Operating Criteria

Under 40 C.F.R. Part 60, Subpart JJJJ, a stationary reciprocating internal combustion engine (ICE) is considered an emergency stationary ICE (emergency engine) as long as the engine is operated in accordance with the following criteria. Operation of an engine outside of the criteria specified below may cause the engine to no longer be considered an emergency engine under 40 C.F.R. Part 60, Subpart JJJJ, resulting in the engine being subject to requirements applicable to non-emergency engines.

(1) Emergency Situation Operation (On-Site)

There is no operating time limit on the use of an emergency engine to provide electrical power or mechanical work during an emergency situation. Examples of use of an emergency engine during emergency situations include the following:

- Use of an engine to produce power for critical networks or equipment (including power supplied to portions of a facility) because of failure or interruption of electric power from the local utility (or the normal power source, if the facility runs on its own power production);
- Use of an engine to mitigate an on-site disaster or equipment failure;

- Use of an engine to pump water in the case of fire, flood, natural disaster, or severe weather conditions; and
- Similar instances.

(2) Non-Emergency Situation Operation

An emergency engine may be operated up to a maximum of 100 hours per calendar year for maintenance checks, readiness testing, and other non-emergency situations as described below.

- (i) An emergency engine may be operated for a maximum of 100 hours per calendar year for maintenance checks and readiness testing, provided that the tests are recommended by federal, state, or local government; the manufacturer; the vendor; the regional transmission organization or equivalent balancing authority and transmission operator; or the insurance company associated with the engine. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency ICE more than 100 hours per calendar year.
- (ii) An emergency engine may be operated for up to 50 hours per calendar year for other non-emergency situations. **However, these operating hours are counted as part of the 100 hours per calendar year operating limit described in paragraph (2) and (2) (i) above.**

The 50 hours per calendar year operating limit for other non-emergency situations cannot be used for peak shaving, demand response, or to generate income for a facility by providing power to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

[40 C.F.R. §§ 60.4243(d) and 60.4248]

b. 40 C.F.R. Part 60, Subpart JJJJ Requirements

(1) Emission Standards

EGEN #1 shall meet one of the sets of emission standards below, for emergency natural gas-fired engines with maximum engine power greater than 130 HP manufactured after January 1, 2009. These emission standards shall be met for the life of the engine.

- (i) Grams per Horsepower-Hour (g/HP-hr)
 - 1. 2.0 g/HP-hr for NO_x
 - 2. 4.0 g/HP-hr for CO
 - 3. 1.0 g/HP-hr for VOC

- (ii) Parts per Million by Volume, Dry Basis, at 15% Oxygen (ppmvd at 15% O₂)
 - 1. 160 ppmvd for NO_x
 - 2. 540 ppmvd for CO
 - 3. 86 ppmvd for VOC

[40 C.F.R. §§ 60.4233(e) and 60.4234 & 40 C.F.R. Part 60, Subpart JJJJ, Table 1]

(2) Emission Standards Compliance Requirements

Village Green shall comply with the emission standards in Table 1 of 40 C.F.R. Part 60, Subpart JJJJ using one of the following options [40 C.F.R. § 60.4243(a) and (b)]:

- (i) Village Green shall purchase and install an engine certified according to the procedures specified in 40 C.F.R. Part 60, Subpart JJJJ, for the same model year and shall demonstrate continuous compliance by operating and maintaining EGEN #1 and any associated control device(s) according to the manufacturer's emission-related written instructions or procedures developed by Village Green that are approved by the manufacturer, and keeping records of conducted maintenance on the unit. The unit shall also meet the requirements as specified in 40 C.F.R. Part 1068, Subparts A through D, as they apply to EGEN #1. If Village Green adjusts engine settings according to and consistent with the manufacturer's instructions, EGEN #1 will not be considered out of compliance; or

- (ii) Village Green shall purchase a non-certified engine subject to the emission standards specified in 40 C.F.R. § 60.4233(e), and shall demonstrate compliance with the emission standards according to the following requirements:
 - 1. Keep a maintenance plan and records of conducted maintenance;
 - 2. To the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions; and
 - 3. Conduct an initial performance test within 60 days after achieving the maximum engine output, but not later than 180 days after initial startup of the unit according to the procedures in 40 C.F.R. § 60.4244.

(3) Non-Resettable Hour Meter

A non-resettable hour meter shall be installed and operated on EGEN #1. [40 C.F.R. § 60.4237(b) and 06-096 C.M.R. ch. 115, BPT]

(4) Annual Time Limit for Maintenance and Testing

- (i) As an emergency engine, EGEN #1 shall be limited to 100 hours/year for maintenance checks and readiness testing. Up to 50 hours/year of the 100 hours/year may be used in non-emergency situations (this does not include peak shaving, demand response, or to generate income for a facility by providing power to an electric grid or otherwise supply power as part of a financial arrangement with another entity). The limits are based on a calendar year. Compliance shall be demonstrated by records (electronic or written log) of all engine operating hours. [40 C.F.R. § 60.4243(d) and 06-096 C.M.R. ch. 115, BPT]
- (ii) Village Green shall keep records that include maintenance conducted on EGEN #1 and the hours of operation of the engine recorded through the non-resettable hour meter. Documentation shall include the number of hours the unit operated for emergency purposes, the number of hours the unit operated for non-emergency purposes, and the reason the engine was in operation during each time. [40 C.F.R. § 60.4245(b)]

(5) Testing Requirements

Should Village Green elect to install a non-certified engine, EGEN #1 shall be subject to the following requirements:

(i) Testing Procedures

Village Green shall conduct the performance test for EGEN #1 according to the requirements in 40 C.F.R. Part 60, Subpart JJJJ, Table 2, and the following procedures [40 C.F.R. § 60.4244(a) through (c) & 40 C.F.R. Part 60, Subpart JJJJ, Table 2]:

1. Each performance test shall be conducted within ten percent of the 100 percent peak (or the highest achievable) load and according to the requirements in 40 C.F.R. § 60.8 and under the specific conditions that are specified by Table 2 of 40 C.F.R. Part 60, Subpart JJJJ;

2. Performance tests shall not be conducted during periods of startup, shutdown, or malfunction, as specified in 40 C.F.R. § 60.8(c). If EGEN #1 is non-operational, Village Green does not need to start up the engine solely to conduct a performance test; however, the performance test must be conducted immediately upon startup of the engine; and
3. Village Green shall conduct three separate test runs for each required performance test, as specified in 40 C.F.R. § 60.8(f). Each test run shall be conducted within ten percent of 100 percent peak (or the highest achievable) load and last at least one hour.

(ii) Test Result Conversion

To determine compliance with the mass per unit output emission limitations, concentrations of NO_x, CO, and VOC shall be converted to mass per unit output according to the equations found in 40 C.F.R. § 60.4244(d) through (f). [40 C.F.R. § 60.4244(d) through (f)]

(6) Recordkeeping Requirements

Village Green shall keep the following records for EGEN #1 [40 C.F.R. § 60.4245(a)]:

- (i) All notifications submitted to comply with 40 C.F.R. Part 60, Subpart JJJJ and all documentation supporting any notification;
- (ii) Maintenance conducted on the engine; and
- (iii) Documentation that the engine meets the 40 C.F.R. Part 60, Subpart JJJJ emission standards.

(7) Notification and Reporting Requirements

Should Village Green elect to install a non-certified engine, Village Green shall submit a copy of the performance test as conducted in 40 C.F.R. § 60.4244 within 60 days after the test has been completed. Performance test reports using EPA Method 18, EPA Method 320, or ASTM D6348-03 (incorporated by reference—see 40 C.F.R. § 60.17) to measure VOC require reporting of all QA/QC data. For Method 18, report results from sections 8.4 and 11.1.1.4; for Method 320, report results from sections 8.6.2, 9.0, and 13.0; and for ASTM D6348-03 report results of all QA/QC procedures in Annexes 1-7. [40 C.F.R. § 60.4245(d)]

F. Anaerobic Digester System

As part of this amendment, Village Green proposes to upgrade the Anaerobic Digester System by installing a new 2.1 million-gallon fixed roof digester tank and by installing an upgraded hydrogen sulfide (H₂S)/gas treatment system. Village Green proposes to control emissions from the Anaerobic Digester System using a combination of a thermal oxidizer, TOX #1, and a flare, Flare #2, instead of using CHP #1 and a smaller flare, Flare #1, that has been removed from the facility's air emission license.

As proposed, the new digester tank will operate as the primary reactor, which will allow the existing 850,000-gallon digester tank to be used solely for secondary polishing and gas collection via the double membrane "gas dome" roof system installed on the tank. This change will increase the capacity of the Anaerobic Digester System, including the two large digester tanks (AD #1 and AD #2) and the digestate storage tank, to 3.26 million-gallons and is projected to increase biogas generation to between 650 and 700 standard cubic feet per minute (SCFM).

The proposed upgrades to the H₂S/gas treatment system include the use of a desulfurization reactor to remove H₂S from the gas stream and the installation of a hollow fiber membrane chamber (HFMC) module that will be used to remove carbon dioxide (CO₂) and other contaminants in order to create pipeline quality natural gas that meets renewable natural gas standards. Village Green proposes to treat the waste, or 'tail' gas created by the biogas cleaning and conditioning process using a thermal oxidizer, TOX #1. The low BTU tail gas in the thermal oxidizer will be supplemented with natural gas for proper control and combustion.

Any biogas in excess of what the gas cleaning and conditioning equipment can handle will be sent to a new flare, Flare #2, for treatment, as will biogas produced during gas processing and conditioning equipment downtime. This is expected to happen less than 500 hours/year. Flare #2 will be conservatively designed to burn up to 150% of the expected biogas volume following the proposed upgrades, which is roughly 1,050 SCFM of biogas. These changes will allow Village Green to send cleaned and conditioned biogas directly into the natural gas pipeline instead of burning it on site as is currently done.

1. BACT Findings – Anaerobic Digester System

The primary regulated pollutant from the tail gas generated by the gas processing and conditioning portion of the Anaerobic Digester System is volatile organic compounds (VOC); therefore, the following BACT analysis will only address control of VOC emissions from the Anaerobic Digester System.

a. Volatile Organic Compounds (VOC)

VOCs are hydrocarbons which participate in atmospheric photochemical reactions and are produced as byproducts of the anaerobic digestion and gas cleaning and conditioning processes. Potential control techniques for control of VOC emissions from the Anaerobic Digester System include catalytic oxidation, carbon adsorption, wet scrubbers (absorbers), flares, and thermal oxidizers.

In catalytic oxidation, gas passes through a passive radiator consisting of a series of narrow honeycomb passages coated with a precious metal, such as palladium. Under favorable temperature conditions (360° F - 390° F) the precious metal coated passages aid in oxidizing VOC present in the gas into non-volatile compounds. Catalytic oxidation is traditionally used to control VOC from combustion sources such as boilers and engines due to the elevated temperature required for the catalyst to operate efficiently. Given the temperature requirements of the gas entering the catalyst, additional equipment to heat the tail gas prior to passing through the catalyst would need to be installed. This fact, in addition to the costs of replacing the catalyst and the moderately high potential for the catalyst to be poisoned by compounds that may be present in the tail gas make catalytic oxidation economically and technologically infeasible for control of VOC emissions from the Anaerobic Digester System.

In carbon adsorption, effluent gas passes through a filter media filled with activated carbon. As the gas passes through the media VOCs are adsorbed by the activated carbon and clean gas is vented to the atmosphere. Carbon adsorption systems are usually set up in parallel such that while one adsorber is online processing VOC, the other is offline so it can be vacuum regenerated. After the hydrocarbon vapors have been desorbed from the carbon during the regeneration stage, they are pumped to an absorber tower where they are condensed and absorbed by a scrubbing liquid. Carbon adsorption is traditionally used in instances where the VOC vapor being adsorbed can be condensed and absorbed by a scrubbing liquid that is put back into use at the facility, such as at gasoline storage and loading facilities. At Village Green, condensation, absorption, and reuse of the VOC-laden vapor is not technically possible and would require disposal of the scrubbing liquid; therefore, carbon adsorption is considered technically and environmentally infeasible for control of VOC emissions from the Anaerobic Digester System.

Wet scrubbers reduce VOC emissions by bringing the polluted gas stream into contact with a scrubbing liquid that absorbs the VOC in the gas stream. In a wet scrubber, sufficient gas-to-liquid contact is essential for generating high removal efficiencies. Wet scrubbers designed to remove gaseous pollutants generally include packed tower and plate scrubbers. Similar to carbon adsorption, the need for disposal of the used scrubbing liquid makes the use of a wet scrubber

economically and environmentally infeasible for control of VOC emissions from the Anaerobic Digester System.

Flares reduce VOC emissions by directly combusting VOC-laden gases to yield carbon dioxide and water. Flares are generally used in situations where there is excess gas that can't be used or processed in some form. Due to the minimal heat content of the tail gas produced by the gas cleaning and conditioning process flaring is not considered technically feasible for control of VOC during normal operation. However, Village Green has proposed to use a flare for control of VOC emissions from the Anaerobic Digester System during periods when the biogas cannot be processed to renewable natural gas standards, when the processed natural gas cannot be injected into the pipeline, and/or during periods when the gas cleaning and conditioning system or compressing system are down for maintenance purposes or unplanned outages.

Thermal oxidizers work by destroying VOC at high temperature via thermal combustion; this results in the chemical oxidation of VOC to form carbon dioxide and water. Thermal oxidizers are different from flares in that instead of combusting waste gas directly, thermal oxidizers generally incorporate an external fuel source designed to burn at a high enough temperature to ignite the waste gas and fully oxidize any VOC present in the waste gas. Use of a thermal oxidizer for control of VOC emissions from the tail gas produced by the Anaerobic Digester System is considered technically feasible. Village Green has proposed the use of a thermal oxidizer firing natural gas as an external fuel source for control of VOC emissions during periods when the biogas treatment system is producing renewable natural gas suitable for distribution to the natural gas pipeline and tail gas is being generated.

The Department finds the following to constitute BACT for control of VOC emissions from the Anaerobic Digester System:

- Use of a natural gas-fired thermal oxidizer for control of VOC emissions in the tail gas during periods when biogas is being treated to a level that meets renewable natural gas standards and is being injected into the natural gas pipeline;
- Use of a flare during periods when the gas cleaning/conditioning/compressing system are down for maintenance purposes or an unplanned outage, when biogas cannot be processed to renewable natural gas standards, and/or when the processed biogas cannot be injected into the natural gas pipeline;
- Proper operation and maintenance of the thermal oxidizer, flare, and Anaerobic Digester System; and

- The following emission limits for each piece of control equipment:

Unit	Pollutant	lb/MMBtu
Flare #2	PM	0.05

Unit	PM (lb/hr)	PM ₁₀ (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Flare #2	0.7	0.7	8.4	2.7	12.3	0.1
TOX #1	0.1	0.1	0.1	0.2	0.2	0.1

b. Visible Emissions

Visible emissions from TOX #1 and Flare #2 shall each not exceed 10% opacity on a six-minute block average basis.

c. Flare Operation

For the purposes of quantifying emissions, use of the flare (Flare #2) has been conservatively estimated to be 500 hours/year. Although this is not an operating limit, Village Green shall maintain operating records showing the date and the number of hours the flare operated. If for any reason use of the flare exceeds 5,500 hours/year and CHP #1 and #2 operate near or at capacity the facility would be approaching the major source threshold for CO and shall immediately notify the Department.

2. Emission Limits

The BACT emission limits for Flare #2 are based on the following:

- PM/PM₁₀ - 17 lb/MMscf of methane based on AP-42, Table 2.4-5, dated 10/08
- SO₂ - 133 lb/MMscf biogas based on an H₂S concentration of 800 ppmv in raw biogas
- NO_x - 0.068 lb/MMBtu based on AP-42, Table 13.5-1, dated 2/18
- CO - 0.31 lb/MMBtu based on AP-42, Table 13.5-2, dated 2/18
- VOC - 1.0 lb/MMscf biogas based on AP-42, Section 2.4, and 98% destruction
- Opacity - 06-096 C.M.R. ch. 115, BACT

The BACT emission limits for TOX #1 are based on the following:

- PM/PM₁₀ - 17 lb/MMscf based on AP-42, Table 2.4-5, dated 11/98
- SO₂ - 0.8 lb/MMscf based on a sulfur concentration of 5 ppm_{dv} in tail gas
- NO_x - 0.11 lb/MMBtu based on manufacturer provided data
- CO - 0.1 lb/MMBtu based on manufacturer provided data
- VOC - 1.0 lb/MMscf based on AP-42, Section 2.4, and 98% destruction
- Opacity - 06-096 C.M.R. ch. 115, BACT

The BACT emission limits for Flare #2 and TOX #1 are the following:

Unit	Pollutant	lb/MMBtu
Flare #2	PM	0.05

Unit	PM (lb/hr)	PM ₁₀ (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Flare #2	0.7	0.7	8.4	2.7	12.3	0.1
TOX #1	0.1	0.1	0.1	0.2	0.2	0.1

Visible emissions from Flare #2 and TOX #1 shall each not exceed 10% opacity on a six-minute block average basis.

3. Operation

Village Green shall use TOX #1 for control of VOC emissions from the tail gas generated by the Anaerobic Digester System during periods when biogas is being treated to a level that meets renewable natural gas standards and is being injected into the natural gas pipeline.

Village Green shall use Flare #2 for control of VOC emissions from the Anaerobic Digester System during periods when the gas cleaning/conditioning/compressing system is down for maintenance purposes or an unplanned outage, when biogas cannot be processed to renewable natural gas standards, and/or when the processed biogas cannot be injected into the natural gas pipeline.

Village Green shall operate TOX #1, Flare #2, and the Anaerobic Digester System according to the manufacturers' emission-related instructions. Village Green shall maintain records of all maintenance conducted on TOX #1, Flare #2, and the Anaerobic Digester System.

4. Periodic Monitoring

Village Green shall maintain a log (written or electronic) recording the reason, date, time, and duration of flare operations. Village Green shall maintain records of all maintenance conducted on the Anaerobic Digester System, thermal oxidizer, and flare.

G. Removal of Hydrogen Sulfide (H₂S) Monitor Requirements

Village Green is currently required to operate a H₂S monitor, to maintain records of monitor results, and to document when the desulfurization media is replaced. This requirement originated from the fact that the biogas being generated by the Anaerobic Digester System was being used as a fuel in CHP #1 and that CHP #1 had emission limits when firing biogas that necessitated the removal of sulfur compounds from the biogas. Given the fact that Village Green has requested to remove biogas as a licensed fuel for CHP #1 and plans to send cleaned and conditioned biogas to the natural gas pipeline, there is no longer a basis for the Department to require the facility to operate a H₂S monitor; therefore, all requirements pertaining to the operation, maintenance, and recordkeeping of the H₂S monitor shall no longer be required upon startup of the gas cleaning/conditioning/compressing system and initial injection of gas into the natural gas pipeline. Village Green shall notify the Department in writing of the initial injection of treated gas into the natural gas pipeline within two weeks of the date of injection. [06-096 C.M.R. ch. 115, BPT]

H. Emissions Statement

Village Green is now subject to emissions inventory requirements contained in *Emission Statements*, 06-096 C.M.R. ch. 137. Village Green shall maintain the following records in order to comply with this rule:

1. The amount of natural gas fired in CHP #1, CHP #2, and EGEN #1 (each) on a monthly basis;
2. The amount of tail gas and natural gas fired in TOX #1 on a monthly basis;
3. The amount of biogas fired in CHP #1 and Flare #2 on a monthly basis; and
4. Hours of operation for each emission unit (including TOX #1 and Flare #2) on a monthly basis.

Beginning with reporting year 2020 and every third year thereafter, Village Green shall report to the Department emissions of hazardous air pollutants as required by 06-096 C.M.R. ch. 137, § (3)(C). The Department will use these reports to calculate and invoice for the applicable annual air quality surcharge for the subsequent three billing periods. Village Green shall pay the annual air quality surcharge, calculated by the Department based on these reported emissions of hazardous air pollutants, by the date required in Title 38 M.R.S. § 353-A(3). [38 M.R.S. § 353-A(1-A)]

I. Annual Emissions

1. Total Annual Emissions

This amendment permits Village Green to continue current operations until the treated gas is injected into the natural gas pipeline for the first time. Although potential emissions of SO₂ are higher under current facility operation than they will be under future facility operation, the license fee shall be based on the future values included in the table below upon issuance of this amendment. The tons per year emissions below were calculated based on 8,760 hours per year of operation for CHP #1, CHP #2, and TOX #1, 500 hours per year of operation for Flare #2, and 100 hours per year of operation for EGEN #1:

Total Licensed Annual Emissions for the Facility
Tons/year
 (used to calculate the annual license fee)

	PM	PM₁₀	SO₂	NO_x	CO	VOC
CHP #1	0.4	0.4	0.1	14.2	31.3	10.0
CHP #2	2.2	2.2	0.1	16.2	32.4	11.3
EGEN #1	0.1	0.1	0.1	0.3	0.1	0.1
TOX #1	0.1	0.1	0.1	1.0	0.9	0.1
Flare #2	0.2	0.2	2.1	0.7	3.1	0.1
Total TPY	3.0	3.0	2.5	32.4	67.8	21.5

Pollutant	Tons/year
Single HAP	9.9
Total HAP	24.9

2. Greenhouse Gases

Greenhouse gases are considered regulated pollutants as of January 2, 2011, through 'Tailoring' revisions made to EPA's *Approval and Promulgation of Implementation Plans*, 40 C.F.R. Part 52, Subpart A, § 52.21, *Prevention of Significant Deterioration of Air Quality* rule. Greenhouse gases, as defined in 06-096 C.M.R. ch. 100, are the aggregate group of the following gases: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. For licensing purposes, greenhouse gases (GHG) are calculated and reported as carbon dioxide equivalents (CO₂e).

The quantity of CO₂e emissions from this facility is less than 100,000 tons per year, based on the following:

- the facility's fuel use and operating hour limits;
- worst case emission factors from the following sources: U.S. EPA's AP-42, the Intergovernmental Panel on Climate Change (IPCC), and *Mandatory Greenhouse Gas Reporting*, 40 C.F.R. Part 98; and
- global warming potentials contained in 40 C.F.R. Part 98.

No additional licensing actions to address GHG emissions are required at this time.

III. AMBIENT AIR QUALITY ANALYSIS

The level of ambient air quality impact modeling required for a minor source is determined by the Department on a case-by case basis. In accordance with 06-096 C.M.R. ch. 115, an ambient air quality impact analysis is not required for a minor source if the total licensed annual emissions of any pollutant released do not exceed the following levels and there are no extenuating circumstances:

Pollutant	Tons/Year
PM ₁₀	25
SO ₂	50
NO _x	50
CO	250

The total licensed annual emissions for the facility are below the emission levels contained in the table above and there are no extenuating circumstances; therefore, an ambient air quality impact analysis is not required as part of this license.

ORDER

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards, and
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License Amendment A-1086-71-C-A subject to the conditions found in Air Emission License A-1086-71-A-N and the following Specific Conditions.

Severability. The invalidity or unenforceability of any provision of this License Amendment or part thereof shall not affect the remainder of the provision or any other provisions. This License Amendment shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

SPECIFIC CONDITIONS

The following Conditions shall replace Conditions (16), (17), and (18) of Air Emission License A-1086-71-A-N (January 13, 2014):

(16) **CHP #1 and #2**

A. Emissions shall not exceed the following:

Unit	Pollutant	lb/MMBtu	Origin and Authority
CHP #1	PM	0.05	06-096 C.M.R. ch. 115, BPT
CHP #2	PM	0.05	06-096 C.M.R. ch. 115, BACT

B. Emissions shall not exceed the following [06-096 C.M.R. ch. 115, BACT]:

Unit	PM (lb/hr)	PM₁₀ (lb/hr)	SO₂ (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
CHP #1	0.1	0.1	0.1	3.3	7.1	2.3
CHP #2	0.50	0.50	0.01	3.69	7.39	2.59

C. CHP #1 shall not exceed the following emissions when firing/operating on digester gas (biogas). The limits below shall apply until such time as Condition (23) of this air emission license amendment is fulfilled, at which point digester gas (biogas) shall no longer be a licensed fuel for CHP #1 [06-096 C.M.R. ch. 115, BACT]:

PM (lb/hr)	PM₁₀ (lb/hr)	SO₂ (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
0.5	0.5	2.3	4.3	7.1	2.3

D. Visible Emissions

Visible emissions from CHP #1 and CHP #2 shall each not exceed 10% opacity on a six-minute block average basis. During periods of startup, Village Green may elect to comply with the work practice standards below in lieu of this visible emission standard:

1. Village Green shall maintain a log (written or electronic) of the date, time, and duration of all startups of each unit;
2. Each unit shall be operated in accordance with the manufacturer's emission-related operating instructions;
3. Village Green shall minimize each engine's time spent at idle and minimize each engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply; and
4. Each unit, including any associated air pollution control equipment, shall be operated at all times in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Department that may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the unit.

[06-096 C.M.R. ch. 115, BPT & 06-096 C.M.R. ch. 115, BACT]

- E. The stack for CHP #1 shall be a minimum of 20 feet in height above ground level. [06-096 C.M.R. ch. 115, BACT]

- F. CHP #1 shall meet the applicable requirements of 40 C.F.R. Part 60, Subpart JJJJ, including the following [incorporated under 06-096 C.M.R. ch. 115, BACT]:

1. Emission Standards

CHP #1 shall meet one of the sets of emission standards below, for non-emergency natural gas-fired engines with maximum engine power greater than 1,350 HP manufactured between July 1, 2007, and July 1, 2010. These emission standards shall be met for the life of the engine.

a. Grams per Horsepower-Hour (g/HP-hr)

- (1) 2.0 g/HP-hr for NO_x
- (2) 4.0 g/HP-hr for CO
- (3) 1.0 g/HP-hr for VOC

- b. Parts per Million by Volume, Dry Basis, at 15% Oxygen (ppmvd at 15% O₂)
 - (1) 160 ppmvd for NO_x
 - (2) 540 ppmvd for CO
 - (3) 86 ppmvd for VOC

[40 C.F.R. §§ 60.4233(e) and 60.4234 & 40 C.F.R. Part 60, Subpart JJJJ, Table 1]

2. Emission Standards Compliance Requirements

For owners or operators who purchase a non-certified engine subject to the emission standards specified in 40 C.F.R. § 60.4233(e), compliance with the emission standards shall include the following [40 C.F.R. § 60.4243(b)(2)(ii)]:

- a. Keep a maintenance plan and records of conducted maintenance;
- b. To the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions; and
- c. Conduct an initial performance test within 60 days after achieving the maximum engine output, but not later than 180 days after initial startup of the unit, and conduct subsequent performance testing every 8,760 hours of engine operation or three years, whichever comes first. Each performance test shall be completed according to the procedures in 40 C.F.R. § 60.4244.

3. Testing Requirements

a. Testing Procedures

Village Green shall conduct each performance test for CHP #1 according to the requirements in 40 C.F.R. Part 60, Subpart JJJJ, Table 2, and the following procedures [40 C.F.R. § 60.4244(a) through (c) & 40 C.F.R. Part 60, Subpart JJJJ, Table 2]:

- (1) Each performance test shall be conducted within ten percent of the 100 percent peak (or the highest achievable) load and according to the requirements in 40 C.F.R. § 60.8 and under the specific conditions that are specified by Table 2 of 40 C.F.R. Part 60, Subpart JJJJ;
- (2) Performance tests shall not be conducted during periods of startup, shutdown, or malfunction, as specified in 40 C.F.R. § 60.8(c). If CHP #1 is non-operational, Village Green does not need to startup the engine solely to conduct a performance test; however, the performance test must be conducted immediately upon startup of the engine; and

(3) Village Green shall conduct three separate test runs for each required performance test, as specified in 40 C.F.R. § 60.8(f). Each test run shall be conducted within ten percent of 100 percent peak (or the highest achievable) load and last at least one hour.

b. Test Result Conversion

To determine compliance with the mass per unit output emission limitations, concentrations of NO_x, CO, and VOC shall be converted to mass per unit output according to the equations found in 40 C.F.R. § 60.4244(d) through (f). [40 C.F.R. § 60.4244(d) through (f)]

4. Recordkeeping Requirements

Village Green shall keep the following records for CHP #1 [40 C.F.R. § 60.4245(a) and 06-096 C.M.R. ch. 115, BACT]:

- a. All notifications submitted to comply with 40 C.F.R. Part 60, Subpart JJJJ and all documentation supporting any notification;
- b. Maintenance conducted on the engine; and
- c. Documentation that the engine meets the 40 C.F.R. Part 60, Subpart JJJJ emission standards.

5. Notification and Reporting Requirements

a. Initial Notification

Village Green shall submit an Initial Notification to EPA as required in 40 C.F.R. § 60.7(a)(1). This notification shall include the following information [40 C.F.R. § 60.4245(c)]:

- (1) Name and address of the owner or operator;
- (2) The address of the affected source;
- (3) Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;
- (4) Emission control equipment; and
- (5) Fuel used.

b. Performance Test Results

Village Green shall submit a copy of each performance test as conducted in 40 C.F.R. § 60.4244 within 60 days after the test has been completed. Performance test reports using EPA Method 18, EPA Method 320, or ASTM D6348-03 (incorporated by reference—see 40 C.F.R. § 60.17) to measure VOC require reporting of all QA/QC data. For Method 18, report results from sections 8.4 and 11.1.1.4; for Method 320, report results from sections 8.6.2, 9.0, and 13.0; and for ASTM D6348-03 report results of all QA/QC procedures in Annexes 1-7. [40 C.F.R. § 60.4245(d)]

G. CHP #2 shall meet the applicable requirements of 40 C.F.R. Part 60, Subpart JJJJ, including the following [incorporated under 06-096 C.M.R. ch. 115, BACT]:

1. Emission Standards

CHP #2 shall meet one of the sets of emission standards below, for non-emergency natural gas-fired engines with maximum engine power greater than 1,350 HP manufactured after July 1, 2010. These emission standards shall be met for the life of the engine.

a. Grams per Horsepower-Hour (g/HP-hr)

- (1) 1.0 g/HP-hr for NO_x
- (2) 2.0 g/HP-hr for CO
- (3) 0.7 g/HP-hr for VOC

b. Parts per Million by Volume, Dry Basis, at 15% Oxygen (ppmvd at 15% O₂)

- (1) 82 ppmvd for NO_x
- (2) 270 ppmvd for CO
- (3) 60 ppmvd for VOC

[40 C.F.R. §§ 60.4233(e) and 60.4234 & 40 C.F.R. Part 60, Subpart JJJJ, Table 1]

2. Emission Standards Compliance Requirements

Village Green shall comply with the emission standards in Table 1 of 40 C.F.R. Part 60, Subpart JJJJ using one of the following options [40 C.F.R. § 60.4243(a) and (b)]:

- a. Village Green shall purchase and install an engine certified according to the procedures specified in 40 C.F.R. Part 60, Subpart JJJJ, for the same model year and shall demonstrate continuous compliance by operating and maintaining CHP #2 and any associated control device(s) according to the

manufacturer's emission-related written instructions and keeping records of conducted maintenance on the unit. The unit shall also meet the requirements as specified in 40 C.F.R. Part 1068, Subparts A through D, as they apply to CHP #2. If Village Green adjusts engine settings according to and consistent with the manufacturer's instructions, CHP #2 will not be considered out of compliance; or

- b. Village Green shall purchase a non-certified engine subject to the emission standards specified in 40 C.F.R. § 60.4233(e), and shall demonstrate compliance with the emission standards according to the following requirements:
 - (1) Keep a maintenance plan and records of conducted maintenance;
 - (2) To the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions; and
 - (3) Conduct an initial performance test within 60 days after achieving the maximum engine output, but not later than 180 days after initial startup of the unit, and conduct subsequent performance testing every 8,760 hours of engine operation or three years, whichever comes first. Each performance test shall be completed according to the procedures in 40 C.F.R. § 60.4244.

3. Testing Requirements

Should Village Green elect to install a non-certified engine, CHP #2 shall be subject to the following requirements:

a. Testing Procedures

Village Green shall conduct each performance test for CHP #2 according to the requirements in 40 C.F.R. Part 60, Subpart JJJJ, Table 2, and the following procedures [40 C.F.R. § 60.4244(a) through (c) & 40 C.F.R. Part 60, Subpart JJJJ, Table 2]:

- (1) Each performance test shall be conducted within ten percent of the 100 percent peak (or the highest achievable) load and according to the requirements in 40 C.F.R. § 60.8 and under the specific conditions that are specified by Table 2 of 40 C.F.R. Part 60, Subpart JJJJ;
- (2) Performance tests shall not be conducted during periods of startup, shutdown, or malfunction, as specified in 40 C.F.R. § 60.8(c). If CHP #2 is non-operational, Village Green does not need to startup the engine solely to conduct a performance test; however, the performance test must be conducted immediately upon startup of the engine; and

(3) Village Green shall conduct three separate test runs for each required performance test, as specified in 40 C.F.R. § 60.8(f). Each test run shall be conducted within ten percent of 100 percent peak (or the highest achievable) load and last at least one hour.

b. Test Result Conversion

To determine compliance with the mass per unit output emission limitations, concentrations of NO_x, CO, and VOC shall be converted to mass per unit output according to the equations in 40 C.F.R. § 60.4244(d) through (f). [40 C.F.R. § 60.4244(d) through (f)]

4. Recordkeeping Requirements

Village Green shall keep the following records for CHP #2 [40 C.F.R. § 60.4245(a)]:

- a. All notifications submitted to comply with 40 C.F.R. Part 60, Subpart JJJJ and all documentation supporting any notification;
- b. Maintenance conducted on the engine; and
- c. Documentation that the engine meets the 40 C.F.R. Part 60, Subpart JJJJ emission standards.

5. Notification and Reporting Requirements

Should Village Green elect to install a non-certified engine, the facility shall be subject to the following notification and reporting requirements:

a. Initial Notification

Village Green shall submit an Initial Notification to EPA as required in 40 C.F.R. § 60.7(a)(1). This notification shall include the following information [40 C.F.R. § 60.4245(c)]:

- (1) Name and address of the owner or operator;
- (2) The address of the affected source;
- (3) Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;
- (4) Emission control equipment; and
- (5) Fuel used.

b. Performance Test Results

Village Green shall submit a copy of each performance test as conducted in 40 C.F.R. § 60.4244 within 60 days after the test has been completed. Performance test reports using EPA Method 18, EPA Method 320, or ASTM D6348-03 (incorporated by reference—see 40 C.F.R. § 60.17) to measure VOC require reporting of all QA/QC data. For Method 18, report results from sections 8.4 and 11.1.1.4; for Method 320, report results from sections 8.6.2, 9.0, and 13.0; and for ASTM D6348-03 report results of all QA/QC procedures in Annexes 1-7. [40 C.F.R. § 60.4245(d)]

(17) EGEN #1

- A. EGEN #1 shall be limited to 100 hours of operation per calendar year, excluding operating hours during emergency situations. [06-096 C.M.R. ch. 115, BACT]
- B. Emissions shall not exceed the following [06-096 C.M.R. ch. 115, BACT]:

Unit	PM (lb/hr)	PM ₁₀ (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
EGEN #1	0.08	0.08	0.01	6.32	0.86	0.18

- C. Visible emissions from EGEN #1 shall each not exceed 10% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BACT]
- D. EGEN #1 shall meet the applicable requirements of 40 C.F.R. Part 60, Subpart JJJJ, including the following [incorporated under 06-096 C.M.R. ch. 115, BACT]:

1. Emission Standards

EGEN #1 shall meet one of the sets of emission standards below, for emergency natural gas-fired engines with maximum engine power greater than 130 HP manufactured after January 1, 2009. These emission standards shall be met for the life of the engine.

a. Grams per Horsepower-Hour (g/HP-hr)

- (1) 2.0 g/HP-hr for NO_x
- (2) 4.0 g/HP-hr for CO
- (3) 1.0 g/HP-hr for VOC

- b. Parts per Million by Volume, Dry Basis, at 15% Oxygen (ppmvd at 15% O₂)
 - (1) 160 ppmvd for NO_x
 - (2) 540 ppmvd for CO
 - (3) 86 ppmvd for VOC

[40 C.F.R. §§ 60.4233(e) and 60.4234 & 40 C.F.R. Part 60, Subpart JJJJ, Table 1]

2. Emission Standards Compliance Requirements

Village Green shall comply with the emission standards in Table 1 of 40 C.F.R. Part 60, Subpart JJJJ using one of the following options [40 C.F.R. § 60.4243(a) and (b)]:

- a. Village Green shall purchase and install an engine certified according to the procedures specified in 40 C.F.R. Part 60, Subpart JJJJ, for the same model year and shall demonstrate continuous compliance by operating and maintaining EGEN #1 and any associated control device(s) according to the manufacturer's emission-related written instructions or procedures developed by Village Green that are approved by the manufacturer, and keeping records of conducted maintenance on the unit. The unit shall also meet the requirements as specified in 40 C.F.R. Part 1068, Subparts A through D, as they apply to EGEN #1. If Village Green adjusts engine settings according to and consistent with the manufacturer's instructions, EGEN #1 will not be considered out of compliance; or
- b. Village Green shall purchase a non-certified engine subject to the emission standards specified in 40 C.F.R. § 60.4233(e), and shall demonstrate compliance with the emission standards according to the following requirements:
 - (1) Keep a maintenance plan and records of conducted maintenance;
 - (2) To the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions; and
 - (3) Conduct an initial performance test within 60 days after achieving the maximum engine output, but not later than 180 days after initial startup of the unit according to the procedures in 40 C.F.R. § 60.4244.

3. Non-Resettable Hour Meter

A non-resettable hour meter shall be installed and operated on EGEN #1. [40 C.F.R. § 60.4237(b) and 06-096 C.M.R. ch. 115, BPT]

4. Annual Time Limit for Maintenance and Testing

- a. As an emergency engine, EGEN #1 shall be limited to 100 hours/year for maintenance checks and readiness testing. Up to 50 hours/year of the 100 hours/year may be used in non-emergency situations (this does not include peak shaving, demand response, or to generate income for a facility by providing power to an electric grid or otherwise supply power as part of a financial arrangement with another entity). The limits are based on a calendar year. Compliance shall be demonstrated by records (electronic or written log) of all engine operating hours. [40 C.F.R. § 60.4243(d) and 06-096 C.M.R. ch. 115, BPT]
- b. Village Green shall keep records that include maintenance conducted on EGEN #1 and the hours of operation of the engine recorded through the non-resettable hour meter. Documentation shall include the number of hours the unit operated for emergency purposes, the number of hours the unit operated for non-emergency purposes, and the reason the engine was in operation during each time. [40 C.F.R. § 60.4245(b)]

5. Testing Requirements

Should Village Green elect to install a non-certified engine, EGEN #1 shall be subject to the following requirements:

a. Testing Procedures

Village Green shall conduct the performance test for EGEN #1 according to the requirements in 40 C.F.R. Part 60, Subpart JJJJ, Table 2, and the following procedures [40 C.F.R. § 60.4244(a) through (c) & 40 C.F.R. Part 60, Subpart JJJJ, Table 2]:

- (1) Each performance test shall be conducted within ten percent of the 100 percent peak (or the highest achievable) load and according to the requirements in 40 C.F.R. § 60.8 and under the specific conditions that are specified by Table 2 of 40 C.F.R. Part 60, Subpart JJJJ;
- (2) Performance tests shall not be conducted during periods of startup, shutdown, or malfunction, as specified in 40 C.F.R. § 60.8(c). If EGEN #1 is non-operational, Village Green does not need to start up the engine solely to conduct a performance test; however, the performance test must be conducted immediately upon startup of the engine; and
- (3) Village Green shall conduct three separate test runs for each required performance test, as specified in 40 C.F.R. § 60.8(f). Each test run shall be conducted within ten percent of 100 percent peak (or the highest achievable) load and last at least one hour.

b. Test Result Conversion

To determine compliance with the mass per unit output emission limitations, concentrations of NO_x, CO, and VOC shall be converted to mass per unit output according to the equations found in 40 C.F.R. § 60.4244(d) through (f). [40 C.F.R. § 60.4244(d) through (f)]

6. Recordkeeping Requirements

Village Green shall keep the following records for EGEN #1 [40 C.F.R. § 60.4245(a)]:

- a. All notifications submitted to comply with 40 C.F.R. Part 60, Subpart JJJJ and all documentation supporting any notification;
- b. Maintenance conducted on the engine; and
- c. Documentation that the engine meets the 40 C.F.R. Part 60, Subpart JJJJ emission standards.

7. Notification and Reporting Requirements

Should Village Green elect to install a non-certified engine, Village Green shall submit a copy of the performance test as conducted in 40 C.F.R. § 60.4244 within 60 days after the test has been completed. Performance test reports using EPA Method 18, EPA Method 320, or ASTM D6348-03 (incorporated by reference—see 40 C.F.R. § 60.17) to measure VOC require reporting of all QA/QC data. For Method 18, report results from sections 8.4 and 11.1.1.4; for Method 320, report results from sections 8.6.2, 9.0, and 13.0; and for ASTM D6348-03 report results of all QA/QC procedures in Annexes 1-7. [40 C.F.R. § 60.4245(d)]

(18) **Anaerobic Digester System**

A. Village Green shall operate TOX #1, Flare #2, and the Anaerobic Digester System according to the manufacturers' emission-related instructions. Village Green shall maintain records of all maintenance conducted on TOX #1, Flare #2, and the Anaerobic Digester System. [06-096 C.M.R. ch. 115, BPT]

B. TOX #1

1. TOX #1 (2 MMBtu/hr) shall fire tail gas and a limited amount of natural gas as a supplemental fuel and shall be operated at all times biogas is being treated to a level that meets renewable natural gas standards and is being injected into the natural gas pipeline. [06-096 C.M.R. ch. 115, BACT]

2. Emissions shall not exceed the following [06-096 C.M.R. ch. 115, BACT]:

Unit	PM (lb/hr)	PM₁₀ (lb/hr)	SO₂ (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
TOX #1	0.1	0.1	0.1	0.2	0.2	0.1

3. Visible emissions from TOX #1 shall not exceed 10% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BACT]

C. Flare #2

1. Fuel and Operation

- a. Flare #2 (39.8 MMBtu/hr) shall fire biogas and shall only be operated during periods when the gas cleaning/conditioning/compressing system is down for maintenance purposes or an unplanned outage, when biogas cannot be processed to renewable natural gas standards, and/or when the processed biogas cannot be injected into the natural gas pipeline. [06-096 C.M.R. ch. 115, BACT]
- b. Village Green shall maintain a log (written or electronic) recording the reason, date, time, and duration Flare #2 is operated. [06-096 C.M.R. ch. 115, BACT]

2. Emissions shall not exceed the following:

Unit	Pollutant	lb/MMBtu	Origin and Authority
Flare #2	PM	0.05	06-096 C.M.R. ch. 115, BACT

3. Emissions shall not exceed the following [06-096 C.M.R. ch. 115, BACT]:

Unit	PM (lb/hr)	PM₁₀ (lb/hr)	SO₂ (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Flare #2	0.7	0.7	8.4	2.7	12.3	0.1

4. Visible emissions from Flare #2 shall not exceed 10% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BACT]

The following shall replace Condition (21) of Air Emission License A-1086-71-C-A (January 13, 2014):

(21) **Annual Emission Statement**

- A. In accordance with *Emission Statements*, 06-096 C.M.R. ch. 137, Village Green shall annually report to the Department, in a format prescribed by the Department, the information necessary to accurately update the State's emission inventory. The emission statement shall be submitted as specified by the date in 06-096 C.M.R. ch. 137.
- B. Village Green shall keep the following records in order to comply with 06-096 C.M.R. ch. 137:
1. The amount of natural gas fired in CHP #1, CHP #2, and EGEN #1 (each) on a monthly basis;
 2. The amount of tail gas and natural gas fired in TOX #1 on a monthly basis;
 3. The amount of biogas fired in CHP #1 and Flare #2 on a monthly basis; and
 4. Hours of operation for each emission unit (including TOX #1 and Flare #2) on a monthly basis.

[06-096 C.M.R. ch. 137]

- C. Beginning with reporting year 2020 and every third year thereafter, Village Green shall report to the Department emissions of hazardous air pollutants as required by 06-096 C.M.R. ch. 137, § (3)(C). Village Green shall pay the annual air quality surcharge, calculated by the Department based on these reported emissions of hazardous air pollutants, by the date required in Title 38 M.R.S. § 353-A(3). [38 M.R.S. § 353-A(1-A)]

The following is a new Condition to Air Emission License A-1086-71-A-N (January 13, 2014):

- (23) Village Green shall notify the Department in writing of the initial injection of treated gas into the natural gas pipeline within two weeks of the date of injection. [06-096 C.M.R. ch. 115, BPT]

The following new Condition shall apply until Condition (23) above, is fulfilled:

(24) **H₂S Monitor and Desulfurization Unit**

- A. Village Green shall install and operate a desulfurization unit to reduce H₂S emissions from the Anaerobic Digester System which will be measured by an H₂S monitor. The media in the desulfurization unit shall be replaced when the test results show

breakthrough of H₂S (over 500 ppm). Records shall be maintained of monitor results and dates of when the media is replaced. [06-096 C.M.R. ch. 115, BACT]

- B. The following monitor shall be used to ensure the proper operation of the control device:

Control Device	Operational Monitor
H ₂ S/Gas Scrubber (desulfurization unit)	H ₂ S monitor

Based on the results of initial stack testing, Village Green shall define the thresholds corresponding to the required level of emissions control. Village Green shall maintain records of all maintenance, repair, and calibration activity for the operational monitor. [06-096 C.M.R. ch. 115, BACT]

- C. The H₂S monitor must record accurate and reliable data. If the H₂S monitor is recording accurate and reliable data less than 90% of the source operating time within any quarter of the calendar year, the Department may initiate enforcement action and may include in that enforcement action any period of time that the H₂S monitor was not recording accurate and reliable data during that quarter unless the licensee can demonstrate to the satisfaction of the Department that the failure of the system to record accurate and reliable data was due to the performance of established quality assurance and quality control procedures or unavoidable malfunctions. The H₂S monitor shall be maintained in accordance with manufacturer specifications. [06-096 C.M.R. ch. 115, BPT]

DONE AND DATED IN AUGUSTA, MAINE THIS 22 DAY OF January, 2019.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Melanie Loyzim
MELANIE LOYZIM, ACTING COMMISSIONER

The term of this amendment shall be concurrent with the term of Air Emission License A-1086-71-A-N.

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: September 13, 2018
Date of application acceptance: September 17, 2018

Date filed with the Board of Environmental Protection:

This Order prepared by Jonathan E. Rice, Bureau of Air Quality.

