

#AOP-15-032
DEC# SJ91-0001

Operating Permit Expiration Date: March 4, 2021

State of Vermont
Agency of Natural Resources
Department of Environmental Conservation



Air Quality & Climate Division
Montpelier, Vermont

TITLE V
AIR POLLUTION CONTROL PERMIT
TO CONSTRUCT AND OPERATE

Date Permit Issued: March 4, 2016

Facility: Coventry Municipal Solid Waste Facility
consisting of Coventry Landfill (Landfill
Operation) and Landfill Gas to Energy Operation
(LFGTE Operation)
21 Landfill Lane
Coventry, VT 05825

Permitted Component: Landfill Gas to Energy Operation
21 Landfill Lane
Coventry, VT 05825

Owner and Operator: LFGTE Operation
Coventry Clean Energy Corporation (CCEC)
40 Church Street
East Montpelier, VT 05651

FINDINGS OF FACT

(A) FACILITY DESCRIPTION

New England Waste Services of Vermont, Inc. (also referred to herein as "NEWSVT") owns and operates a municipal solid waste (MSW) landfill (Landfill Operation) on Landfill Lane in the town of Coventry, Vermont. Coventry Clean Energy Corporation (also referred to herein as "CCEC" or "Permittee") owns and operates a landfill gas to energy facility (LFGTE Operation) that is located on property leased from NEWSVT at the unlined area of the Landfill Operation. The LFGTE Operation combusts landfill gas (LFG) from the Landfill Operation in internal combustion engines, and uses these LFG-fired engines to power electrical generators, generating electrical power for sale on the regional electric grid.

The Landfill Operation and the LFGTE Operation are considered to be a single source of air emissions and are collectively referred to herein as "Facility". Allowable emissions from the Facility are the aggregate of emissions from the Landfill Operation and the LFGTE Operation as noted below. NEWSVT is the Permittee for the Landfill Operation as permitted under #AOP-14-034 and CCEC is the Permittee for the LFGTE Operation as permitted herein.

The Facility consists of the Landfill Operation and the LFGTE Operation. The Landfill Operation is comprised of the original unlined landfill, also referred to as Areas A & B, that operated from approximately 1970 until 1992 when it was closed and capped. In 1993 a new, lined landfill began operations near the original landfill and consists of Phases I, II, III and IV. Phase III reached its capacity and Phase IV began acceptance of waste in 2006. A Phase V expansion and its associated gas volumes are accounted for in this permit herein but the expansion has not yet been approved by the Waste Management Division. The LFGTE Operation was constructed in 2005, with the installation of three (3) CAT G3520C LE LFG fired internal combustion engines (CAT G3520C engine) that begin operating on July 12, 2005. A fourth CAT G3520C engine was installed and began operating of January 12, 2007, and a fifth CAT G3520C engine was installed and began operating on June 22, 2009.

NEWSVT is required to actively collect LFG generated by waste decomposition at the Landfill Operation and route the LFG to a combustion device to thoroughly destroy the non-methane organic compounds (NMOCs) contained in the LFG. The LFG collection system consists of a series of LFG collection points including vertical wells drilled into refuse-containing areas of the Landfill Operation as well as horizontal collection trenches and leachate cleanout piping, all connected by piping to a vacuum blower that maintains a negative pressure in the lines to extract LFG from the Landfill Operation.

Collected LFG is either combusted in a flare or flares owned and operated by NEWSVT, or transferred to CCEC where it is treated to remove water and impurities before being used as gaseous fuel in the five (5) CAT G3520C engines at the LFGTE Operation. The five (5) CAT G3520C engines at the LFGTE Operation are rated to generate a maximum of 8.0 megawatts (MW) of electrical power.

CCEC has proposed to increase the carbon monoxide (CO) emission rate from the CAT 3520C engines to 3.5 grams per brake horsepower hour (g/bhp-hr) from the previously permitted 2.75 g/bhp-hr. This increased emission rate results in a significant increase in annual CO emissions, and triggers review as a major modification. As a result of this major modification review, CCEC has proposed to increase the stack heights at the LFGTE Operation.

CCEC has also proposed to install a siloxane removal system (SRS) as part of the LFGTE Operation to remove siloxanes in LFG, and minimize the formation of siliceous deposits in the CAT G3520C engines. Reducing combustion chamber deposits and wear in the engines is anticipated to reduce engine maintenance costs.

Upon issuance of this Permit, the approved operations at the Facility include the following air pollution related operations, equipment and emission control devices:

| Landfill Operation - Specifications | | | |
|--|---------------------------------|---|--|
| Landfill Area/Phase | Years of Operation ¹ | Refuse Capacity (Mg) ² And Landfill Size (acres) | Cumulative Facility Refuse Capacity (Mg) ² / Landfill size (acres) ³ |
| Unlined landfill Areas A & B | 1970 - 1992 | 146,050 (11 acres) | 146,050 / (11 acres) |
| Landfill Phases I, II, and III | 1993 - 2006 | 2,423,504 (34 acres) | 2,569,554 / (45 acres) |
| Landfill Phase IV | 2006 - 2020 | 4,706,259 (45 acres) | 7,275,813 / (90 acres) |
| Landfill Phase V | - 2021 | 1,943,650 (20 acres) | 9,073,413 / (99 acres) |
| Landfill Operation - LFG Combustion Devices | | | |
| LFG Combustion Device | Size/Rating ⁴ | Gas capacity ⁵ | Location, stack height |
| One (1) John Zink Utility Ground Flare | 12" dia. / 75 MMBtu/hr | 2,500 scfm | Lined Landfill; 35' minimum. |
| One (1) Parnel Biogas Utility Ground Flare | 12" dia. / 77.8 MMBtu/hr | 2,500 scfm | Lined Landfill; 35' minimum. |
| Two (2) LTI Model CF-5 Passive Flares (to be removed with relocation of refuse in Areas A & B) | 2" dia. | 60 scfm each | Unlined Landfill: (1) at Area A, (1) at Area B. Minimum 8' stack height each. |

| Landfill Operation - Miscellaneous Equipment | | |
|---|---|--|
| Equipment | Rating | Location |
| Two (2) Used oil Furnaces | 300,000 Btu/each | Maintenance garage |
| Four (4) No. 2 Fuel-oil fired Portable Space Heaters | 2 x 110,000 Btu/each 1 x 175,000 Btu/each 1 x 215,000 Btu/each | Maintenance garage |
| One (1) Fuel-oil fired Portable Space Heater | 85,000 Btu/each | Scale house |
| One (1) Safety-Kleen parts cleaner. | --- | Maintenance garage |
| One (1) Used Oil Tank | 2,000 gallons | Maintenance garage |
| Two (2) Used Oil Tanks | 500 gallons each | Maintenance garage / Scale House |
| Two (2) Diesel Fuel Tanks | 10,000 gallons each | Landfill depot / Contractor staging area |
| Various lubricating oil, hydraulic oil, heating oil and Used oil tanks | <500 gallons each | Various |
| Three (3) Leachate storage tanks | 1 x 20,000 gallon each 1 x 30,000 gallon each 1 x 438,000 gallon each | |

| LFGTE Operation - Equipment | | |
|---|--|---|
| Equipment | Rating | Location |
| Five (5) CAT G3520C Engines Engine 1, 2, and 3: Installed March 2005 Engine 4: Delivered January 12, 2007 Engine 5: Delivered on June 17, 2009 | 2,221 bhp (1,600 kW) each engine 507 scfm LFG fuel flow each engine | LFGTE Operation; 28' minimum, proposed stack height 34' minimum installed no later than 12/31/2016. |
| Two (2) Ethylene Glycol Storage Tanks | 1,000 gallons each | LFGTE Operation |
| One (1) Used Oil Tank | 2,000 gallons | LFGTE Operation |
| One (1) Lube Oil Storage Tank | 8,000 gallons | LFGTE Operation |

| LFGTE Operation - Equipment | | |
|---|---|-----------------|
| Equipment | Rating | Location |
| One (1) Olympian DP100P1 100 kW emergency generator powered with a Perkins 1006-6TG manufactured April 28, 2005 | 140 bhp | LFGTE Operation |
| LFG pretreatment system: IES LFG scrubbing system including a demister knock-out vessel, four (4) gas blower units, three (3) gas cooling units with separator knock-out vessel, one (1) mechanical gas chiller for process water. | 2,500 scfm | LFGTE Operation |
| LFG Siloxane Removal System (SRS): Two (2) temperature swing non-carbon adsorptive dessicant media beds, coalescing pre-filter and particulate after-filter, one (1) media regeneration skid with blower and electrically heated desorption hot air system, one (1) Regen Air pre-heater heat exchanger in loop with engine jacket water piping, flare for destruction of desorbed siloxanes, H ₂ S, and VOCs. Or equivalent devices. | 2,500 scfm LFG inlet, 200 acfm desorption gas at 300F to be mixed with 100 acfm LFG at flare for combustion. | LFGTE Operation |

¹ Years of operation are approximate and are estimated for Phase IV and V.

² Mg – Mega grams. To convert to English tons multiply the Mg value by 1.1025.

³ The Phase V expansion will overlay Areas A and B so the Land fill area will be 99 acres instead of 110 acres.

⁴ bhp – brake horsepower rated output as specified by the manufacturer. kW - kilowatt electrical output.

⁵ scfm - standard cubic feet per minute of LFG. LFG is assumed to contain 40% - 60% methane with the balance predominately carbon dioxide but also includes ~524 ppm nonmethane organic compounds (NMOCs) based on prior testing at the Landfill. The maximum LFG generation rate is predicted to be 5,545 scfm in 2021 based on the LandGEM model ver. 3.02 with values of L₀ of 130 and k of 0.06. LFG capture efficiency is assumed to be 85% over the life of the Landfill.

(B) FACILITY CLASSIFICATION

The Facility is classified as a source of air contaminants pursuant to Title 10 of the *Vermont Statutes Annotated* ("10 VSA") §555 and §5-401(16) [Any source...which would otherwise be subject to regulation pursuant to the Clean Air Act, as amended (42 USC 7401, et seq.)] and (17) [Such other sources as may be designated as air contaminant sources by the Air Pollution Control Officer on a case-by-case basis] of the *Vermont Air Pollution Control Regulations* (hereinafter "*Regulations*").

In addition, §5-101 of the *Regulations* defines a *stationary source* as any structure(s), equipment, installation(s), or operation(s), or combination thereof, which emit or may emit any air contaminant, which is located on one or more contiguous or adjacent properties and which is owned or operated by the same person or persons under common control. Based on this definition, all of the equipment, operations, and structures at the Facility are grouped together by the Agency of Natural Resources, Department of Environmental Conservation, Air Quality & Climate Division (hereinafter "Agency") as one stationary air contaminant source for purposes of review under the *Regulations*.

Accordingly, the Landfill Operation and the LFGTE Operation are considered to be a single source of air emissions, and are collectively referred to herein as "Facility". Allowable emissions from the Facility are the aggregate of emissions from the Landfill Operation and the LFGTE Operation. Two separate permits have been prepared for this single Facility. NEWSVT is the Permittee for the Landfill Operation as permitted under #AOP-14-034 and CCEC is the Permittee for the LFGTE Operation as permitted herein.

(C) PRIOR AGENCY ACTIONS/APPROVALS

The Facility has been issued the following "Permit to Construct" approvals pursuant to 10 VSA §556 and §§5-501 and 5-502 of the *Regulations* and the following "Permit to Operate" approvals pursuant to 10 VSA §556a and Subchapter X of the *Regulations*. Previous permits for the Facility were solely issued to NEWSVT. However, the LFGTE Operation has been incorporated into the permit for the Facility since the December 16, 2004 issuance of #AOP-03-044.

| Prior Agency Approvals and Actions | |
|------------------------------------|--|
| Date of Action | Description of Agency Approval/Action |
| November 13, 1992 | #AP-92-020 – Original Agency Permit to Construct approval for construction of the lined landfill at the Facility. The Permit included requirements for gas collection and control on the existing unlined landfill that was to be closed and the proposed lined landfill expansion at the same site. |
| December 15, 1995 | #AP-92-020A – Amended Permit to Construct to allow interim "passive" gas collection with passive flare controls on the closed <u>unlined</u> landfill rather than "active" gas collection as required for the <u>lined</u> landfill. This Permit and #AP-92-020 approved Phase I and Phase II of the lined landfill. Construction approval for Phase III was included in the Solid Waste Certification issued jointly by the Air and Solid Waste Programs on July 9, 1999. |
| December 16, 2004 | #AOP-03-044 - Major modification Permit to Construct and initial Title V Permit to Operate approving Phases I-IV and an LFGTE Operation comprised of 4 CAT G3520C engines rated at 2,221 bhp and 1.6 MW each for a total of 6.4 MW of power. |
| June 24, 2008 | #AOP-06-060 – Major modification Permit to Construct and Title V Operating permit approving the Phase V expansion, and the addition of one (1) CAT G3520C engine rated at 2,221 bhp and 1.6 mW to the existing LFGTE Operation. This brings the total number of CAT G3520C engines in the LFGTE Operation at the Facility to five (5), and the total output of the LFGTE Operation to 8.0 MW of electric power. |

(D) FACILITY PERMIT APPLICABILITY

As noted above, the Facility is classified as a source of air contaminants under §5-401 of the *Regulations*. Pursuant to 10 VSA §556 and §5-501 of the *Regulations* a Permit to Construct, or an amendment to any existing Permit to Construct, must be obtained before commencing the construction, installation, modification or operation of an air contaminant

source. The proposed increase in the allowable CO emissions from the five (5) CAT G3520C engines at the LFGTE Operation is considered a modification to the Facility under the *Regulations* and consequently a Permit to Construct must be obtained. As the Facility includes operations by two Permittees, the individual permits held by each Permittee must be modified in the event of a change at the Facility.

Pursuant to 10 VSA §556a and Subchapter X of the *Regulations* a Permit to Operate is required for any air contaminant source with allowable emissions of all air contaminants combined of ten (10) tons per year ("tpy") or more or that is otherwise subject to Title 40 *Code of Federal Regulations* ("40 CFR") Part 70. Allowable emissions from the Facility in the future are estimated to be greater than ten (10) tpy combined and emissions of carbon monoxide (CO) are estimated to be in excess of the one-hundred (100) tpy threshold for applicability of Title V of the federal Clean Air Act. In addition, pursuant to Title 40 of the *Code of Federal Regulations* ("40 CFR") Subpart WWW - Standards of Performance for Municipal Solid Waste Landfills - Part 60.752(b) the Landfill Operation is considered a Title V source since the design capacity of the Landfill Operation exceeds 2.5 million Mg.

Therefore, pursuant to §§5-1002, 5-1003, and 5-1005 of the *Regulations* the Facility is classified as a "Title V Subject Source" and must obtain a Permit to Operate consistent with the requirements of Subchapter X of the *Regulations* and Title 40 *Code of Federal Regulations* ("40 CFR") Part 70.

In accordance with 10 VSA §556(e) the Agency has combined the Permit to Construct and the Permit to Operate modification and renewal for this Facility into a combined Permit to Construct and Operate. The allowable emissions for the Facility are summarized below:

| Future Allowable Facility Air Contaminant Emissions (tons/year)¹ | | | | | | |
|--|-----------------------|-----------------------|-----------|-------------|-----------------------|-------------------------|
| PM/PM₁₀/PM_{2.5} | SO₂ | NO_x | CO | VOCs | Total Criteria | HAPs² |
| <19.8 | <40 | 76.0 | 495 | <50 | >10 | >10/25 |

¹ PM/PM₁₀/PM_{2.5} - particulate matter and particulate matter of 10 micrometers and 2.5 micrometers in size or smaller, respectively; SO₂ - sulfur dioxide; NO_x - oxides of nitrogen measured as NO₂ equivalent; CO - carbon monoxide; VOCs - volatile organic compounds; HAPs - hazardous air pollutants as defined in §112 of the federal Clean Air Act. Emissions are based on: (1) the maximum predicted gas generation rate from the Landfill Operation of 5,545 scfm (2) 50% methane in the LFG, (3) 75%-95% gas collection efficiency from the Landfill Operation (4) the worst case emissions scenario of the engines at full load (2,537.5 scfm) with the flares consuming the remaining (2,462.5 scfm) and (5) PM, NO_x and CO based on manufacturer data, VOCs emissions based on NMOCs in LFG that are 39% VOCs and 98% destruction of the collected NMOCs/VOCs and the estimated formation of aldehydes in the CAT 3520C engines as a combustion by-product, SO₂ based on Total Reduced Sulfur (TRS) of 400 ppm TRS, which is anticipated to be a conservative measure of TRS in LFG at the Facility.

² Emission of an individual HAP (formaldehyde) from the CAT 3520C engines is estimated as >10 tpy and emissions of total HAPs from the Facility are estimated at >25 tpy.

(E) REVIEW FOR THE PERMIT TO CONSTRUCT

(a) New Source Review Designation

The Facility, prior to the increase in the allowable CO emissions from the five (5) CAT G3520C engines is designated as a major stationary source of air contaminants since it has allowable emissions of nitrogen oxides (NO_x) and carbon monoxide (CO) of fifty (50) tons per year or greater. Consequently, any *modification* of the source that would result in a significant increase in emissions of any air contaminant, as defined in §5-101 of the *Regulations*, is designated as a major modification and is subject to review under §5-501 and §5-502 of the *Regulations*. The proposed project identified in Findings of Fact (A) above, together with all previous minor modifications constructed at the Facility since July 1, 1979, and which have not been previously reviewed under §5-502 of the *Regulations*, will result in a significant increase in emissions of CO. Consequently, the proposed modification is designated as a major modification and is subject to the requirements of §5-502 of the *Regulations*.

(b) Most Stringent Emission Rate

Pursuant to §5-502 of the *Regulations*, each new major stationary source or major modification must apply control technology adequate to achieve the Most Stringent Emission Rate ("MSER") with respect to those air contaminants for which there would be a major or significant actual emissions increase, respectively, but only for those currently proposed physical or operational changes which would contribute to the increased emissions.

The proposed modification to alter the CO emission rate limitation is a revision of a previously established MSER emission limit and consequently is subject to review under the MSER requirements in §5-502 of the *Regulations* for the pollutant carbon monoxide (CO).

The Agency has re-evaluated the prior MSER for CO and revised the emissions limit contained in the MSER. Operating experience at this and other landfills across the country has shown that LFG contains siloxane compounds derived from consumer products in the refuse. When siloxanes are combusted, they result in cement-like deposits on internal engine components, interfering with combustion chamber geometry, and resulting in increasing CO emissions over time. While these deposits can be removed from the engine on a periodic basis by removing the cylinder heads and grinding out the deposits, CO emissions are anticipated to continuously increase between these cleanings. The engine manufacturer recommends annual removal of these deposits from the engine components followed by a more extensive on-site in-frame cleaning every three years and an even more extensive off-site overhaul every 6 years. Carbon monoxide emissions between annual cleanings are anticipated to remain below a maximum of 3.5 g/bhp-hr. The standard annual cleaning is expected to reduce carbon monoxide emissions to 3.1 g/bhp-hr or less but it is not until the 6 year cleaning that emissions

are anticipated to reliably achieve compliance with the like new 2.75 g/bhp-hr emission limit for CO. Therefore, this permit amendment is revising the MSER for CO to 3.5 g/bhp-hr to apply at all times with additional emission limits of 3.1 g/bhp-hr to be demonstrated by a compliance test at least once every two years and 2.75 g/bhp-hr to be demonstrated by a compliance test at least once every six years

The NOx emissions from the Facility did not increase by a significant amount under #AOP-06-060 or under this Permit herein, therefore NOx emissions are not subject to re-evaluation at this time and the prior NOx MSER established under #AOP-03-044 remains in effect.

The PM emissions for the Facility are greater than originally estimated in the previous permits, based on the results of PM emissions testing of the engines at the Facility in 2012. The increase in PM emissions from the Facility, based on revised PM emission factors for the engines, will be limited to less than 10 tons per year for PM, so that the increase in PM emissions will not exceed the 10 ton per year significance level for PM_{2.5}. With this limitation, PM emissions are not subject to an MSER evaluation at this time.

The following MSER determinations have been made at this Facility:

| Most Stringent Emission Rate Determinations | | |
|--|------------------|--|
| Permit # | Pollutant | Description/Emission limit |
| Established under: #AOP-03-044 | CO | CAT G3520C Engines: 2.75 g/bhp-hr and 13.5 lb/hour (each) John Zink Flare: 0.37 lb/MMBtu |
| CO re-established under: #AOP-06-060 CO revised below. | | CAT G3520C Engines: 0.5 g/bhp-hr and 2.45 lb/hour (each) John Zink Flare: 0.068 lb/MMBtu |
| Established under: #AOP-15-032 | CO | CAT G3520C Engines – 3.5 g/bhp-hr and 17.3 lb/hr (each) applies at all times 3.1 g/bhp-hr and 15.3 lb/hr (each) must be demonstrated every two (2) years 2.75 g/bhp-hr and 13.5 lbs/hour (each) must be demonstrated every six (6) years John Zink & Parnel Biogas Flares: 0.37 lb/MMBtu |

(c) Ambient Air Quality Impact Evaluation

The Agency's implementation procedures concerning the need for an AQIE under §5-406(1) of the *Regulations*, specifies that such analyses may be required when a project results in an allowable emissions increase of ten (10) tons per year or more of any air contaminant, excluding VOCs. Additionally, the Agency may require an AQIE where the short-term allowable emission rates will significantly increase as a result of a project.

Based on the proposed level of emissions increase from this Facility, the Agency required a revised AQIE for the pollutants CO, NO_x, PM/PM₁₀/PM_{2.5} and SO₂. Since CO emission increases also exceed the significance threshold of fifty (50) tons per year, the Agency's implementation procedures require the AQIE to determine which other nearby sources, if any, must be included in the analysis. Any other nearby source that has a significant impact area for a respective pollutant that overlaps with the proposed Facility's significant impact area for that same pollutant must be included in the AQIE. All other nearby sources are assumed to be included in the ambient background value for the pollutant. The ambient background value is determined from the Agency's ambient monitoring network throughout the State. For PM, the nearby sources potentially required to be included in the AQIE were the Columbia Forest Products facility (CFP) in Newport, Vermont and the Ethen Allen, Inc. facility (EAO) in Orleans, Vermont. However, since the significant impact areas for CFP or EAO did not overlap with the Facility's significant impact area for PM_{2.5}, these facilities were not included in the AQIE.

The Facility emissions used in the AQIE are based on the maximum projected volumes of LFG generation and the highest level of emissions generated from the two potential operating scenarios: (1) all the gas being burned in the flares, or (2) the engines burning the maximum amount of gas they are capable of with any excess gas being burned in the flares. The engines have higher emission rates than the flares and similar dispersion characteristics thus the scenario involving engine operation is worst case for ambient impacts.

The Facility was found to comply with all applicable ambient air quality standards and prevention of significant deterioration increments.

| NAAQS Review – #AOP-15-032 | | | | | | |
|-----------------------------------|------------------|-------------------------------|--------------------|-------------|--------------|-------|
| Pollutant | Averaging Period | Modeled Concentration (µg/m³) | Background (µg/m³) | Sum (µg/m³) | AAQS (µg/m³) | Pass? |
| CO | 8-hr | 480.5 | 1,260 | 1,740.5 | 10,305 | Yes |
| NOx | 1-hr | 104.1 | 65.8 | 169.9 | 188 | Yes |
| | Annual | 2.1 | 13.4 | 15.5 | 100 | Yes |
| PM _{2.5} | 24-hr | 7.5 | 18.0 | 25.5 | 35 | Yes |
| | Annual | 0.86 | 6.8 | 7.7 | 15 | Yes |
| PM ₁₀ | 24-hr | 8.3 | 34.0 | 42.3 | 150 | Yes |
| SO ₂ | 1-hr | 139.8 | 47.1 | 186.9 | 196 | Yes |
| | 3-hr | 103.3 | 47.1 | 150.4 | 1,309 | Yes |

| PSD Increment Review – #AOP-15-032 | | | | | | |
|---|------------------|-------------------------------|---|--|--|-------|
| Pollutant | Averaging Period | Modeled Concentration (µg/m³) | Maximum Allowable Class II PSD Increment Standard (µg/m³) | Previously Consumed Class II PSD Increment (µg/m³) | Class II PSD Increment Available (µg/m³) | Pass? |
| NOx | Annual | 2.1 | 25 | 7.4 | 11.8 | Yes |
| PM _{2.5} | 24-hr | 6.4 | 9 | 0 | 6.8 | Yes |
| | Annual | 0.64 | 4 | 0 | 1.0 | Yes |
| PM ₁₀ | 24-hr | 8.3 | 30 | 0 | 22.5 | Yes |
| SO ₂ | 3-hr | 103.3 | 512 | 0 | 512 | Yes |

(F) REVIEW FOR THE PERMIT TO OPERATE

(a) Applicable Requirements

The operations at the Facility are subject to the following state and federal laws and regulations, the requirements of which are embodied in the conditions of this Permit.

(i) *Vermont Air Pollution Control Regulations:*

| Applicable Requirements from the Vermont Air Pollution Control Regulations |
|---|
| Section 5-201 – Prohibition of Open Burning |
| Section 5-211(2) - Prohibition of Visible Air Contaminants, Installations Constructed Subsequent to April 30, 1970. |
| Section 5-221(1) - Prohibition of Potentially Polluting Materials in Fuel, Sulfur Limitation in Fuel. |
| Section 5-221(2) - Prohibition of Potentially Polluting Materials in Fuel, Used Oil. |
| Section 5-231(3) - Prohibition of Particulate Matter; Combustion Contaminants. |
| Section 5-231(4) - Prohibition of Particulate Matter; Fugitive Particulate Matter. |
| Section 5-241(1) and (2) – Prohibition of Nuisance and Odor. |
| Section 5-253.14 - Control of Volatile Organic Compounds from Solvent Metal Cleaning. |
| Section 5-261(2) – Control of Hazardous Air Contaminants - Hazardous Most Stringent Emission Rate. |
| Section 5-271 – Control of Air Contaminants from Stationary Reciprocating Internal Combustion Engines. |
| Section 5-402 – Written Reports When Requested. |
| Section 5-403 – Circumvention. |
| Subchapter VIII – Registration of Air Contaminant Sources. |
| Subchapter X – Operating Permits. |

(ii) Reasonably Available Control Technology - §5-1010 of the *Regulations*

Pursuant to 10 VSA §556a(d) and §5-1010 of the *Regulations* the Agency may establish and include within any Permit to Operate emission control requirements based on Reasonably Available Control Technology ("RACT"). Based on the Facility's existing levels of emissions and emission controls, the Agency has not imposed any further requirements on this Facility under this authority at this time.

(iii) Existing Air Pollution Control Permit to Construct and/or Operate

The Facility currently operates under the confines of a Permit to Construct and Operate issued on June 24, 2008 (#AOP-06-060). The conditions within that existing permit applicable to the LFGTE Operation are considered applicable requirements pursuant to §5-1002 of the *Regulations*. The requirements of that permit which are not being modified herein are incorporated into this new combined Permit to Construct and Operate (#AOP-15-032).

(iv) Federal Requirements:

| Federal Regulations and Clean Air Act Requirements Applicable to the Facility |
|--|
| <p>40 CFR Part 60, Subpart WWW - Standards of Performance for Municipal Solid Waste Landfills. §60.752 Standards - Requires landfill gas collection and control system. §60.753 Operational Standards - Operational requirements of the gas collection and control system. Applicable to all MSW landfills with a design capacity of 2.5 million mega-grams (Mg) or greater, however the requirement to install the landfill gas collection and control system is only required once uncontrolled emissions of nonmethane organic compounds (NMOCs) from the landfill equal or exceed 50 Mg/year.</p> <p><i>The Facility is subject to this regulation. The Landfill Operation has an existing design capacity (unlined through Phases IV) of 7,275,813 Mg and Phase V will add an additional capacity of 1,943,650 Mg. Uncontrolled NMOC emissions were predicted to first exceed 50 Mg in the year 2001.</i></p> |
| <p>40 CFR Part 60 Subpart Cc – Emission Guidelines for Municipal Solid Waste Landfills. Applies to existing landfills which commenced construction, modification, or reconstruction before May 30, 1991, and that have accepted waste at any time since November 8, 1987, or have additional capacity for future waste deposition.</p> <p><i>This regulation is not applicable to the Facility. The Landfill Operation was modified subsequent to May 30, 1991 to increase its capacity, thus becoming subject to 40 CFR Part 60 Subpart WWW.</i></p> |

**Federal Regulations and Clean Air Act Requirements
Applicable to the Facility**

40 CFR Part 60, Subpart Kb - Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984. Applicability: The affected facility to which this subpart applies is each storage vessel with a capacity greater than or equal to 75 m³ (19,804 gal) that is used to store volatile organic liquids (including petroleum). This subpart does not apply to the following:

1. Any storage vessel with a capacity less than 75 m³
2. Any storage vessel storing a liquid with a vapor pressure less than 3.5 kPa
3. Any storage vessel with a capacity > 75 m³ and <151 m³ with a v.p. <15.0 kPa
4. Pressure vessels >29.7 psi and without emissions to the atmosphere.
5. Vessels permanently attached to mobile vehicles.
6. Vessels located at bulk gasoline plants.
7. Vessels located at gasoline service stations.

For affected facilities, there are recordkeeping requirements and depending upon the material stored there may be standards for the tank's vent system.

The storage tanks at the Facility store No. 2 fuel oil, new and used engine oil, ethylene glycol, and landfill leachate, all of which have a vapor pressure of less than 3.5 kPa. Accordingly, the Facility has no storage tanks subject to this regulation.

40 CFR Part 60, Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE). Applies to CI RICE model year 2007 and later as well as those ordered after July 11, 2005 and with an engine manufacture date after April 1, 2006. This standard also applies to stationary CI RICE that are modified or reconstructed after July 11, 2005. This regulation established emission rates for affected engines, requires routine engine maintenance and sets maximum sulfur content for the diesel fuel. Beginning October 1, 2010 applicable engines shall only use diesel fuel with a maximum sulfur content of 15 ppm (ULSD).

Subpart IIII is not applicable to the Perkins 1006-6TG engine powering the emergency generator at the LFGTE Operation. The engine was not ordered after July 11, 2005, and was manufactured before April 1, 2006.

40 CFR Part 60, Subpart JJJJ - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines. Applies to new spark ignition engines ordered after June 12, 2006 AND manufactured on or after July 1, 2007.

Engines No 1, 2, and 3 were installed as part of the LFGTE Operation at the Facility in March 2005 therefore are not subject to this regulation.

Engine No. 4 was ordered after June 12, 2006 (order date Nov. 6, 2006) but the engine was manufactured before July 1, 2007 (build date Oct. 26, 2006), and was delivered on January 12, 2007. Accordingly, this engine is not subject to Subpart JJJJ.

Engine No. 5 was delivered on June 17, 2009 and Subpart JJJJ applies to this engine.

**Federal Regulations and Clean Air Act Requirements
Applicable to the Facility**

40 CFR Part 61, Subpart M - National Emission Standards for Hazardous Air Pollutants: National Emission Standard for Asbestos. Applies to: the owner or operator of a demolition or renovation activity, including regulated asbestos-containing material (RACM) demolition and renovation operations, which are regulated under §61.145 of this Subpart. Waste generated from these activities shall be disposed of in accordance with the requirements of §61.150 of this Subpart. Waste disposal facilities receiving waste that is to be disposed of in accordance with §61.150 of this Subpart shall be operated in accordance with the provisions of §61.154 of this Subpart.

Waste disposal facilities subject to this rule, shall be operated with no visible emissions to the outside air from areas of RACM disposal, or shall have barriers and signage restricting access to areas of RACM disposal, or shall cover areas of RACM disposal on a daily basis. Waste disposal facilities receiving RACM shall also maintain records of material receipt and shall submit records to the Administrator identifying areas of RACM disposal upon closure of the landfill, and shall notify the Administrator prior to disturbing areas of RACM disposal.

Subpart M is anticipated to apply to the Facility, specifically to disposal of RACM at the Landfill Operation.

40 CFR Part 63, Subpart AAAA - National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills. §63.1955 Standards - Requires gas collection and control system meeting the same standards as 40 CFR Part 60, Subpart WWW by referencing such. Applicable to all MSW landfills that are (1) a major source of Hazardous Air Pollutants (HAPs), or (2) are collocated with a major source of HAPs, or (3) are an area source with a design capacity of 2.5 million megagrams (Mg) or greater and have estimated uncontrolled emissions of NMOCs equal to or greater than 50 Mg/year.

The Facility is subject to this regulation. The Landfill Operation is not a major source of HAPs, but is collocated with the LFGTE Operation which is a major source of HAPs and the Landfill Operation has a design capacity of 2.5 million Mg or greater and has estimated uncontrolled emissions of NMOCs greater than 50 Mg/year. Compliance will be addressed by complying with the provisions of 40 CFR Part 60 Subpart WWW.

**Federal Regulations and Clean Air Act Requirements
Applicable to the Facility**

40 CFR Part 63, Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines. Applies to new engines >500 hp that commenced construction (installed) on or after December 19, 2002 at a major sources of HAPs. Also applies to existing engines of greater than 500 bhp that commenced construction (installed) prior to December 19, 2002 located at major HAP sources. Engines <500 hp that are located at major sources of HAPs are considered existing if they were installed before June 12, 2006.

A new or reconstructed stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions which combusts landfill or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis must meet the initial notification requirements of §63.6645(f) and the requirements of §§63.6625(c), 63.6650(g), and 63.6655(c). These stationary RICE do not have to meet the emission limitations and operating limitations of Subpart ZZZZ.

An existing emergency-use only stationary RICE with a rating of < 500 hp located at a major source of HAP emissions is subject to maintenance requirements, and must install an elapsed hour meter.

Engines No 1, 2, and 3 were installed at the Facility in March 2005, making the Facility a major HAP source since HAP emissions from these three engines combined likely exceeded the 10 ton per year emission of a single HAP (formaldehyde). Thus these three engines are subject to the new engine requirements of a major HAP source under Subpart ZZZZ.

Engine No. 4 was delivered on January 12, 2007 and Subpart ZZZZ at that time required new engines to comply with NSPS Subpart JJJJ. However the applicability of NSPS Subpart JJJJ was written to apply to engines manufactured on or after July 1, 2007. Thus Subpart ZZZZ applies to this engine but has no applicable requirements and the engine is not subject to NSPS Subpart JJJJ.

Engine No. 5 was delivered on June 17, 2009 and complies with the requirements of Subpart ZZZZ by conforming to the requirements of 40 CFR Part 60, Subpart JJJJ.

The Perkins 1006-6TG engine powering the emergency generator at the LFGTE Operation was installed before June 12, 2006, and is rated at approximately 140 hp. This engine is considered an existing emergency-use only stationary RICE < 500 hp, and must install an elapsed hour meter, and is subject to maintenance requirements including changing oil & filter and, inspecting and replacing, if necessary, air filter, hoses and belts.

**Federal Regulations and Clean Air Act Requirements
Applicable to the Facility**

Clean Air Act §§114(a)(3) Inspections, Monitoring and Entry; 502(b) Permit Programs; and 504(a)-(c) Permit Requirements and Conditions; 40 *CFR* Part 64 Compliance Assurance Monitoring; 40 *CFR* Part 70 §§70.6(a)(3)(i)(B) and 70.6(c)(1) State Operating Permit Programs - Permit content. Upon renewal of a Title V Permit to Operate, a facility must comply with enhanced monitoring and compliance assurance monitoring requirements if applicable. The CAM rule applies to each Pollutant Specific Emission Unit (PSEU) at a major source that is required to obtain a part 70 or part 71 permit if the unit satisfies all of the following criteria: 1) The unit is subject to an emission limitation or standard for the applicable regulated air pollutant other than an emissions limitation or standard that is exempt under §64.2(b)(1) [exempt limitations include emission limitations or standards proposed by the Administrator after November 15, 1990 pursuant to Section 111 or 112 of the Act], 2) The unit uses a control device to achieve compliance with any such limit or standard; and 3) The unit has pre-control device emissions of the applicable regulated pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source.

The CAM rule applies to the CAT 3520C engines and the flares at the Facility. The engines and flares are considered an emission control device for VOCs. CAM is being established as continuous monitoring for the presence of a flame on the flares when they are combusting LFG and continuous monitoring and recording of engine exhaust temperature and compliance testing at least once every two years for combustion efficiency of 98% or outlet NMOC concentration of 20 ppmvd and CO emission rate.

Clean Air Act §112r Prevention of Accidental Release; 40 *CFR* Part 68 Chemical Accident Prevention Programs. Facilities that have more than the threshold quantity of a regulated substance in a process are subject to these provisions including the requirements to conduct a hazard assessment, establish a prevention program and develop a risk management plan.

The Permittee has stated that the Facility does not store more than the threshold quantity of a regulated substance and thus is not subject to these requirements.

Clean Air Act §608 National recycling and emission reduction program; 40 *CFR* Part 82, Protection of Stratospheric Ozone, Subpart F – Recycling and Emissions Reductions. This requirement is applicable to any facility that owns, services, maintains, repairs, and disposes of appliances containing ozone depleting substances.

This regulation is applicable to the Trane RTAA 125-ton rotary chiller at the LFGTE Operation

**Federal Regulations and Clean Air Act Requirements
Applicable to the Facility**

40 CFR Part 98 Mandatory Greenhouse Gas Reporting. Requires reporting of GHG emissions annually to EPA for 1) facilities in source categories listed in §98.2(a)(1) including electric utility units subject to Acid Rain, MSW landfills that generate CH₄ in amounts equivalent to 25,000 metric tons of CO₂e or more per year and electrical transmission and distribution equipment at facilities where the total nameplate capacity of SF₆ and PFC containing equipment exceeds 17,820 pounds, 2) facilities in source categories listed in §98.2(a)(2) including electronics manufacturing, iron and steel production and pulp and paper manufacturing that emit 25,000 metric tons of CO₂e or more per year from such source categories as well as all stationary combustion, 3) facilities with stationary combustion sources that aggregate to 30 MMBTU/hr or more and which emit 25,000 metric tons of CO₂e or more per year from all stationary combustion sources combined, and 4) fuel suppliers including all local natural gas distribution companies.

The U.S. EPA has retained the implementing authority for this regulation and is responsible for determining applicability. This regulation under Part 98 is not considered to be an applicable requirement per 40 CFR Part 70.2 and as noted in 74 FR 56260 (October 30, 2009). Part 98 is anticipated to apply to the Landfill Operation at the Facility and NEWSVT has been reporting emissions for applicable years.

(b) Non-Applicable Requirements

Pursuant to §5-1015(a)(14) of the *Regulations*, an owner or operator of a Facility may request a permit shield from specific state or federally enforceable regulations and standards which are not applicable to the source. The Permittee has requested a permit shield with respect to several potentially applicable requirements. The Agency has reviewed this request and is hereby granting a permit shield in accordance with §5-1015(a)(14) of the *Regulations* for the following requirements which have been determined not to be applicable to the Facility based on the information provided by the Permittee:

Non-Applicable Requirements for which a Permit Shield is Granted

§5-231(1) - Prohibition of Particulate Matter: Industrial Process Emissions. The Agency has determined that the combustion of LFG is not considered an industrial process since gaseous fuels are not considered part of the *process weight* input into a process. Therefore, the combustion of LFG is not subject to this regulation.

§5-231(3) - Prohibition of Particulate Matter: Combustion Contaminants. The Agency has determined that LFG is not a *fossil fuel* under the definition in the *Regulations* therefore this regulation is not applicable to the John Zink, and Parnel Biogas Landfill Operation flares, the SRS flare, or engines that combust LFG. However, the other fuel burning equipment at the Facility including the No.2 fuel oil space heating units, the used oil furnace, and the backup generator at the LFGTE Operation are subject.

Non-Applicable Requirements for which a Permit Shield is Granted

§5-241(3) - Prohibition of Nuisance and Odor: Control of Odors from Industrial Processes. While the Facility is subject to §5-241(1) and (2), the Agency has not previously classified all landfills as industrial processes subject to §5-241(3) and does not currently consider the Facility subject to this regulation. This regulation may become applicable at any point in the future upon a determination by the Air Pollution Control Officer that operations at the site are an odiferous process per se. In addition, in order to ensure compliance with other applicable requirements for this Facility, most of these emission control measures are required under separate authority.

(c) Enforceability

This section delineates which permit conditions are federally enforceable and which conditions are state only enforceable. All federal enforceable conditions are subject to federal citizen suit provisions. All conditions of this Permit are enforceable by both state and federal authorities.

(d) Compliance Certification

The Permittee is required by this Permit to certify compliance as part of their annual registration with the Agency pursuant to the requirements of Subchapter X of the *Regulations*. Additionally, this Permit requires the submission of semi-annual reports of monitoring records used to demonstrate compliance with the limitations contained in this Permit.

(G) HAZARDOUS MOST STRINGENT EMISSION RATE

Pursuant to §5-261 of the *Regulations*, any stationary source subject to the rule¹ with current or proposed actual emissions of a hazardous air contaminant (HAC) equal to or greater than the respective Action Level (found in Appendix C of the *Regulations*) shall be subject to the Regulation and shall achieve the Hazardous Most Stringent Emission Rate (HMSEER) for the respective HAC. HMSEER is defined as a rate of emissions which the Secretary, on a case-by-case basis, determines is achievable for a stationary source based on the lowest emission rate achieved in practice by such a category of source and considering economic impact and cost. HMSEER may be achieved through application of pollution control equipment, production processes or techniques, equipment design, work practices, chemical substitution, or innovative pollution control techniques.

While LFG is primarily composed of methane and carbon dioxide from decomposing refuse within a landfill, the LFG becomes contaminated with volatile compounds contained in the refuse as it flows through the refuse in the landfill. These compounds are collectively referred to as non-methane organic compounds (NMOCs), and many of the NMOCs are also HACs. As part of the review for Air Pollution Control Permit #AP-92-020 issued November 13, 1992, the Agency determined that the Facility would have regulated

¹ APCR §5-261(1)(c)(ii) provides that solid fuel burning equipment (not including incinerators) installed or constructed prior to January 1, 1993, and all fuel burning equipment which combust virgin liquid or gaseous fuel shall not be subjects to the requirements of §5-261.

emissions of several hazardous air contaminants in excess of their respective Action Levels if the LFG was allowed to vent to the ambient air uncontrolled. The Agency subsequently determined HMSER to be the installation and operation of a LFG collection and control system that captures the LFG and routes it to a combustion device with a minimum ninety-eight (98) percent destruction efficiency of the NMOCs. Flares designed and operated in accordance with 40 *CFR* Part 60.18 were and still are considered an acceptable method of compliance with this requirement. None of the emissions were estimated to exceed their respective Action Levels after initiation of the emission controls.

Since that original permit, samples of the LFG at the Facility have been collected and analyzed for NMOCs/HACs in both 1993 (525 ppm) and again in 2002 (561 ppm). Based on these results, the Facility is still anticipated to have emissions of several HACs in excess of their respective Action Level if allowed to vent uncontrolled and therefore the Facility is subject to HMSER under §5-261 of the Regulations. Also since that original permit, the U.S. EPA has promulgated two similar federal regulations that require similar gas collection and control requirements, to which the Facility is now subject. Based on this information, the Agency has determined that HMSER shall continue to be the requirement to effectively capture the LFG and achieve the minimum 98% destruction efficiency of the NMOCs in the collected LFG as required by the prior HMSER and the federal regulations or alternatively demonstrate that the outlet concentrations of NMOCs from the treatment devices are less than 20 ppmvd as hexane. In addition, the Landfill Operation must also comply with various requirements for the collection of the LFG to ensure as much LFG is collected and destroyed as is technically feasible and for monitoring of the LFG collection and control system operations.

In addition to NMOC/HACs contained within the LFG, anaerobic decomposition of landfill refuse also generates sulfur compounds, principally hydrogen sulfide (H_2S), from sulfur containing material, such as sheetrock, that is placed in a landfill. The uncontrolled emissions for H_2S from the Landfill Operation are anticipated to exceed the AL for H_2S , and the Agency has determined that HMSER for H_2S emissions shall be the same as that for NMOC/HAC emissions, namely effective capture of the LFG and 98% destruction efficiency of NMOCs as a surrogate for evaluating H_2S destruction efficiency.

Formaldehyde is formed and emitted from the CAT 3520C engines at the LFGTE Operation as a result of incomplete combustion of LFG, and these formaldehyde emissions are anticipated to exceed the AL. Formaldehyde emissions from internal combustion engines are typically managed with catalytic treatment of the exhaust gas. However, combusted siloxanes in the exhaust will create silica deposits on any catalytic treatment system, rendering these treatment systems ineffective in short order. It is unclear at this time if the siloxane removal system proposed for treating the LFG before combustion in the engines will reduce siloxanes to a level that would enable effective use of a catalyst. The Agency has reviewed control technologies at several other landfills in the US that have installed catalytic treatment systems for the control of formaldehyde and CO emissions. However, these systems do not have sufficient long-term performance data to evaluate catalyst performance and/or longevity. The Agency will re-evaluate the use of a catalyst for formaldehyde control in the future when there is a better understanding of the long-term performance of oxidative catalysts on LFG-fired engines.

Accordingly, at this time, the Agency has determined that management of formaldehyde emissions will consist of effective management of engine combustion efficiency. Emissions of CO will be used as a surrogate to monitor engine combustion efficiency, and the CO limitations will be the same as the MSER limitations for CO emissions.

Silicon dioxide (SiO₂ or silica) is formed by combustion of siloxanes contained in the LFG. Based on the Agency's understanding of the siloxane content of the LFG at the Facility, the silica emissions from the Facility will exceed the AL for all forms of silica. CCEC has proposed to install a siloxane removal system to remove siloxanes from the LFG prior to combustion in the engines. Total PM emissions will be used as a surrogate for silica emissions. Accordingly, the Agency has determined that HMSER is a not to exceed 19.8 ton per year limit on total PM emissions from the Facility.

These HMSER evaluations shall be subject to re-evaluation five (5) years from the date of its determination and shall remain in effect until revised by the Agency. These and prior HMSER determinations for this Facility are presented below.

| Hazardous Most Stringent Emission Rate Determinations | | |
|--|---|---|
| Permit # | Pollutant | Description/Emission limit |
| Established under: #AP-92-020 Superseded below. | NMOCs including: benzene ethylene dichloride methylene chloride perchloroethylene trichloroethylene vinyl chloride | HMSER: 98% destruction of NMOCs achieved through the installation and operation of a properly designed LFG collection and control system. |
| Established under: #AOP-03-044 Re-established under: #AOP-06-060 Superseded below. | NMOCs including: acrylonitrile benzene chloroform 1,1,2-trichloroethane 1,1,2,2-tetrachloroethane ethylene dibromide ethylene dichloride hydrogen sulfide methylene chloride perchloroethylene propylene dichloride trichloroethylene vinyl chloride | HMSER: 98% destruction of NMOCs achieved through the installation and operation of a properly designed LFG collection and control system. Alternatively to demonstrating 98% destruction, the Facility may demonstrate that the outlet concentration of NMOCs from the combustion device does not exceed 20 ppmvd ¹ (as hexane equivalent) at 3% oxygen. |

| Hazardous Most Stringent Emission Rate Determinations | | |
|---|--|--|
| Permit # | Pollutant | Description/Emission limit |
| Established under: #AOP-15-032 | NMOCs including but not limited to: 1,2-Dichloroethane 1,2-Dichloropropane 1,1,1-trichloroethane 1,1,2-trichloroethane 1,1,2,2-tetrachloroethane acrylonitrile benzene bromodichloromethane chloroform ethyl mercaptan formaldehyde methylene chloride trichloroethylene vinyl chloride hydrogen sulfide (H ₂ S) Combustion byproducts: formaldehyde acetaldehyde silica (SiO ₂) | <u>HMSEER for NMOCs and H₂S:</u> 98% destruction of NMOCs achieved through the installation and operation of a properly designed LFG collection and control system. Alternatively to demonstrating 98% destruction, the Facility may demonstrate that the outlet concentration of NMOCs from the combustion device does not exceed 20 ppmvd ¹ (as hexane equivalent) at 3% oxygen. <u>HMSEER for Formaldehyde and Acetaldehyde:</u> Maintenance and operation of the CAT G3520C engines to maintain good combustion efficiency. CO emissions will be used as a surrogate for formaldehyde and acetaldehyde emissions as well as evidence of proper combustion of NMOC/HACs and H ₂ S. The CO limits for the CAT G3520C engines will be as follows: – 3.5 g/bhp-hr and 17.3 lb/hr (each) applies at all times. 3.1 g/bhp-hr and 15.3 lb/hr (each) must be demonstrated once every two years 2.75 g/bhp-hr and 13.5 lbs/hour (each) must be demonstrated once every 6 years. <u>HMSEER for silica:</u> Total PM emissions will be used as a surrogate for silica emissions. Total PM emissions will be limited to less than 19.8 tons per year from the Facility. |

¹ 20 ppmvd is parts per million by volume on a dry basis and is the alternative emission limit as provided in the federal regulations 40 *CFR* Part 60 §60.752 and Part 63 §63.1955.

As the Agency has determined that the Facility will have emissions of NMOCs, hydrogen sulfide, formaldehyde, acetaldehyde, and silica in excess of their respective Action Level, the Agency has considered whether or not an Air Quality Impact Evaluation should be required. The Agency has reviewed several factors relating to this Facility, including, but not limited to those listed in §5-261(3)(a)-(c) of the *Regulations* and the level of emissions typical for this category of emission source. Based on this review, the Agency is not requiring the Facility to conduct an air quality impact evaluation pursuant to §5-261(3) of the *Regulations* at this time.

Based on the Agency's review of the Facility's application and the above Findings of Fact, the Agency concludes that the Facility, subject to the following Permit conditions, complies with all applicable state and federal air pollution control laws and regulations. Therefore, pursuant to 10 VSA §§556 and 556a, as amended, the Agency hereby issues a Permit approving the Facility, as described in the above Findings of Fact, subject to the following:

PERMIT CONDITIONS

- Construction and Equipment Specifications -

- (1) The Permittee shall construct and operate the LFGTE Operation in accordance with the plans and specifications submitted to the Agency and in accordance with the conditions set forth herein, including the LFGTE Operation equipment specifications as listed in Findings of Fact (A) or their equivalent as approved by the Agency.

Construction and operation of the Landfill Operation as listed in Findings of Fact (A) is permitted separately under #AOP-14-034. [10 V.S.A. §§556(c) and 556a(d)] [§5-501(1) of the *Regulations*] [Applications for #AOP-03-044, AOP-06-060, and AOP-14-034/AOP-15-032]

- (2) Stack heights [CAT 32520C Engines]: The exhaust gases from each of the CAT 32520C engines shall be vented vertically through a stack or stacks which extend a minimum of twenty-eight (28) feet above the stack base grade elevation. The stacks shall not be equipped with any device that may obstruct the upward discharge of the exhaust gases such as a fixed rain cap of a type that has not been approved by the Agency.

The stack heights for each of the CAT 32520C engines shall be increased to a minimum height of thirty-four (34) feet above the stack base grade elevation by no later than December 31, 2016. [10 V.S.A. §§556(c) and 556a(d)] [§5-406 of the *Regulations*] [Application for #AOP-14-034]

- (3) Stack height [SRS Flare]: The exhaust gases from the enclosed flare at the SRS shall be vented vertically through a stack which extends a minimum of twenty-four (24) feet above the stack base grade elevation. In the event the John Zink or Parnel LFG flare is used instead, that stack shall extend a minimum of thirty-five (35) feet above the stack base grade elevation.

The stack shall not be equipped with any device that may obstruct the upward discharge of the exhaust gases such as a fixed rain cap of a type that has not been approved by the Agency. [10 V.S.A. §§556(c) and 556a(d)] [§5-406 of the *Regulations*] [Application for #AOP-14-034]

- Operational Limitations -

- (4) Sulfur Content in Fuel – No. 2 Distillate Fuel: Only No.2 distillate fuel, or lighter grade fuel oils, with a maximum sulfur content not to exceed 0.05 percent by weight may be used as fuel in the emergency generator at the LFGTE Operation unless the Permittee obtains prior written approval from the Agency to use another type of fuel.

Commencing on July 1, 2018, the sulfur content of No.2 and lighter distillate oils shall not exceed 0.0015 percent by weight. [10 V.S.A. §§556(c) and 556a(d)] [§§5-501 and 5-1015(a)(1) of the Regulations] [§5-221(1)(a) of the Regulations] [Application for #AOP-14-034]

- (5) Stationary Internal Combustion Engines: The CAT 3520C engines at the LFGTE Operation subject to 40 CFR Part 60 Subpart JJJJ and/or 40 CFR Part 63 Subpart ZZZZ may only be fired using landfill or digester gas unless the Permittee obtains prior written approval from the Agency to use another type of fuel. [10 V.S.A. §§556(c) and 556a(d)] [§§5-501 and 5-1015(a)(1) of the Regulations] [§5-221(1)(a) of the Regulations] [40 CFR Part 63 Subpart ZZZZ] [40 CFR Part 60 Subpart JJJJ] [Application for #AOP-14-034]
- (6) The Permittee shall maintain the exhaust temperature of each operating CAT 3520C engine at or above 800°F during engine operation, except during startup and shutdown. Each engine shall be equipped and operated with a continuous temperature monitoring system (CTMS) in accordance with the requirements below, or their equivalent as approved by the Agency, to continuously measure and permanently record exhaust temperature downstream of the two turbochargers on each engine during periods of engine operation. The CTMS shall also be installed, calibrated, operated, and maintained in accordance with the manufacturer's recommendations and shall be kept in good working order as specified below: Continuous measurement shall be defined as one measurement per hour at each data collection point.
- (a) The CTMS shall be installed following manufacturer's guidelines and shall be placed in a location that provides representative measurements of the engine exhaust temperature and is free from any interference which may affect the accuracy of the measurement and is easily accessible for maintenance.
 - (b) The CTMS shall have a measurement range appropriate to provide measurements of engine exhaust temperature during all engine operating scenarios and load levels. The CTMS must have a minimum measurement accuracy of +/-2% of full scale and permanently record the engine exhaust temperature using a digital data acquisition system or calibrated analog strip chart recorder.
 - (c) The CTMS must be operational at all times, continuously recording valid results without substantial interruption during all periods of engine operation including periods of startup, shutdown, and malfunction or emergency conditions; except for periods of CTMS calibration, quality assurance testing, routine maintenance or uncontrolled malfunction.
 - (d) Following written procedures acceptable to the Agency, the Permittee shall calibrate the CTMS measurement components and permanent data-recording devices annually in a manner consistent with the manufacturer's guidelines or whenever necessary to ensure the system is operating within the manufacturer's guidelines and this Permit Condition.

- (e) The Permittee shall maintain records of all valid and invalid CTMS measurements, calibrations, QA/QC, maintenance, malfunction, corrective action and downtime associated with the respective CTMS in a permanent form suitable for inspection for a period of 5 years following the date of the record. Where applicable, all data records for the system shall be marked to show the times of both start-up and shutdown of the engine.
- (f) The Permittee shall document any three (3) hour average exhaust temperature record that falls below the compliance temperature for each respective engine. Following any three (3) hour period in which the temperature falls below the compliance temperature, The Permittee shall immediately perform an inspection of the applicable systems and take expeditious and appropriate corrective actions to minimize the period during which the source is operating outside the established limit. All corrective actions will be documented following condition (e) above.

[10 V.S.A. §§556(c) and 556a(d)] [§§5-405(1) and 5-1015(a) (3) and (4) of the *Regulations*] [40 CFR Part 64]

- (7) The flare used for the SRS shall be operated with a flame present at all times LFG is routed through the flare. In addition, the flares shall be equipped with a windscreen to prevent flame out if necessary. [10 V.S.A. §§556(c) and 556a(d)] [§5-261(2) of the *Regulations*] [40 CFR Part 60 Subpart A §60.18(c)(2)]
- (8) The flare used for the SRS shall be equipped with a heat sensing device, or the equivalent as approved by the Agency, such as an ultraviolet beam sensor or thermocouple, at the pilot light or the flame itself to indicate the continuous presence of a flame when LFG is being delivered to the respective flare. The device shall be installed, calibrated, maintained and operated in accordance with the manufacturer's specifications. In the event the heat sensing device detects a flame failure the gas flow to the flare shall be automatically shut down until the flame is reestablished. [10 V.S.A. §§556(c) and 556a(d)] [§5-261(2) of the *Regulations*] [40 CFR Part 60 Subpart A §60.18(f)(2)] [40 CFR Part 64]
- (9) Generators/Engines: The Permittee shall not install or operate a stationary reciprocating internal combustion engine, as defined in the *Regulations*, unless the engine complies with §5-271 of the *Regulations* as may be applicable as well as any federal regulations including NSPS Subpart IIII and JJJJ and NESHAP ZZZZ, as may be applicable. All engines, including emergency generators/engines, installed on or after July 1, 2007 must comply with the applicable emission standards (Tier 2) of §5-271 immediately upon installation. Installation of any size engine, even those below 450 bhp, may still require approval from the Agency in the form of an amended permit prior to installation. Stationary reciprocating internal combustion engines include those used to power electric generator sets or to provide shaft power for other equipment such as compressors but does not include engines used to power motor vehicles. [§§5-271 and 5-501 of the *Regulations*] [40 CFR Part 60 Subpart IIII and Part 63 Subpart ZZZZ]

(10) Emergency Generators/Engines: Stationary emergency generators/engines, including those specified as such in Finding of Fact (A), shall be used only for emergency purposes and up to 100 hours per year for routine testing and maintenance. Emergency purposes are limited to periods of time when:

- (a) The usual source of power, heat or lighting is temporarily unavailable due to reasons beyond the reasonable control of the owner/operator;
- (b) The Independent System Operator has determined a power capacity deficiency exists and has implemented a voltage reduction of five (5) percent or more of normal operating voltage; or
- (c) A fire or flood makes it necessary to pump water to minimize property damage.

In the event the Permittee must take action to restore the normal power source, the Permittee must take such action in a reasonable period of time. Emergency engines shall not be operated as part of any other ISO or utility peaking or load shedding activities without the approval of the Agency. The definition of emergency use for applicability to federal regulations NSPS Subpart IIII and NESHAP Subpart ZZZZ may be different and the Permittee should consult those regulations directly for applicability to those respective regulations. [10 V.S.A. §§556(c) and 556a(d)] [§§5-401(6)(c) and 5-501 of the *Regulations*]

(11) Solvent Metal Cleaning [Parts Cleaner]: The Permittee shall operate the cold, solvent metal cleaning unit (parts cleaner) in accordance with the following requirements and shall only use a solvent with a vapor pressure equal to or less than 0.3 pounds per square inch measured at 100°F, which includes but is not limited to the Safety-Kleen 105 hydrocarbon solvent. Prior to the Permittee using any solvent with a maximum true vapor pressure greater than 0.3 psi or using a solvent that is heated, the Permittee shall notify the Agency and comply with any additional applicable requirements of §5-253.14 of the *Regulations*.

- (a) Provide a permanent, legible, conspicuous label, summarizing the operating requirements;
- (b) Store waste solvent in covered containers;
- (c) Close the cover whenever parts are not being handled in the cleaner;
- (d) Drain the cleaned parts until dripping ceases;
- (e) Supply a solvent spray, if used, that ensures a solid fluid stream at a pressure that does not exceed ten (10) pounds per square inch gauge;
- (f) Degrease only materials that are neither porous nor absorbent; and
- (g) Cease operation of the unit upon the detection of any visible solvent leak until such solvent leak is repaired.

[10 V.S.A. §§556(c) and 556a(d)] [§5-253.14 of the *Regulations*]

(12) Open Burning: Open burning is prohibited except as provided for in §5-202 of the *Regulations*. Prior to conducting open burning of any material, other than leaves, brush, or tree cuttings from normal grounds maintenance, the Permittee shall contact the Air Pollution Control Officer and obtain approval for such burning, if required. [§5-202 of the *Regulations*]

- Emission Limitations -

- (13) SRS Flare: Emissions of the following pollutants from the SRS flare operated as part of the SRS shall not exceed the following limits:

| Pollutant Emission Limitations | | |
|---------------------------------------|---|-----------------------|
| Pollutant | SRS Flare: 5.5 MMBtu/hr | |
| | lbs/MMBtu ¹ | lbs/hour ² |
| Carbon monoxide (CO) | 0.37 | 2.0 |
| Nitrogen oxides (as NO ₂) | 0.068 | 0.37 |
| Nonmethane organic compounds (NMOCs) | 98% destruction efficiency or 20 ppmvd ³ as hexane@3% O ₂ outlet concentration | |

¹ lbs/MMBTU equals pounds of pollutant emitted per million British Thermal Units of heat input.

² lbs/hour equals pounds of pollutant emitted per hour based on the stated heat input rating for each flare, LFG containing 50% methane and the nominal rated capacity of the flare is approximately 183 scfm.

³ ppmvd equals parts per million by volume on a dry basis corrected to three (3) % oxygen.

Any emission testing conducted to demonstrate compliance with the above emission limit shall be performed in accordance with 40 *CFR* Part 60, Appendix A, Reference Method 10 for CO and Method 7E for NO_x or an alternative method which has been published in 40 *CFR*, provided the federally approved alternative method has been accepted in writing by the Agency before testing. Open utility flares typically are not subject to stack emission testing due to the inherent limitations in the design of such flares and instead are required to comply with the visible emissions and gas velocity design criteria of 40 *CFR* Part 60.18. [10 V.S.A. §§556(c) and 556a(d)] [§S5-404 and 5-502(3) of the *Regulations*] [Application for #AOP-14-034]

- (14) CAT G3520C Engines: Emissions of the following pollutants from each CAT G3520C engine shall not exceed the following limits:

| Pollutant Emission Limitations | | |
|--|--|---|
| CAT Model G3520C (2,221 bhp) Engine Generators | Emission Limitations (each engine) | |
| | g/bhphr ¹ (unless otherwise noted) | lbs/hr ² (each) |
| Carbon monoxide (CO) | 3.5 (applies at all times) | 17.3 (applies at all times) |
| | 3.1 (must be demonstrated once every two years) | 15.3 (must be demonstrated once every two years) |
| | 2.75 (must be demonstrated every 6 years) | 13.5 (must be demonstrated every 6 years) |
| Nitrogen oxides (as NO ₂) | 0.5 | 2.45 |
| Nonmethane organic compounds (NMOCs) | 98% destruction efficiency or 20 ppmvd ³ as hexane@3% O ₂ outlet concentration | Not Applicable |
| Particulate matter including condensable and filterable ⁴ | 0.15 | 0.74 |

¹ g/bhphr equals grams of pollutant emitted per brake horsepower hour.

² lbs/hour equals pounds of pollutant emitted per hour based on full capacity of the engines (507 scfm each for a total of 2,535 scfm for all 5 engines).

³ ppmvd equals parts per million by volume on a dry basis corrected to three (3) % oxygen.

⁴ Application for #AOP-14-034

Any emission testing conducted to demonstrate compliance with the above emission limits shall be performed at the rated load and speed of the engine and in accordance with 40 CFR Part 60, Appendix A, Reference Method 10 for CO, Method 7E for NO_x, and Method 25C or Method 18 for NMOC destruction efficiency and NMOC outlet concentration and Method 5 and 202 for PM, or alternative methods which have been published in 40 CFR, provided the federally approved alternative method has been accepted in writing by the Agency before testing. [10 V.S.A. §§556(c) and 556a(d)] [§§5-271(b), 5-404 and 5-502(3) of the Regulations] [Application for #AOP-03-044] [Application for #AOP-14-034]

- (15) VOC Emissions - CAT G3520C - Engine No. 5: For compliance with the emissions limitations of 40 *CFR*, Part 60 Subpart JJJJ, emissions of VOCs from Engine No. 5 shall not exceed 1.0 g/bhp-hr, excluding emissions of formaldehyde.

Any emission testing conducted to demonstrate compliance with the above emission limit shall be performed at the rated load and speed of the engine and in accordance with 40 *CFR* Part 63 Subpart JJJJ which specifies, 40 *CFR* Part 60, Appendix A, Reference Methods 25A and 18, or Method 25A with a methane cutter and either Method 18 or 40 *CFR* Part 63, Appendix A, Reference Method 320, or ASTM Method D6348-03. CCEC may use alternative methods which have been published in 40 *CFR*, provided the federally approved alternative method has been accepted in writing by the Agency before testing. [10 V.S.A. §§556(c) and 556a(d)] [§§5-271(b), 5-404 and 5-502(3) of the *Regulations*] [40 *CFR* Part 63, Subpart JJJJ] [Application for #AOP-06-060]

- (16) Control of Facility SO₂ Emissions: Emissions of SO₂ from the Facility shall not equal or exceed 40 tons per rolling 12-month period.

The quantity of SO₂ emissions from the Facility shall be determined on a monthly basis in accordance with the following formula

$$\text{SO}_2 \text{ total} = \text{LFG}_{\text{month}} * \text{Concentration}_{\text{H}_2\text{S}} * 1.694\text{E-}7 \text{ lb SO}_2/\text{ppmv H}_2\text{S -scf LFG}$$

Where:

$\text{LFG}_{\text{month}}$ = The total collected LFG flow in scf delivered to all combustion devices at the Facility in that month

$\text{Concentration}_{\text{H}_2\text{S}}$ = Measured H₂S concentration in LFG in parts per million by volume for that month.

Compliance with this limit shall be documented through measuring and recording monthly LFG flow in standard cubic feet per minute (scfm) and H₂S concentration in parts per million by volume. Concentrations of H₂S may be measured using colorimetric tubes, electronic gas detection meters, or chemical analysis. One LFG sample shall be collected and analyzed annually for H₂S in a fixed-base chemical analytical laboratory to provide confirmation of H₂S concentrations measured using colorimetric tubes, electronic gas detection meters, or other field measurement methods. An alternative methodology for calculating SO₂ emissions may be used if approved in writing by the Agency. [10 V.S.A. §§556(c) and 556a(d)]

- (17) Control of Facility PM Emissions: Commencing with emissions from the month of January 2017 forward, emissions of total PM from the Facility shall not equal or exceed 19.8 tons per rolling 12-month period. Monthly PM emissions shall be calculated in accordance with the following formulae:

$$\text{Equation 1: } PM_{\text{total}} = PM_{\text{siloxane removal system}} + PM_{\text{LFG flares}} + PM_{\text{engine combustion}}$$

$$\text{Equation 2: } PM_{\text{siloxane removal system}} = [\text{Si Concentration}_{\text{srs inlet}} - \text{Si Concentration}_{\text{srs outlet}}] * [1 \text{ cubic meter}/35.31 \text{ cubic feet}] * [1 \text{ lb}/453,592 \text{ mg}] * [\text{LFG}_{\text{treated}}] * [\text{Molecular weight of SiO}_2 / \text{Molecular weight of Si}] * [1 \text{ ton}/2,000 \text{ lb}] + ([\text{LFG}_{\text{srs}}] * [\text{LFG Heat Value}] * [\text{Flare Emission Factor}] * [1 \text{ ton}/2,000 \text{ lb}])$$

Where:

$\text{LFG}_{\text{treated}}$ = Total collected LFG flow in scf treated by the SRS at the Facility in that month

$\text{Si Concentration}_{\text{srs inlet}}$ = Si concentration in LFG before treatment by the SRS in mg Si / cubic meter

$\text{Si Concentration}_{\text{srs outlet}}$ = Si concentration in LFG after treatment in SRS in mg Si / cubic meter

LFG_{srs} = Total LFG flow in scf used to fire the SRS flare in that month

LFG Heat Value = Heat Value of LFG in MMBtu/scf. A default value of 5.0E-4 MMBtu/scf may be used or a site specific value approved by the Agency.

$\text{Flare Emission Factor}$ = 1.7E-2 lb/MMBtu

$$\text{Equation 3: } PM_{\text{LFG flares}} = ([\text{LFG}_{\text{month flares}}] * [\text{LFG Heat Value}] * [\text{Flare Emission Factor}] * [1 \text{ ton}/2,000 \text{ lb}]) + ([\text{LFG}_{\text{month flares}}] * [\text{Si Concentration}_{\text{flares}}] * [1 \text{ cubic meter}/35.31 \text{ cubic feet}] * [1 \text{ lb}/453,592 \text{ mg}] * [\text{Molecular weight of SiO}_2 / \text{Molecular weight of Si}] * [1 \text{ ton}/2,000 \text{ lb}])$$

Where:

$\text{LFG}_{\text{month flares}}$ = Total collected LFG flow in scf delivered to the flare(s), excluding the SRS flare addressed in equation 2 above, at the Facility in that month

LFG Heat Value = Heat Value of LFG in MMBtu/scf. A default value of 5.0E-4 MMBtu/scf may be used or a site specific value approved by the Agency.

$\text{Flare Emission Factor}$ = 1.7E-2 lb/MMBtu

$\text{Si Concentration}_{\text{flares}}$ = Si concentration in LFG to flare(s) in mg Si / cubic meter

$\text{Molecular weight of Si}$ = 28.09

$\text{Molecular weight of SiO}_2$ = 60.08

$$\text{Equation 4: } PM_{\text{engine combustion}} = [\text{Engine Emission Factor}] * [1 \text{ lb}/453,592 \text{ g}] * [\text{Hours of operation for 3520C engines}] * [3520C \text{ engine rating}] * [\text{Capacity Factor}] * [1 \text{ ton}/2,000 \text{ lb}]$$

Where:

$\text{Engine Emission Factor}$ = 0.153 g/bhp-hr OR emission factor in g/bhp-hr obtained from stack testing required by Condition (27) of this Permit at the Agency's discretion.

$\text{Hours of operation for 3520C engines}$ = Total number of hours of operation for all 3520C engines in that month.

$3520C \text{ engine rating}$ = 2,221 bhp or a site specific value approved by the Agency.

Capacity Factor = Measured electrical output in MW of all 3520C engines at the Facility in that month / Electrical Output_{theoretical}

Electrical Output_{theoretical} = Electrical output in MW of all 3520C engines at the Facility in that month assuming they are operated at 100 percent output for the hours operated..

Compliance with this limit shall be documented through measuring and recording:

- Monthly LFG flow treated by the SRS in standard cubic feet (scf).
- Monthly LFG flow to the CAT 3520C engines in standard cubic feet (scf)
- Monthly LFG flow to each of the flare(s) in standard cubic feet (scf)
- Silicon (Si) concentrations in untreated LFG in units of milligrams of Si per cubic meter of LFG measured every six (6) months.
- Silicon (Si) concentrations of LFG after treatment in the SRS in units of milligrams of Si per cubic meter of LFG.
- Monthly hours of operation for the five (5) 3520C engines at the Facility recorded to the nearest tenth (0.1) hour.

Concentrations of Si shall be measured before and after treatment in the siloxane removal system, and shall be measured every six (6) months using sample collection and chemical analytical methods approved by the Agency. Sampling and analysis of untreated LFG for Si shall commence within 90 days of permit issuance, and sampling and analysis of LFG treated by the SRS for Si shall be 90 days after completion of SRS installation. [10 V.S.A. §§556(c) and 556a(d)]

- (18) Control of Facility VOC Emissions: Emissions of VOCs from the Facility shall not equal or exceed 50 tons per rolling 12-month period.

The quantity of VOC emissions from the Facility shall be determined on a monthly basis in accordance with the following formulae:

$$\text{Equation 1: } \text{VOC}_{\text{total}} = \text{VOC}_{\text{fugitive}} + \text{VOC}_{\text{flares}} + \text{VOC}_{\text{engine combustion}}$$

$$\text{Equation 2: } \text{LFG}_{\text{fugitive}} = [\text{LFG}_{\text{month}} / \text{Percent Capture Efficiency}] * [1 - \text{Percent Capture Efficiency}]$$

$$\text{Equation 3: } \text{VOC}_{\text{fugitive}} = [\text{LFG}_{\text{fugitive}}] * [4.99\text{E-}5 \text{ lb VOC/scf LFG}] * [1 \text{ ton}/2,000 \text{ pounds}]$$

Where:

$\text{LFG}_{\text{month}}$ = The total collected LFG flow in scf delivered to all combustion devices at the Facility in that month

$\text{LFG}_{\text{fugitive}}$ = The total fugitive LFG emitted from the Facility in that month

Percent Capture Efficiency = 0.85

Percent Fugitive Emissions = [1 - Percent Capture Efficiency]

Percent capture efficiency is expressed as a decimal equivalent (i.e. 85% = 0.85)

$$\text{Equation 4: } \text{VOC}_{\text{flares}} = [\text{LFG flow in scf delivered to flares}] * [4.99\text{E-}5 \text{ lb VOC/scf LFG}] * [1 - \text{Destruction Efficiency}] * [1 \text{ ton}/2,000 \text{ pounds}]$$

Where:

Destruction Efficiency = 0.98

Percent destruction efficiency is expressed as a decimal equivalent (i.e. 98% = 0.98)

Equation 5: $\text{VOC}_{\text{engine combustion}} = [\text{Total Engine Operating Hours} * \text{Engine Horsepower}] * [\text{Capacity Factor}] * [\text{VOC Emission Factor}] * [1 \text{ lb}/453.59 \text{ g}] * [1 \text{ ton}/2,000 \text{ pounds}]$

Where:

Total Engine Operating Hours = The total operating hours for all 3520C engines at the Facility in that month.

Engine Horsepower = Rated output of a 3520C engine, or 2,221 bhp

Capacity Factor = Measured electrical output in MW of all 3520C engines at the Facility in that month / Electrical Output_{theoretical}

Electrical Output_{theoretical} = Electrical output in MW of all 3520C engines at the Facility in that month assuming they are operated at 100 percent output for the hours operated..

VOC Emission Factor = 39 percent of the measured NMOC emission factor from the most recent annual engine emissions testing in accordance with Condition (25) in grams per brake horsepower-hour plus the AP-42 formaldehyde emission factor for natural-gas fired engines of 0.164 grams per bhp-hr.

OR, at the Agency's discretion,

VOC Emission Factor = Measured emission factor obtained from stack testing performed under Condition (26) of this Permit. Testing under Condition (26) will include a speciated analysis for VOC compounds.

Monthly VOC emissions from the Facility shall be summed for a rolling 12-month period and evaluated to ensure they are less than 50 tons per year. Compliance with this limit shall be documented through measuring and recording total monthly LFG flow in standard cubic feet (scf), monthly LFG flow in scf to the flares, the total monthly engine operating hours for all 3520C engines at the Facility, and the measured electrical output produced by the 3520C engines at the Facility. [10 V.S.A. §§556(c) and 556a(d)]

- (19) Particulate Matter: Emissions of particulate matter ("PM") from any fossil fuel burning device, except motorized vehicles, with a heat input rating of less than ten (10) million British Thermal Units per hour ("MMBTU/hr") shall not exceed 0.5 pounds per MMBtu.

Any emission testing conducted to demonstrate compliance with the above emission limit shall be performed in accordance with 40 *CFR* Part 60, Appendix A, Reference Method 5 and 202 or an alternative method which has been published in 40 *CFR*, provided the federally approved alternative method has been accepted in writing by the Agency before testing. [§§5-231(3)(a)(i) and 5-404 of the *Regulations*]

- (20) Visible Emissions [LFGTE Operation]: Emissions of visible air contaminants from any installation at the LFGTE Operation, except where otherwise noted in this Permit, shall not exceed twenty (20) percent opacity for more than a period or periods aggregating six (6) minutes in any hour and at no time shall visible emissions exceed sixty (60) percent opacity.

Any emission testing conducted to demonstrate compliance with the above emission limits shall be performed in accordance with 40 *CFR* Part 51, Appendix M, Methods 203B and 203C, respectively, or equivalent methods approved in writing by the Agency. [§§5-211(2), 5-211(3) and 5-404 of the *Regulations*]

- (21) Visible Emissions [LFGTE Operation – CAT 3520C Engines and SRS Flare]: Emissions of visible air contaminants from any installation at the LFGTE Operation, except for the SRS flare and where otherwise noted in this Permit, shall not exceed twenty (20) percent opacity for more than a period or periods aggregating six (6) minutes in any hour and at no time shall visible emissions exceed sixty (60) percent opacity. The SRS flare shall be operated with no visible emissions in accordance with 40 *CFR* §60.18(c)(1). [10 V.S.A. §§556(c) and 556a(d)] [§5-261(2) of the *Regulations*] [40 *CFR* Part 60 Subpart A §60.18(c)(1)]

- (22) Hazardous Air Contaminants: Emissions of state hazardous air contaminants (HACs) from the applicable operations at the Facility shall not equal or exceed their respective Action Level (found in Appendix C of the *Regulations*) unless the Agency has reviewed and approved such HAC emission under §5-261(2) of the *Regulations*. [§5-261 of the *Regulations*]

- (23) Fugitive Particulate Matter Emissions: The Permittee shall take reasonable precautions at all times to control and minimize emissions of fugitive particulate matter from the operations at the Facility. [10 V.S.A. §§556(c) and 556a(d)] [§5-231(4) of the *Regulations*]

- (24) Nuisance and Odor: The Permittee shall not discharge, cause, suffer, allow, or permit from any activity at the LFGTE Operation whatsoever such quantities of air contaminants or other material which will cause injury, detriment, nuisance or annoyance to any considerable number of people or to the public or which endangers the comfort, repose, health or safety of any such persons or the public or which causes or has a natural tendency to cause injury or damage to business or property. The Permittee shall not discharge, cause, suffer, allow, or permit any emissions of objectionable odors beyond the property line of the premises. [§5-241(1) and (2) of the *Regulations*]

- Compliance Testing and Monitoring -

(25) Annual Emissions Testing – CAT 3520C Engines: CCEC shall perform emission testing on the CAT G3520C engines in accordance with the following schedule and shall furnish the Agency with a written report of the results within sixty (60) days of performing the test(s):

- (a) In accordance with the requirements of 40 CFR Part 60 Subpart JJJJ, engine No. 5 shall be tested every 8,760 hours of operation or every 3 years, whichever comes first, to demonstrate compliance with the carbon monoxide (CO), nitrogen oxides (NO_x) and nonmethane organic compound (NMOC) emission limitation(s) specified in Condition (14) of this Permit, and the VOC emission limitations contained in Condition (15) of this Permit.

For Engines No. 1 – No 4

Each engine of Engine No. 1 through No. 4 shall be tested once every two years. No individual engine from No. 1 through No. 4 shall be tested in consecutive years. These engines shall be tested within the calendar year, and the written report of the emissions testing shall be provided to the Agency by the end of that calendar year.

For example

- (b) Even numbered engines may be tested on years ending in even numbers.
(c) Odd number engines maybe tested on years ending in odd numbers

The emission testing shall be performed in order to demonstrate compliance with the carbon monoxide (CO), nitrogen oxides (NO_x) and nonmethane organic compound (NMOC) emission limitation(s) specified in Condition (14) of this Permit. At least thirty (30) days prior to performing the emission testing required above, CCEC shall submit to the Agency a pretest report prepared in accordance with the Agency's "Source Emission Testing Guidelines". [§§5-402(1), 5-404(1) and 5-405(1) of the *Regulations*] [40 CFR Part 64]

(26) VOC Emissions Testing – 3520C Engines: CCEC shall perform emissions testing on any two of the CAT G3520C engines for VOCs including, but not limited to formaldehyde and acetaldehyde, and shall provide a written report of the results no later than 12/31/2016. The emission testing shall be performed in order to establish one of the VOC emission factors specified in Condition (18) of this Permit.

At least thirty (30) days prior to performing the emission testing required above, CCEC shall submit to the Agency a pretest report prepared in accordance with the Agency's "Source Emission Testing Guidelines". [§§5-402(1), 5-404(1) and 5-405(1) of the *Regulations*]

- (27) Particulate Matter Emissions Testing –3520C Engines: CCEC shall perform emissions testing on any two of the CAT G3520C engines for total particulate matter and shall provide a written report of the results no later than 12/31/2016 for one engine and no later than 90 days following installation of the SRS system for the second engine. The emission testing shall be performed in order to demonstrate compliance with the particulate matter emission limitation specified in Condition (14) of this Permit, and to characterize the particulate emissions from the 3520C engines for use in estimating annual PM emissions in accordance with Condition (17) of this Permit. Testing to characterize the particulate emissions shall include, but not be limited to particle size distributions and particle composition.

At least thirty (30) days prior to performing the emission testing required above, CCEC shall submit to the Agency a pretest report prepared in accordance with the Agency's "Source Emission Testing Guidelines". [§§5-402(1), 5-404(1) and 5-405(1) of the *Regulations*] §5-261 of the *Regulations*]

- (28) Startups, Shutdowns and Malfunctions (SSM) Plan – LFGTE Operation: The Permittee shall develop and implement a written startup, shutdown and malfunction (SSM) Plan in accordance with 40 CFR Part 63 Subpart A §63.6(e)(3). The SSM Plan shall be developed and submitted to the Agency within ninety (90) days of Permit issuance.

The Permittee shall submit a semi-annual SSM report to the Agency that details all actions taken during periods of startup, shutdown and malfunctions. The Permittee shall also report all actions taken during periods of startup, shutdown and malfunctions that are not consistent with the SSM Plan within two (2) working days of such action followed by a written letter to the Agency within seven (7) day of such action. [10 V.S.A. §§556(c) and 556a(d)] [40 CFR Part 63 Subpart A §63.6(e)(3)]

- (29) Operation and Maintenance Plan [Siloxane Removal System]: The Permittee shall develop and implement an operation and maintenance plan (O&M Plan) for the siloxane removal system (SRS) within thirty (30) days following commencement of operation of the SRS. The purpose of said O&M Plan shall be to ensure optimum performance and the proper operation and maintenance of the SRS in order to ensure continuous compliance with the respective conditions and emission limits of this Permit. The O&M Plan shall include, but not be limited to:
- (a) A description of routine maintenance and inspection procedures for the siloxane removal unit and the associated flare, including, but not limited to, the frequency of sorption bed regeneration and the anticipated frequency of sorption bed media replacement;
 - (b) Provisions for maintaining records of such maintenance and inspections as well as the findings of those inspections and any corrective actions which were taken; and
 - (c) The design and site-specific installation of the siloxane removal system, as well as a description of the sampling and analytical methods used to measure silicon concentrations in LFG at the inlet and outlet of the removal system.

Said O&M Plan shall be present at the Facility at all times and shall be made available to representatives of the Agency upon request. The Permittee shall revise said O&M Plan at the Agency's request or on its own motion based on operating experience or to reflect equipment or operational changes. [§5-405 of the Regulations]

- Record Keeping and Reporting -

- (30) Records of CAT 3520C Engines and SRS Flare Operation: CCEC shall maintain records of the operating status of each CAT 3520C engine and the SRS flare for all periods of operation and shall include the level of operation such as the hours of operation for the engines, kilowatts of power produced by the engines and the quantity of LFG, in standard cubic feet or Btu per hour, delivered to the engines and flares. [10 V.S.A. §§556(c) and 556a(d)] [§§5-405(1) and 5-1015(a)(3) and (4) of the Regulations]
- (31) Records of Engine Exhaust Temperature: CCEC shall maintain records of the exhaust temperature of each CAT 3520C engine while in operation. [10 V.S.A. §§556(c) and 556a(d)] [§§5-405(1) and 5-1015(a)(3) and (4) of the Regulations] [40 CFR Part 64]
- (32) Records of Engine and SRS Flare Inspections and Maintenance: The Permittee shall maintain records of all maintenance and repairs completed on the CAT 3520C engines and the SRS flare. [10 V.S.A. §§556(c) and 556a(d)] [§§5-405(1) and 5-1015(a)(3) and (4) of the Regulations]
- (33) Records of Distillate No. 2 Fuel Use: The Permittee shall maintain records of the total quantity of distillate No. 2 fuel oil consumed in stationary combustion equipment at the LFGTE Operation, in gallons, each calendar year. [10 V.S.A. §§556(c) and 556a(d)] [§§5-405(1) and 5-1015(a)(3) and (4) of the Regulations]

- (34) Records of Fuel Oil Certifications [No. 2 Distillate Oil]: The Permittee shall obtain from the fuel supplier, for each shipment of fuel oil received at the Facility for use in stationary combustion equipment a certification or invoice regarding the sulfur content of the fuel oil. The certification or invoice shall include: the date of delivery, name of the fuel oil supplier, fuel type, quantity of fuel oil delivered, the sulfur content of the fuel delivered, and the location of the oil when the sample was drawn for analysis to determine the sulfur content of the oil, specifically including whether the oil was sampled as delivered to the affected facility, or whether the sample was drawn from oil in storage at the oil supplier's or oil refiner's facility, or other location, and the method used to determine the sulfur content of the oil. [10 V.S.A. §§556(c) and 556a(d)] [§5-405(1) of the *Regulations*]
- (35) Records of LFG flow and H₂S Measurements: The Permittee shall maintain records of LFG flow measurements and associated H₂S concentration measurements used to demonstrate compliance with the requirements of Condition (16) of this permit. [10 V.S.A. §§556(c) and 556a(d)] [§§5-405(1) and 5-1015(a)(3) and (4) of the *Regulations*]
- (36) Records of LFG flow and Si Concentration Measurements: The Permittee shall maintain records of LFG flow measurements and associated Si concentration measurements used to demonstrate compliance with the requirements of Condition (17) of this permit. [10 V.S.A. §§556(c) and 556a(d)] [§§5-405(1) and 5-1015(a)(3) and (4) of the *Regulations*]
- (37) Records: Records of all required compliance testing shall include the following:
- (a) the date, place, and time of sampling or measurements;
 - (b) the date analyses were performed;
 - (c) the company or entity that performed the analyses;
 - (d) the analytical techniques or methods used;
 - (e) the results of all such analyses; and
 - (f) the operating conditions existing at the time of sampling or measurement.
- [§§5-402, 5-405(1) and 5-1015(5) of the *Regulations*] [40 CFR Part 70.6(a)(3)(ii)(A)]
- (38) Records: All records shall be retained for a minimum period of five (5) years from the date of record and shall be made available to the Agency upon request. [§§5-402, 5-405(1) and 5-1015(a)(7) of the *Regulations*] 40 CFR Part 70.6(a)(3)(ii)(B)]
- (39) Notification: The Permittee shall notify the Agency in writing within ten (10) days of any violation, of which it is aware, of any requirements of this Permit. This notification shall include, at a minimum, the cause for the violation and corrective action or preventative maintenance taken to correct the violation. [§§5-402 and 5-1015(a)(6) of the *Regulations*]

- (40) **Notification:** The Permittee shall notify the Agency in writing of any proposed physical or operational change at the Facility which may increase the emission rate of any air contaminant to the ambient air regardless of any concurrent emission reductions that may be achieved. This notification requirement includes, but is not limited to, the proposed installation of any new equipment that is a source of air pollution, including the replacement of an existing permitted air pollution source. If the Agency determines that a permit amendment is required, a new application and the appropriate application fee shall be submitted. The permit amendment shall be obtained prior to commencing any such change except as may otherwise be allowed by the *Regulations*. [10 V.S.A. §556(c)] [§§5-402 and 5-501 of the *Regulations*]
- (41) **Reporting: Semi-Annual Periodic Monitoring Reports:** The Permittee shall submit semi-annual reports to the Agency postmarked by the 30th day following the end of each reporting period. The reporting periods shall cover operations from January 1st through June 30th and July 1st through December 31st. The semi-annual reports shall be signed by a responsible official of CCEC and contain the following information regarding the preceding six (6) month reporting period:
- (a) description and duration of all periods when the gas stream is diverted from the controls devices;
 - (b) all periods when the collection system was not operating in excess of 5 days;
 - (c) a summary of the LFGTE Operation surface monitoring results including the location and concentration of each exceedance of the 500 ppm methane surface monitoring threshold;
 - (d) the date and location of each new gas collection well added to the system;
 - (e) a summary of the gas collection system well head inspections and vertical gas well extraction point monitoring results;
 - (f) a summary of the operating status of the engines and flares;
 - (g) a summary of all periods engine exhaust temperature during operation fell below the allowed level;
 - (h) a summary of inspections and maintenance on the engines and flares;
 - (i) a summary of the fuel usage records required by this Permit;
 - (j) a statement of the sulfur content of any distillate fuel delivered to the Facility; and
 - (k) a summary of any and all used oil analyses performed.

[§§5-402, 5-405(1) and 5-1015(a)(5) of the *Regulations*][40 CFR Part 70 §70.6(a)(3)(iii)(A)]

- (42) Reporting: Annual Compliance Certification: By February 1st of each year, the Permittee shall submit to the Agency and the U.S. EPA an annual certification of compliance for the previous calendar year which ascertains and identifies the compliance status of the Facility with respect to all terms and conditions of this Permit, including but not limited to the following:
- (a) Identification of each term or condition of the permit that is the basis of the certification;
 - (b) The compliance status;
 - (c) Whether compliance was continuous or intermittent; and
 - (d) The methods used for determining the compliance status of the Facility over the reporting period.

[§114(a)(3) of the CAA] [§§5-402 and 5-1015(a)(11) of the *Regulations*]

- (43) Notification of Closure: The Permittee shall notify the Agency of permanent closure of the LFGTE Operation within thirty (30) days of cessation of electrical energy production. [10 V.S.A. §§556(c) and 556a(d)] [§5-402(1) and §5-1015(a)(5) of the *Regulations*]
- (44) Annual Registration: The Permittee shall calculate the quantity of emissions of air contaminants from the LFGTE Operation annually. If the Facility emits more than five (5) tons of any and all air contaminants per year, the Permittee shall register the source with the Secretary of the Agency (hereinafter "Secretary"), and shall renew such registration annually. Each day of operating a source which is subject to registration without a valid, current registration shall constitute a separate violation and subject the Permittee to civil penalties. The registration process shall follow the procedures set forth in Subchapter VIII of the *Regulations*, including the payment of the annual registration fee on or before May 15 of each year. [Subchapter VIII §§5-802, 5-803, 5-807, 5-808 of the *Regulations*]
- (45) All records, notifications and reports that are required to be submitted to the Agency by this Permit shall be submitted to:

Agency of Natural Resources
Department of Environmental Conservation
Air Quality & Climate Division
One National Life Drive, Davis Building, Second Floor
Montpelier, Vermont 05620-3802

[§5-402 of the *Regulations*]

- (46) All records, notifications and reports that are required to be submitted to the U.S. EPA by this Permit shall be submitted to:

Air Compliance Clerk
U.S. EPA-New England
5 Post Office Sq. Suite 100 (OES04-2)
Boston, MA 02109-3912

[§5-402 of the *Regulations*]

- Permit Shield -

- (47) In accordance with §5-1015(a)(14) of the *Regulations*, the Facility is granted a "permit shield" and is not subject to the regulations and standards listed in Finding of Fact (F)(b) of this Permit. The Agency's "permit shield" determination is based upon the information submitted by the Permittee in their application. The "permit shield" shall be binding only with respect to activities disclosed in the Permittee's application. [§5-1015(a)(14) of the *Regulations*]

- Stratospheric Ozone Protection -

- (48) Protection of Stratospheric Ozone - Recycling and Emissions Reduction. The Permittee shall comply with the standards for recycling and emissions reduction pursuant to 40 *CFR* Part 82, Subpart F:
- (a) Persons opening appliances for maintenance, service, repair, or disposal must comply with the required practices specified in 40 *CFR* Part 82, Subpart F §82.156.
 - (b) Equipment used during the maintenance, service, repair, or disposal of appliances must comply with the standards for recycling and recovery equipment as specified in 40 *CFR* Part 82, Subpart F §82.158.
 - (c) Persons performing maintenance, service, repair, or disposal of appliances must be certified by an approved technician certification program as specified in 40 *CFR* Part 82, Subpart F §82.161.
 - (d) Commercial or industrial process refrigeration equipment must comply with the leak repair requirements specified in 40 *CFR* Part 82, Subpart F §82.156.
 - (e) For each appliance normally containing fifty (50) or more pounds of refrigerant, the Permittee shall keep records of refrigerant purchased and added to such appliances as specified in 40 *CFR* Part 82, Subpart F §82.166.

[40 *CFR* Part 82, Subpart F]

- Standard Permit Conditions -

- (49) At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Agency which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. [10 V.S.A. §§556(c) and 556a(d)] [40 CFR Part 60.11(d) and 63.6(e)]
- (50) Approval to construct or modify under this Permit shall become invalid if construction or modification is not commenced within eighteen (18) months after issuance of this Permit, if construction or modification is discontinued for a period of eighteen (18) months or more, or if construction is not substantially completed within a reasonable time. The Agency may extend any one of these periods upon a satisfactory showing that an extension is justified. The term "commence" as applied to the proposed construction or modification of a source means that the Permittee either has:
- (a) Begun, or caused to begin, a continuous program of actual on-site construction or modification of the source, to be completed within a reasonable time; or
 - (b) Entered into binding agreements or contractual obligations, which cannot be cancelled or modified without substantial loss to the Permittee, to undertake a continuous program of actual on-site construction or modification of the source to be completed within a reasonable time.
- [10 V.S.A. §556(c)] [§5-501 of the *Regulations*]
- (51) These Permit conditions may be suspended, terminated, modified, or revoked for cause and reissued upon the filing of a written request with the Secretary of the Agency (hereinafter "Secretary") or upon the Secretary's own motion. Any modification shall be granted only with the written approval of the Secretary. If the Secretary finds that modification is appropriate, only the conditions subject to modification shall be re-opened. The filing of a request for modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated non-compliance does not stay any terms or conditions of this Permit. The Secretary may provide opportunity for public comment on any proposed modification of these conditions. If public comments are solicited, the Secretary shall follow the procedures set forth in 10 V.S.A. §556 and §556a, as amended. [10 V.S.A. §§556(d) and 556a(g)] [§§5-1008(a) and 5-1008(e) of the *Regulations*]

- (52) Cause for reopening, modification, termination and revocation of this Permit includes, but is not limited to:
- (a) Inclusion of additional applicable requirements pursuant to state or federal law;
 - (b) A determination that the permit contains a material mistake or that inaccurate information was used to establish emissions standards or other terms or conditions of the operating permit;
 - (c) A determination that the operating permit must be modified or revoked to ensure compliance with applicable requirements;
 - (d) A determination that the subject source has failed to comply with a permit condition;
 - (e) For Title V subject sources, a determination by U.S. EPA that cause exists to terminate, modify, revoke or reissue an operating permit;
 - (f) Those causes which are stated as grounds for refusal to issue, renew or modify an operating permit under §5-1008(a) of the *Regulations*; or
 - (g) If more than three (3) years remain in the permit term and the source becomes subject to a new applicable requirement.

[§5-1008(e)(4) of the *Regulations*]

- (53) The Permittee shall furnish to the Agency, within a reasonable time, any information that the Agency may request in writing to determine whether cause exists to modify, revoke, reissue, or terminate the Permit or to determine compliance with this Permit. Upon request, the Permittee shall also furnish to the Agency copies of records required to be kept by this Permit. [10 V.S.A. §§556(c) and 556a(d)] [§5-402 of the *Regulations*] [40 CFR Part 70 §70.6(a)(6)(v)]
- (54) By acceptance of this Permit, the Permittee agrees to allow representatives of the State of Vermont access to the properties covered by the Permit, at reasonable times, to ascertain compliance with Vermont environmental and health statutes and regulations and with this Permit. The Permittee also agrees to give the Agency access to review and copy any records required to be maintained by this Permit, and to sample or monitor at reasonable times to ascertain compliance with this Permit. [10 V.S.A. §§556(c), 556a(d) and 557] [§§5-402, 5-404, and 5-1015(a)(10) of the *Regulations*]
- (55) All data, plans, specifications, analyses and other information submitted or caused to be submitted to the Agency as part of the application for this Permit or an amendment to this Permit shall be complete and truthful and, for Title V permit applications, certified by a responsible official whose designation has been approved by the Secretary. Any such submission which is false or misleading shall be sufficient grounds for denial or revocation of this Permit, and may result in a fine and/or imprisonment under the authority of Vermont statutes. [10 V.S.A. §§556(c) and 556a(d)] [§§5-505 and 5-1006(f) of the *Regulations*]
- (56) For the purpose of establishing whether or not a person has violated or is in violation of any condition of this Permit, nothing in this Permit shall preclude the use, including the exclusive use, of any credible evidence or information relevant to whether a source would have been in compliance with applicable requirements if the appropriate performance or compliance test or procedure had been performed. [10 V.S.A. §§556(c) and 556a(d)]

- (57) Any permit noncompliance could constitute a violation of the federal Clean Air Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. [10 V.S.A. §§556(c) and 556a(d)] [§§5-1008(a) and 5-1008(e) of the *Regulations*]
- (58) It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity to maintain compliance with the conditions of this Permit. [10 V.S.A. §§556(c) and 556a(d)]
- (59) No person shall build, erect, install or use any article, machine, equipment or other contrivances, the use of which, without resulting in a reduction in the total release of air contaminants to the atmosphere, reduces or conceals an emission which otherwise would constitute a violation of these *Regulations*. [§5-403 of the *Regulations*]
- (60) The provisions of this Permit are severable. If any provision of this Permit, or its application to any person or circumstances is held invalid, illegal, or unenforceable by a court of competent jurisdiction, the invalidity shall not apply to any other portion of this Permit which can be given effect without the invalid provision or application thereof. [10 V.S.A. §§556(c) and 556a(d)]
- (61) This Permit does not convey any property rights of any sort or any exclusive privilege, nor does it authorize any injury to private property or any invasion of personal rights. [10 V.S.A. §§556(c) and 556a(d)]
- (62) All subsequent owners and/or operators of this Facility must request an amendment and transfer of this Permit prior to commencing any operations covered by this Permit. All subsequent owners and/or operators shall submit to the Agency as part of the request for amendment all such information the Agency deems necessary to establish legal ownership and/or interest in the property and all such information the Agency deems necessary to ensure the new owners and/or operators will construct and operate the Facility in compliance with the *Regulations* and this Permit. The terms and conditions of this Permit shall remain in full force and effect after submittal of the request for amendment and until the issuance of an amended Permit or denial. Should the Secretary deny the request, the new owner and/or operator must take whatever action is necessary to comply with the denial. [10 V.S.A. §§556 and 556a] [§§5-501, 5-1004, and 5-1013(a) of the *Regulations*]

- (63) Renewable Energy Projects – Right to Appeal to Public Service Board: If this decision relates to a renewable energy plant for which a certificate of public good is required under 30 V.S.A. §248, any appeal of this decision must be filed with the Vermont Public Service Board pursuant to 10 V.S.A. §8506. This section does not apply to a facility that is subject to 10 V.S.A. §1004 (dams before the Federal Energy Regulatory Commission), 10 V.S.A. §1006 (certification of hydroelectric projects) or 10 V.S.A. Chapter 43 (dams). Any appeal under this section must be filed with the Clerk of the Public Service Board within 30 days of the date of this decision; the appellant must file with the Clerk an original and six copies of its appeal. The appellant shall provide notice of the filing of an appeal in accordance with 10 V.S.A. 8504(c)(2), and shall also serve a copy of the Notice of Appeal on the Vermont Department of Public Service. For further information, see the Rules and General Orders of the Public Service Board, available on line at www.psb.vermont.gov. The address for the Public Service Board is 112 State Street, Montpelier, Vermont, 05620-2701 (Tel. # 802-828-2358).
- (64) All Other Projects – Right to Appeal to Environmental Court: Pursuant to 10 V.S.A. Chapter 220, any appeal of this decision must be filed with the clerk of the Environmental Court within 30 days of the date of the decision. The Notice of Appeal must specify the parties taking the appeal and the statutory provision under which each party claims party status; must designate the act or decision appealed from; must name the Environmental Court; and must be signed by the appellant or their attorney. In addition, the appeal must give the address or location and description of the property, project or facility with which the appeal is concerned and the name of the applicant or any permit involved in the appeal. The appellant must also serve a copy of the Notice of Appeal in accordance with Rule 5(b)(4)(B) of the Vermont Rules for Environmental Court Proceedings. For further information, see the Vermont Rules for Environmental Court Proceedings, available on line at www.vermontjudiciary.org. The address for the Environmental Court is 2418 Airport Road, Suite 1, Barre, VT 05641 (Tel. # 802-828-1660).
- (65) Conditions (1) through (8), (10), (13) through (18), (20), (21), and (25) through (29) are derived from the new source review requirements of Subchapter V of the *Regulations*. With the exception of the cited new source review conditions, this Operating Permit shall expire as indicated on the cover page to this Permit. The Permittee shall submit to the Agency a complete application for renewal of the Operating Permit at least twelve (12) months before the expiration of the Operating Permit. If a timely and administratively complete application for an operating permit renewal is submitted to the Secretary, but the Secretary has failed to issue or deny such renewal before the end of the term of this Operating Permit, then the Permittee may continue to operate the subject source and all terms and conditions of this Operating Permit shall remain in effect until the Secretary has issued or denied the operating permit renewal. However, this Operating Permit shall automatically expire if, subsequent to the renewal application being determined or deemed administratively complete pursuant to §5-1006 of the *Regulations*, either Permittee fails to submit any additional information required by the Secretary as well as information pertaining to changes to the Facility within thirty (30) days or such other period as specified in writing by the Secretary. [§§5-1011 and 5-1012(a) of the *Regulations*] [§§5-1005(c) and 5-1012 of the *Regulations*]

- (66) The conditions of this Permit as set forth above supersede all conditions contained in all prior Permits issued by the Agency related to the LFGTE Operation at this Facility. [10 V.S.A. §§556(c) and 556a(d)]

The Agency's issuance of this Air Pollution Control Permit relies upon the data, judgment, and other information supplied by the Permittee. The Agency makes no assurances that the air contaminant source approved herein will meet performance objectives or vendor guarantees supplied to the source Permittee. It is the sole responsibility of the Permittee to operate the source in accordance with the conditions herein and with all applicable state and federal standards and regulations.

Dated this 4th day of March, 2016.

Agency of Natural Resources

Alyssa B. Schuren, Commissioner
Department of Environmental Conservation

By: Heidi Hales
Heidi C. Hales, Director
Air Quality & Climate Division

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State of Vermont
Department of Environmental Conservation
Air Quality & Climate Division
Davis Building – 2nd Floor
One National Life Drive
Montpelier, VT 05620-3802
(802) 828-1288
FAX (802) 828-1250

AGENCY OF NATURAL RESOURCES

March 4, 2016

Dan Weston
Coventry Clean Energy Corporation
40 Church Street
East Montpelier, VT 05651

RE: Final Title V Air Pollution Control Permit to Construct and Operate (#AOP-15-032)
Coventry Municipal Solid Waste Facility - Landfill Gas to Energy Operation (LFGTE Operation)

Dear Mr. Weston:

The Vermont Agency of Natural Resources, Department of Environmental Conservation, Air Quality & Climate Division (Agency) has completed its review of Coventry Clean Energy Corporation's (CCEC's) application for the following proposed modifications at the Coventry Municipal Solid Waste Facility (Facility) – Landfill Gas to Energy Operation (LFGTE Operation) and the renewal of the Title V Permit to Operate the LFGTE Operation portion of the Facility located at 21 Landfill Lane in the town of Coventry, Vermont:

- A proposed increase in the carbon monoxide (CO) emission rate from the CAT 3520C engines to 3.5 grams per brake horsepower hour (g/bhp-hr) from the previously permitted 2.75 g/bhp-hr,
- An increase in the stack height on the CAT 3520C engines from 28 feet to 34 feet above grade,
- The installation of a siloxane removal system to remove siloxanes in LFG, and minimize the formation of siliceous deposits in the CAT G3520C engines, which will include the installation of an enclosed flare to combust offgas from regeneration of the SRS media bed.

The Agency is now issuing a final Title V Air Pollution Control Permit to Construct and Operate approving the proposed project.

The CCEC LFGTE Operation is located on property leased from New England Waste Services of Vermont, Inc's (NEWSVT's) Coventry Landfill (Landfill Operation). The Landfill Operation and the LFGTE Operation are considered to be a single source of air emissions, and are collectively referred to the Facility. While the Facility is considered a single stationary source of emissions for purposes of permitting, separate permits are being issued, one to each owner/operator of the two operations at the Facility. The permit for the LFGTE Operation is being issued to CCEC and the permit for the Landfill Operation is being issued to NEWSVT. Each permit contains certain permit conditions and responsibilities that are shared between the two owner/operators while some conditions and responsibilities are considered solely the responsibility of one entity or the other.

Previously, all activities at the Facility were contained under a single permit issued to NEWSVT. The new permit structure is intended to provide a more appropriate allocation of permit responsibilities at the Facility for each individual owner/operator at the Facility.

Consistent with the provisions of 10 V.S.A. §556(e) and for the purposes of reducing the administrative burden of enforcing two separate permits for this Facility, the Agency has combined



approval for the Air Pollution Control Permit to Construct with the approval for the Air Pollution Control Permit to Operate. The result is a combined Air Pollution Control Permit to Construct and Operate which satisfies both the construction permit (10 V.S.A. §556 and Subchapter V of the Regulations) and operating permit (10 V.S.A. §556a and Subchapter X of the Regulations) requirements for your Facility. This combined permit incorporates and supersedes all prior Permit to Construct and/or Operate approvals issued in the past. Please note this permit is valid for a period of five (5) years and an application to renew the permit must be filed at least twelve (12) months prior to the date of expiration.

Please review this Permit carefully to ensure that you are currently, and continue to be, in compliance with all the requirements contained in this Permit. There are a few key points included in this permit or that you may otherwise be subject to that the Agency would like to highlight for your convenience:

- CAT 3520C Engine Emission Limits: Condition (14) of this Permit limits emissions of carbon monoxide (CO), nitrogen oxides (NOx), nonmethane organic compounds (NMOCs), and particulate matter (PM) from the CAT 3520C engines at the LFGTE Operation. The specific emission limits that apply to all CAT 3520C engines at the LFGTE Operation are contained in Condition (14) of this Permit.
- CAT 3520C Engine #5 VOC Emission Limits: Condition (15) of this Permit limits emissions of VOCs from the CAT 3520C engine Engine #5. This engine is subject to 40 CFR, Part 60, Subpart JJJJ, and is subject to a 1.0 gram per brake horsepower hour (g/bhp-hr) emission limit for VOCs
- CAT 3520C Engines Annual Emissions Testing: Condition (25) of this Permit describes the annual emissions testing requirements for the CAT 3520 engines at the LFGTE Operation. Engine #5 must be tested every three (3) years, or every 8,760 hours of operation, whichever comes first. Two engines from the remaining four engines (Engines #1, #2, #3, and #4) must be tested every other year, and the same engines cannot be tested in consecutive years. Additional details describing the testing requirements for the engines at the LFGTE Operation are provided in Condition (25) of this permit.
- CAT 3520C Engines - VOC Emissions Testing: Condition (26) of this Permit requires that two (2) of the CAT 3520C engines at the LFGTE Operation have a stack test performed for VOCs including, but not limited to formaldehyde and acetaldehyde, and a written report of the test results shall be provided to the Agency no later than December 31, 2016.
- CAT 3520C Engines - PM Emissions Testing: Condition (27) of this Permit requires that two (2) of the CAT 3520C engines at the LFGTE Operation have a stack test performed for total particulate matter and a written report of the test results shall be provided to the Agency no later than December 31, 2016. Testing to characterize the particulate emissions shall include, but not be limited to particle size distributions and particle composition.
- Control of Facility SO₂ Emissions: Condition (16) of this Permit limits emissions of SO₂ from the Facility such that they shall not equal or exceed 40 tons per rolling 12-month period, requires periodic monitoring of LFG flow and the concentration of hydrogen sulfide (H₂S) in the LFG. The procedure for calculating SO₂ emissions is contained in Condition (16) of this Permit. Condition (35) of this Permit requires that records shall be maintained of LFG flow measurements and associated H₂S concentration measurements.

This 40-ton SO₂ emission limit is a Facility-wide limit, and CCEC will need to coordinate with NEWSVT regarding LFG flow measurements, H₂S concentration measurements, and calculation of Facility-wide SO₂ emissions.

- Control of Facility PM Emissions: Commencing with emissions from the month of January 2017 forward, Condition (17) of this Permit limits emissions of total PM from the Facility, such that they shall not equal or exceed 19.8 tons per rolling 12-month period, and requires periodic monitoring of LFG flow and the concentration of silica (Si) in the LFG. The procedure for calculating PM emissions is contained in Condition (17) of this Permit. Condition (36) of this Permit requires that records shall be maintained of LFG flow measurements and associated Si concentration measurements.

This 19.8-ton PM emission limit is a Facility-wide limit, and CCEC will need to coordinate with NEWSVT regarding LFG flow measurements, Si concentration measurements, and calculation of Facility-wide PM emissions.

- Control of Facility VOC Emissions: Condition (18) of this permit limits emissions of VOCs from the Facility such that they shall not equal or exceed 50 tons per rolling 12-month period. The procedure for calculating VOC emissions is contained in Condition (18) of this Permit.

This 50-ton VOC emission limit is a Facility-wide limit, and CCEC will need to coordinate with NEWSVT regarding the calculation of Facility-wide VOC emissions

- Startups, Shutdowns and Malfunctions (SSM) Plan: Condition (28) of this permit requires the development and implementation of a written SSM Plan in accordance with 40 CFR Part 63 Subpart A §63.6(e)(3). The SSM Plan shall be developed and submitted to the Agency within ninety (90) days of Permit issuance.

The Permittee shall submit a semi-annual SSM report to the Agency that details all actions taken during periods of startup, shutdown and malfunctions

- Operation and Maintenance Plan - Siloxane Removal System: Condition (29) of this permit requires the development and implementation of a written operation and maintenance plan (O&M Plan) for the siloxane removal system (SRS) within thirty (30) days following commencement of operation of the SRS.

- Fuel Oil Sulfur Content: Consistent with New England regional efforts, Vermont has adopted regulations that will be lowering the allowed sulfur content of fuels oils between the years 2014 and 2018. Commencing on July 1, 2014, the sulfur content of No.2 and lighter distillate oils purchased shall not exceed 0.05 percent by weight and commencing July 1, 2018 such oils shall not exceed 0.0015 percent by weight (15 ppm). Distillate fuel oils meeting the 0.0015% by weight sulfur limit are commonly referred to as ultra-low sulfur diesel (ULSD). To the extent your permit may currently allow higher sulfur content fuel oils, this regulation will take precedence and further restrict your sulfur content on the respective dates. The Permit also requires obtaining a certification or invoice regarding the sulfur content of the fuel oil from the fuel supplier, for each shipment of fuel oil received at the Facility.

If you have any questions or comments, please feel free to contact me by phone at (802) 272-3445, by email at tony.mathis@vermont.gov, or in writing at the above address.

Sincerely,



Tony Mathis, Environmental Engineer
Engineering Services/Permitting Section
Air Quality & Climate Division

cc: Joe Gay - New England Waste Services of Vermont, Inc.

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