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Dr. David Matthews
Senior Inspector
Office of Environmental Sustainability
Environmental Protection Agency
Headquarters PO Box 3000
Johnstown Castle Estate
County Wexford.

31st August 2022

<u>Re: Application for Licence Reg No: W0287-02</u>

Dear Dr Matthews,

I refer the Agency's letter dated 5th July 2022 in accordance with Regulation 10(2)(b)(ii) of the EPA (Industrial Emissions) (Licensing) Regulations 2013 in respect of a licence review from Ormonde Organics Limited for an installation located at Ormonde Organics Limited (Portlaw), Killowen, Portlaw, Waterford.

The requested information is set out herein. The EPA's requests are set out in italics followed by the response.

1. Confirm if all List of Waste (LoW) codes proposed to be accepted at the installation under the review are included in the table entitled "List of Wastes by R&D Code and Treatment Type", provided on page 14 of attachment "Application Form - Application Form - LA007262" of the application. It is noted that the following LoW codes are catered for in the existing licence, but not requested in the licence review application: 02 03 99, 07 05 12, 19 09 02, and 20 02 02. Amend the table as needed. [Regulation 9(1)(f)].

It is not possible to amend the pdf table in the authorisation module in the EDEP Portal; however we confirm that Ormonde Organics seeks approval to continue to accept LoW 02 03 099, 07 05 12, 19 09 02 and 20 02 02.

2. *It is noted that the location of the off-site groundwater monitoring well is unknown, as it is covered by undergrowth, as stated in the attachment "Application Form — Baseline Report — 4-8 Baseline Assessment" of the application. Confirm if the two remaining groundwater monitoring wells on site are sufficient to monitor groundwater quality at the facility. [Regulation 9(1)(j)].*

   We refer to the response to Item 7 of the Agency's further information request dated 12th April 2020 and confirm that we consider the two bedrock groundwater monitoring wells are sufficient to monitor groundwater quality at the facility.

3. *The existing licence allows for the installation of a third CHP Plant Gas Engine, with associated air emission point AEP-3. This CHP Plant Gas engine has not yet been installed at the installation. Clarify if this engine and associated air emission point are still required in the revised licence. [Regulation 9(1)(j)*

   The third engine and associated air emission point is still required and this proposed emission point will be included in the air dispersion modelling being carried out in accordance with Item 3 of the Agency's FI request dated 12th April 2022.

4. *During the site visit carried out on the 28th June 2022, the gas bottling plant was inspected. It was noted that there was a stack attached to the scrubber system on the plant for removing carbon dioxide from the biogas, prior to the gas being bottled. No information was provided on the emissions from this stack in the application form. The applicant outlined that they considered the gas bottling plant stack to be a minor emission point. If this is the case, please complete Attachment 7.4.2 Emissions to Atmosphere — Minor and Potential Emissions of the application form. In addition, please provide more details on the gas bottling plant system, including the technology, the emissions from it, and reasons why it is a minor emission point. If this emission point is considered to be a main emission point, please update and resubmit the attachment "Application Form - Emissions - Air Section - 7.4-1-Air" and include the emissions from the gas bottling plant in the air dispersion model, which is currently being prepared. [Regulation 9(2)(i)].*

   A specification for the biogas upgrader installed at the site is in Attachment 1. The upgrader removes the carbon dioxide from the biogas and this is vented to atmosphere.

   Main emissions include all emissions of environmental significance. Where a mass emission threshold is specified in a BAT document (BAT Conclusions, National BAT note or BREF), emissions which exceed this threshold prior to abatement are regarded as significant, i.e., ‘main emissions’. (In some cases emissions below the threshold can still be significant and qualify as Main Emissions).

There are no emission limits set for carbon dioxide in either the BREF/BAT Conclusions for Waste Treatment (2018), or the Medium Combustion Directive (2015) and therefore a mass emission threshold for carbon dioxide has not been established. Furthermore, the Agency does not specify emission limit values for carbon dioxide emissions from waste treatment activities.

Ormonde Organics requested the installer (Host) of the upgrader to assess the significance of the emission and they concluded that it was a minor emission (Refer to Attachment 2). Ormonde Organics provided this conclusion to the Office of Environmental Enforcement.

Attachment 7.4.2 Emissions to Atmosphere — Minor and Potential Emissions has been completed and a copy is in Attachment 3.

Yours Sincerely

Jim O’Callaghan

ATTACHMENT 1

BIOGAS UPGRADER - SPECIFICATION

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TAB 1

Introduction

Gas upgrading plant

Ref.	: Manual TAB 1, rev02
Date	: 27-10-2020
Author:	: P. Popma
Appr. by	: P. Popma

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Index

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1. Gas upgrading process

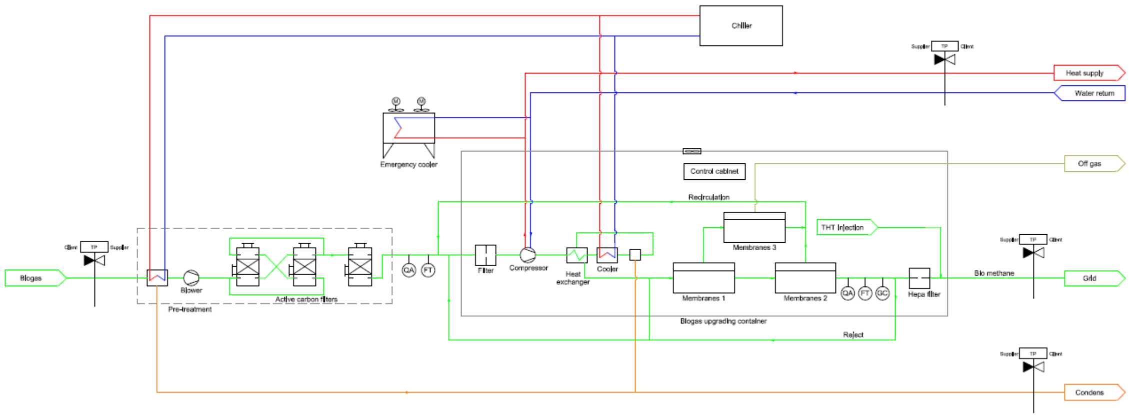
1.1 Process description

In the gas upgrading plant biogas from anaerobic digestion is upgraded to natural gas quality by using membrane separation technology. The process consists of the following steps: 1) Biogas pre-treatment (optional), 2) Compressor, 3) Membranes, 4) Grid entry unit (optional), 5) Heat recovery (optional), and CO_2 liquefaction (optional).

In the biogas pre-treatment, the raw biogas is cooled down to condense the entrained water and subsequently it is blown through activated carbon filters to remove sulphur and other contaminants from the raw biogas. In the compressor the pre-treated biogas is boosted to high pressure to generate a driving force for the membranes to separate

(55% CH_4, 45% CO_2) into biomethane and an off-gas stream (>99% CO_2). In the grid entry unit, the biomethane is analyzed and when it meets all the injection requirements the gatekeeper valve is opened towards the grid or CNG station; offgas is either blown into the atmosphere or sent to the liquefaction unit. The heat that is released during the gas upgrading process can be recovered and supplied to the digester heating system by using a heat pump.

In Figure below a schematic overview of the process is displayed.



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2. Biogas pre-treatment (optional)

In the biogas pre-treatment, the raw biogas is cooled down to condense the entrained water and subsequently it is blown through activated carbon filters to remove sulfur and other contaminants from the raw biogas.

2.1 Biogas cooler

The biogas cooler is a gas/water heat exchanger which cools down the raw biogas from the AD (+/- 40 °C) to 5 °C, with chilled water of 0 °C. By decreasing the temperature of the biogas, the vapor pressure of water decreases and therefore it condenses. The condensed water is drained towards the condensate pit.

2.2 Biogas blower

The biogas blower is a (two-stage) centrifugal ventilator that blows the biogas through the activated carbon filters, and thereby supplies suction pressure for the compressor.

2.3 Activated carbon filters

The raw biogas is blown through activated carbon filters in order to remove H_2S and other contaminants (e.g. siloxanes, terpenes, aromatics, VOCs, etc.). These components have to be removed from the biogas since they can cause irreversible damage to the compressor, membranes and other equipment. The H_2S content of the biogas is monitored before, between and after the AC filter, and the gas upgrading unit is shut down at H_2S content > 10 ppm. Careful monitoring of the H_2S content of the biogas and regular replacement of the AC filters is therefore advised.

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02 Siloxanes, terpenes, aromatics and VOC's are not monitored in the biogas upgrader since a commercial in-line analyses is not available. To monitor the quality of the biogas and status of this dedicated activated carbon filter it is strongly advised to take samples (both upstream and downstream the filter) on a regular bases and have this analyzed by a laboratory. Presence and quantities are strongly related to the menu of the digester and are difficult to predict. If the menu doesn't change, we advise to first take samples on a monthly bases during half a year and, after more knowledge is gathered, lower the frequency.

Siloxanes, terpenes, aromatics and VOC's can pollute the membranes and also tone down the smell of the THT (odorization) added to the biomethane later in the process causing a rejection of the biomethane by the grid operator.

3. Compressor

The compressor equipment is designed to supply compressed gas for specific applications at rated pressure and capacity. The system consists of a rotary screw compressor, oil injected, directly coupled to an electric motor with all usual accessories such as electric control panel, compressed gas after cooler, all included into a silenced indoor canopy.

The system includes a frequency converter allowing variable speed of the electric motor which results in notable energy saving. The system is totally air cooled and is designed and built for continuous operation.

A brief description of system main components follows.

3.1 Inlet Gas Filter

The inlet gas filter is recommended to prevent particles from entering the compressor. Condensate is automatically drained to prevent residual moisture entering the compressor.

3.2 Suction Valve

The suction valve consists of a 3-way N.C. solenoid valve which regulates the intake of gas inside the gas end by using a pneumatic command block. Depending on whether it is opened or closed it determines the operation state of the machine:

- Open Load: The compressor is running and delivering compressed gas
- Close Off-load: The compressor is running but not delivering any compressed gas

During the Off-load state a nozzle allows a minimum gas flow to enter the screw in order to maintain a minimum pressure for oil circulation. Intake gas is then re-circulated and sent to the suction inlet. Higher size compressors also have a valve for gas injection to prevent vacuum formation and to lower the noise during Off-load operation. Furthermore the compressed gas is by-passed to the intake through a needle valve and then sent to suction.

3.3 Screw Compressor (Gas End)

The gas end has a screw block, is single stage, oil injected and consists of two rotors: one male with lobes and one female with caves with asymmetric profile. The rotation of the two rotors results in the compression of the gas sucked in continuously and without pulsation.

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The gas end is connected directly to an electric motor through a bell housing and a flexible coupling. Direct transmission in this range of power is an important characteristic of the screw compressor packages since it allows the operation of the gas end with the maximum efficiency.

The compression is achieved in a unique stage. The oil's functions are:

1. Sealing between the two rotors and between the rotors and the housing.
2. Lubrication of all mechanical rotating parts.
3. Removal of the heat generated by the compression process.

3.4 Gas/Oil Separator (Receiver)

This receiver contains the compressed gas/oil mix. It allows the first mechanical separation between gas and oil with the oil collecting in the bottom. It is fitted with a visor to verify if the oil quantity in the oil circuit is enough. The separator is designed to handle the maximum capacity at the lowest discharge pressure and the highest discharge temperature.

3.5 Gas/Oil Separator Cartridge

This filter separates the oil mixed with the compressed gas through a filtering element.

3.6 Oil Recover Visor (Oil Scavenge Line Visor)

This visor carries back to the gas end the oil which has been separated by the gas inside the gas/oil separator cartridge. A nozzle is fitted inside it to get the ideal oil flow for a good oil separation inside the separator cartridge.

3.7 Oil Filter

It is extremely important that the oil injected into the gas end is as clean as possible. This component filters the oil before it is re-injected into the gas end.

3.8 Minimum Pressure Valve/Non Return Valve

This valve maintains a minimum pressure in the gas/oil separator. It also prevents the back-flow of the compressed gas from the discharge to the compressor when it is stopped. Furthermore during the startup sequence it remains closed unless the minimum pressure of 3-4 bar is reached.

3.9 Safety Valve

The safety valve discharges the gas in case of overpressure inside the gas/oil internal circuit due to a failure. It can be fitted with conveyed discharge to conduct the discharged gas to a safe area.

3.10 Thermostatic Valve

This valve controls the injection temperature of the oil into the gas end. It allows the oil leaving the gas/oil receiver to by-pass the oil cooler depending on the temperature of the oil itself by draining it directly to the oil filter.

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3.11 Gas/Oil After cooler

This combined cooler is an air-cooled heat exchanger using an electric fan and is divided into two sectors: the gas cooler circuit and the oil cooler circuit.

The oil cooler is sized to suit the capacity of the compressor being cooled. The cooler is designed to handle the worst operating condition which is usually based on the lowest suction pressure and the highest discharge pressure.

3.12 Water Cooled Gas Heat Exchanger

When the unit is water cooled there is also a stainless plate type heat exchanger to cool the gas to remove moisture from the gas.

3.13 Gas gas heat exchanger

The gas is reheated again with a gas-gas heat exchanger in order elevate the temperature of the gas at least 20 °C above its dew point. The gas outlet temperature of the compressor to the membranes is controlled by a manualvalve in the gas circuit.

3.14 Condensate Separator

The condensate separator extracts vapor condensates from compressed gas after the cooling in the after cooler or in the heat exchangers (both air cooled as well as water cooled), and drain it in its automatic condensate drainer.

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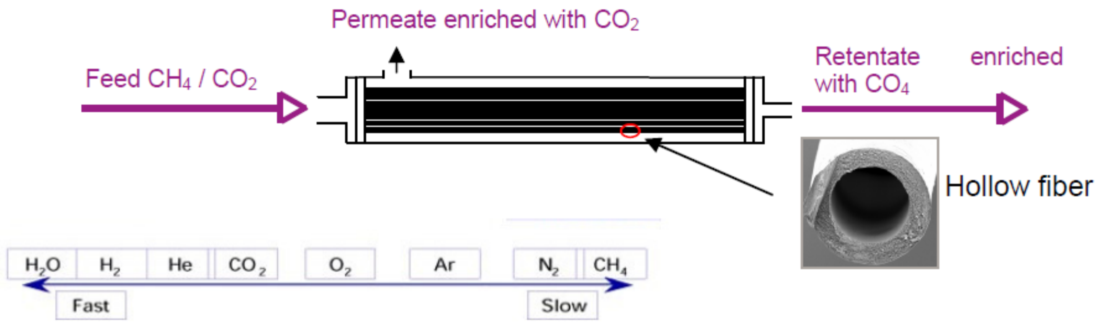
4. Membranes

In the membranes, biogas (53% CH_4, 47% CO_2) is separated into biomethane (max. 97% CH_4) and CO_2 off gas (> 99% CO_2). The membranes are made of a polymer material that can be regarded as a filter, in which the CO_2 can easily permeate through the polymer material and methane cannot. By average CO_2 permeates 50 times faster through the membrane than methane, which results in a very high selectivity.



A membrane module contains a bundle of thousands of hollow fibers that functions as a membrane, which is inserted into a pipe. The pipe ends are embedded in a synthetic resin. The module is then pressurized from the inside with a gas mixture, and a pressure of up to 16 bar is applied. The driving force that enables the gas to permeate the membrane is the partial pressure differential of the gas between the retentate side (= interior of the hollow fibers) and the permeate side (= exterior of the hollow fibers). The larger the difference, the more gas will permeate the membrane. When carbon dioxide and methane are separated, for instance, it is predominantly the carbon dioxide which passes through the membrane, while the methane is kept back. The membrane essentially serves as a filter and keeps the methane on the outlet side. Separation thus results in a permeate enriched with carbon dioxide and a retentate enriched with methane.

The membrane system is executed in a 3-stage configuration:

1) In stage 1, a rough separation is carried out whereby the CH_4-rich stream (retentate) is led to stage 2 and the CO_2-rich stream (permeate) is led to stage 3.
2) In stage 2, a fine separation of the retentate of stage 1 is carried out whereby the retentate is of biomethane quality (max. 97% CH_4), and the permeate is recycled to the inlet of the compressor to keep the overall methane yield as high as possible. Biomethane quality is controlled with the retentate pressure up to 16 bar.
3) In stage 3, the residual methane in the permeate of stage 1 is recovered on the retentate side and recycled to the inlet of the compressor in order to keep the overall methane yield as high as possible. The permeate consists of pure (> 99%) CO_2 which is either vented to the air or used for liquefaction. The amount of methane slip and the recycle rate are controlled with the retentate pressure and is generally kept between 2 – 4 bar for an optimal trade-off.

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5. Gatekeeper

In order to be able to inject the biomethane into the gas grid or send it to the grid entry unit, certain quality requirements must be met. The “gatekeeper” is a 3-way valve that will open towards the grid entry/CNG compressor unit when all these requirements are met. When biomethane is injected into the grid/CNG station, normally the CO_2 off-gas will be vented to the air or (optional) will be fed to the CO_2 liquefaction unit.

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6. Container monitoring

For safety and process control, the membrane container is continuously monitored on the following parameters:

- Temperature; the temperature in the membrane container should always be > 15 °C in order prevent condensation of moisture in the membranes. The gas upgrading unit is automatically shut down when the temperature in the membrane container drops below 15 °C. Electric heaters are installed in order to maintain a temperature of 25 °C.

- The membrane container is continuously ventilated and the ventilation flow is safeguarded with a flow sensor, in accordance with NEN-EN-IEC 60079-10-1:2015.

- LEL detection; in order to prevent the formation of an explosive mixture inside the container, the %LEL (percentage of the lower explosion limit (LEL); the minimum concentration of biogas at which it will form an explosive mixture with air) is continuously monitored. When >20% LEL is detected, the gas upgrading unit will automatically shut down and the warning light above the container door will blink to indicate the possibility of a gas leakage.

- Smoke/heat detection; this is continuously monitored and when smoke or heat is detected, the gas upgrading unit will automatically shut down.

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7. Heat recovery (optional)

The heat that is produced in the gas upgrading process can be recovered in 2 ways:

1) The heat that is retrieved from gas cooling (low-temperature heat) can be recovered as high-temperature heat by means of a heat pump, by which water of up to 65 °C can be produced.

2) The heat that is retrieved from oil cooling in the compressor can be recovered with an oil-water heat exchanger, by which water of up to 85 °C can be produced.

The hot water that is produced in the heat recovery section is connected to the heat distribution header of the (digestion) plant. Cold water is supplied from the cold distribution header to the heat recovery section of the gas upgrading plant. When the supplied water is not cold enough, (part of) the supplied water will be led through a dry cooler in order to reach the required temperature.

ATTACHMENT 2

HOST ASSESSMENT

MINOR EMISSIONS

Jim O'Callaghan

From:	Denis Mullally <dmullally@ormondeorganics.ie>
Sent:	Friday 26 August 2022 14:40
To:	Jim O'Callaghan
Subject:	FW: Minor emissions biogas upgrading unit
Attachments:	B304 - Process & Technical Datasheet.pdf

Here you go Jim.

....
Denis Mullally
Facility Manager

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....
Ormonde Organics
Killowen, Portlaw, Co. Waterford, Ireland. X91 Y9VW.

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....

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....

Science. Traceability. Experience.

From: Koen Verstraeten <koen.verstraeten@host.nl>
Date: Wednesday 29 December 2021 at 15:59
To: Denis Mullally <dmullally@ormondeorganics.ie>
Cc: Jeffrey Kruit <j.kruit@brightbiomethane.com>, Operator <operator@ormondeorganics.ie>
Subject: Minor emissions biogas upgrading unit

Dear Mr. Mullally,

Please find attached to this email the "Process and Technical Datasheet" for the biogas upgrading unit, installed by us at your side.

As discussed last week, and shown in the data sheet, we can conclude that the emissions from the biogas upgrading unit are Minor!
This due to the fact that the gas, which goes trough the installation, is clean and the off gas consist for more than 99% out of CO2.

Please don't hesitate to contact me if you have any more questions.

Best regards,

BRIGHT BIOMETHANE

Version: 4.3

PROCESS PARAMETERS

Ormonde Organics
B304 Waterford

STARTING POINTS:

Input:

Nominal Flow	500	Nm³/h
Biogas CH4% in	60	vol.%
Grid specification	CNG	

Minimal biogas flow	40%	of nominal flow
Efficiency ≥	99,5%	%CH_4 yield

PROCESS PARAMETERS:

	Biogas (in)	Gas requirement	Bright (output)	Off gas (output)	
Methane (CH_4)	60	97	97	0,8	vol.%
Nominal Flow	500	-	308	192	Nm³/h
Minimal Flow	200	-	123	77	Nm³/h

GAS COMPOSITIONS:

	Biogas (in)	Gas requirement	Bright (output)	Off gas (output) [1]	
Methane (CH_4)	55-65%	≥ 97	≥ 97	≤ 0,8	vol.%
Carbon dioxide (CO_2)	35-45%	≤ 3	≤ 3	≥ 99	vol.%
Nitrogen (N_2)	≤ 0,5	≤ 0,9	≤ 0,9	≤ 0,2	vol.%
Oxygen (O_2)	≤ 0,2	≤ 0,2	≤ 0,2	≤ 0,3	vol.%
Hydrogen sulfide (H_2S)	≤ 200	≤ 3	≤ 3	0	ppm

GAS CONDITIONS:

	Biogas (in)	Gas requirement	Bright (output)	Off gas (output)	
Higher heating value	-	-	38,64	-	MJ/Nm3
Pressure	1	8 - 16	250	1	bar
Temperature	40	5 - 35	10 - 35	10 - 35	°C
Dew point	40	-	≤ -50	-17	°C at 1 bar(a)

CONSUMABLES AND HEAT RECOVERY:

			Annual:	
Nominal electricity consumption	0,39	kWh / Nm³ biogas [1]	1665	MWh/year
Estimated activated carbon H2S at 200 ppm H2S	0,45	g / Nm³ biogas	1913	kg/year
Estimated activated carbon VOC at 50 mg VOC/Nm3	0,15	g / Nm³ biogas	638	kg/year
Heat recovery	0,15	kWh(th) / Nm³ biogas [2]	638	MWh(th)/year

Remarks and definitions

[1] Value at nominal flow

[2] Heat recovery from compressor oil cooling

Nm3 is defined at 1 atm and 0°C

Design environmental conditions: -20/+40°C

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Checked by: Kvo

Revision: 0
Printing date: 23/12/2021 12:28

BRIGHT BIOMETHANE

Version: 4.3

TECHNICAL PARAMETERS (Preliminary*)
PurePac C3

Ormonde Organics
B304 Waterford

STARTING POINTS:

Input:					
Biogas flow	500	Nm³/h	Minimal biogas flow	40%	of nominal flow
Biogas CH4% in	60	vol.%	Efficiency ≥	99,5%	$\%CH_4$ yield

PRELIMINARY MOTOR LIST

	INSTALLED POWER kW	CONTROL	MANUFACTURER(S)	Pabs,nom kW	Pabs,max kW
Compressor	165	VFD	Adicomp, CSH or equivalent	133	148
Blower	8	VFD	Meidinger/Mapro or equivalent	4	5
Chiller	25	Variable Controls	Carrier/Trane	10	25
Other (pumps, fans, air conditioning)	22	Variable Controls	Different Suppliers	4	22
Total	274			196	254

Utilities

Electrical connection	3Φ; 400V; 50 Hz
Compressed air	6 bar free of oil and water

Biogas Compressor Details

Brand	Adicomp / CSH / Bauer or Equivalent
Type of Compressor	Screw
Maximum Capacity**	497 Nm3/h

Upgrading Details**

Type of Upgrading	3-stage Membrane System
Type of Membrane	Evonik Sepuran Green
Membrane Size (including housing)	6inch - Housing = 1448 x 168.3 mm
Control System	Siemens S7 with HMI interface and connectible to SCADA
Motor control (VFD, soft starters)	ABB, Siemens or equivalent
Valves and fittings Suppliers	Econosto, Klinger or equivalent
Instrumentation Suppliers	E&H; Honeywell or equivalent
Analysers and Chromatographs	Pronova, ABB or equivalent

MATERIALS OF CONSTRUCTION

Biogas Piping	SS304
Active carbon vessels	HDPE
Utility Piping	Steel coated
Membrane Housing	SS316
Membrane Racks	Coated steel
Skids	Coated steel
Insulation Cladding	Aluminium

OTHER DETAILS

Painting	According to Bright Standard
Noise Emmissions	75 dBa at 1m
Condensate production	35 L/h

* Exact details will be determined at detail engineering.
** Maximum capacity of compressor at 100mbar inlet pressure, 35°C inlet temperature, 50% CH4 and a discharge pressure of 16 bar(g)
*** Condensate production based on 40°C saturated biogas cooled down to 2°C.

Made by: JKr
Checked by: Kvo

Revision: 0
Printing date: 23/12/2021 12:28

ATTACHMENT 3

7.4.2 EMISSIONS TO AIR

EPA Application Form

7.4.2 - Emissions to Atmosphere - Minor and Potential Emissions - Attachment

Organisation Name:	Ormonde Organics Ltd
Application I.D.:	LA007262

Amendments to this Application Form Attachment

Version No.	Date	Amendment since previous version	Reason
V.1.0	July 2017	N/A	Online application form attachment

Emissions to Atmosphere

Emissions to air/atmosphere include the following:

Main Emissions
Main emissions include all emissions of environmental significance. Where a **mass emission threshold** is specified in a BAT document (BAT Conclusions, National BAT note or BREF), emissions which exceed this threshold prior to abatement are regarded as significant, i.e., 'main emissions'. (In some cases emissions below the threshold can still be significant and qualify as Main Emissions).

Minor Emissions
Emissions below the mass emission threshold may be considered minor emissions and therefore do not generally need to be specifically controlled by the conditions or schedules of the licence (i.e., setting of ELVs, abatement control measures, or monitoring requirements). Emissions may also be deemed minor by virtue of their source/nature (e.g., laboratory fume hoods, workspace extractions, passive vents from storage tanks, HVAC exhausts), or composition (e.g., water vapour emissions).
For combustion plant such as boilers, these can be considered minor where the rated thermal input is < 1MW where natural gas is the main fuel, and for liquid and solid fuels where its < 250kW.

Fugitive Emissions
Fugitive emissions include emissions from non-point sources and diffuse sources.

Potential Emissions
These are emissions which only operate under abnormal process conditions. Typical examples include bursting discs, pressure relief valves, and emergency generators. Bypasses and flares may also fall within this category, depending on how they are operated or designed to operate. Although the Agency does not normally set controls in licences for potential emissions, it may do so for the purposes of environmental protection.

This attachment collects information on main and fugitive emissions to atmosphere. Waste gas means the final gaseous emission from a stack or abatement equipment.

For main and fugitive emissions to atmosphere, complete the separate '*Emissions to Atmosphere - Main* and *Fugitive Emissions'* attachment.

EMISSIONS TO ATMOSPHERE - Minor Emissions - one row per emission point

In completing this attachment for minor emissions, the applicant should supply sufficient information to justify the determination of the emission as minor. Notwithstanding the guidance provided on minor emissions, the Agency may consider any emission to be significant (i.e., a main emission) on the basis of environmental impact.

Complete the table below with summary details for all minor emission points to atmosphere.

Emission Point Code [(1)]	Easting [(2)]	Northing [(3)]	Description of source of emission(s)	Emission details [(4)]				Abatement system employed (if relevant)
				Parameter/ Material	mg/Nm^{3} [(5)]	kg/h	kg/year	
A3-1	247381	117968	Biogas Upgrade Unit	Carbon Dioxide				

(1) The following convention should be observed when labelling minor atmospheric emission points: A3-1, A3-2, A3-3,…etc.
(2) Six Digit GPS Irish National Grid Reference.
(3) Six Digit GPS Irish National Grid Reference.
(4) The maximum emission should be stated for each parameter emitted; the concentration should be based on the maximum 30 minute mean and must be the **PRE-ABATEMENT** level.
(5) Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0oC101.3kPa). Wet/dry should be clearly stated. Include reference oxygen conditions for combustion sources.

Emission Point Code [1]	Easting [2]	Northing [3]	Description of source of emission(s)	Emission details [4]				Abatement system employed (if relevant)
				Parameter/ Material	mg/Nm^3 [5]	kg/h	kg/year	

*add rows to the table as necessary

Note: Map(s)/drawing(s) uploaded under 'Site Plans' in Tab 3 of the application form should identify the emission and monitoring points.

EMISSIONS TO ATMOSPHERE – Potential Emissions to Atmosphere

Potential emissions are emissions that are not active under normal operation and would include by-passes or pressure relief valves.

Complete the table below with summary details of all potential emissions to atmosphere

Emission Point Code [6]	Description of source of emission	Malfunction which could cause an emission	Emission details (Potential max. emissions) [(7)]		
			Parameter/Material	mg/Nm^3	kg/hour

*add rows to the table as necessary

[6] The following convention should be observed when labelling potential atmospheric emission points: A4-1, A4-2, A4-3,…etc.

[7] Estimate the potential maximum emission for each malfunction identified.