Bioconstruct NewEnergy Limited

Bangley Quarry Biogas

Permit Application

PPC/A/5005379

Contents

1 Non-Technical Summary of Determination

Provide a non-technical summary of the process and determination

On 12 June 2023 SEPA received a Duly Made PPC Part A permit application, from Bioconstruct NewEnergy Limited, to operate an Anaerobic Digestion (AD) Gas to Grid plant, at Bangley Quarry Haddington EH41 3SP.
The size of the plant (100,000 Tonnes per year) combined with the use of waste feed materials means that the Activity will be regulated under the Pollution Prevention and Control (Scotland) Regulations for the Recovery of non-hazardous waste at by biological treatment using anaerobic digestion.

Location
The AD Plant is located within the former Bangley Quarry near Haddington in East Lothian (Grid Reference NT 488 752) and covers approximately 2ha of ground within a large quarry situated in a rural setting. The size of the quarry, and the location of the installation within it, means that it is not visible from outside of the quarry. The AD Plant is situated to the North of the main part of the former quarry, the excavation of which is now filled with water. Surveys of the area have been undertaken for both Planning and PPC Permit purposes, both surveys show that there are no sensitive receptors within a 250m-radius of the AD plant boundary.
Access to the installation is from the southwest via the C112 and A199 (a planning requirement).

Process
The site will accept both specifically grown and, where possible, locally sourced feed material (e.g. grass silage, hybrid rye, straw, and vegetable processing residues, together with a restricted list of biodegradable waste materials and by-products (e.g. brewery and distillery by-products, vegetable processing residues and other biodegradable wastes from local industry).
With the exceptions of biodegradable “green” waste under European Waste Catalogue codes EWC 20 02 01 “green” waste from gardens, parks, and cemeteries, and 20 03 02 “green” waste from markets, European Waste Catalogue Category 20 coded Municipal waste is not authorised to be accepted at the facility.
As a result, the company is keen to point out there will be no packaged wastes accepted at the site and hence there is no de-packaging of wastes, eliminating a major potential source of spill, odour, and vermin issues.

The use of a ‘just-in-time’ operational process means that the quantity of feedstock materials stored on site is kept to a minimum with most feedstocks stored off-site.
Regarding brewery and distillery by-products and other biodegradable wastes, these will be procured and delivered to the site when they are required by the digestion process.

Once the incoming loads have been weighed and approved to enter the site, vehicles carrying Solid Feedstocks will be directed to the “Reception Building” where they will be unloaded. This building is fitted with odour control systems, has an impermeable surface, and a sealed drainage system designed to direct potentially contaminated drainage to an on-site storage point where it is fed into the AD plant.

The approved loads will be mixed to give an optimal “feed” and treated using a fully controlled anaerobic digestion process. Once the treatment cycle is completed the materials produced by the activity will then be recovered.

The biogas produced will be stored in the head space of the tanks and flowing conversion to biomethane will be used in the on-site 999kW combined heat and power (CHP) engine and boiler, to produce heat and electricity for the process.
The excess gas produced will be cleaned by membrane separation to produce biomethane of a quality suitable for injection into national gas grid. Once the plant is operational the applicant has plans to recover the carbon dioxide produced during the gas purification stage for use in the food and drink industry
The digestate produced is envisaged to meet the British Standard Institution’s Publicly Available Specification (commonly referred to as PAS 110 standard), which makes it suitable and accredited for

reuse as a fertiliser/soil conditioner. Using an automated separation system, the digestate produced will be split into liquid and solid fractions. The liquid will be pumped to the sealed digestate storage tank for tanker collection with the solids stored for collection by farm trailers.

Environmental Concerns

The site is outside the relevant screening distance for any ecologically designated site, however Bangley Quarry is a designated geological site. As there are requirements under PPC/BAT for the installation of hardstanding, tanks, bunds, and drainage, which could have a direct impact on the geological feature of the SSSI Nature Scotland were contacted for any concerns they may have.

The main sensitive receptors are the domestic and commercial properties located between 250m and 500m from the Site boundary. As a result both odour /air emissions surveys and Noise emission surveys have been carried out. The modelling of air/odour and noise both indicate a minimum risk of impact from the proposed operations. The site has also produced Odour Management and Noise Management plans with requirements to investigate, and take reasonable steps, to address any issues should they arise.

The measures taken to minimise odours coming from the installation include the following:
Restrictions on waste types, the requirement that open-air handling of feedstocks will only take place within the reception building, the building has been fitted with odour extraction and a two-stage abatement system (UV light and carbon filtration) and is operated under negative pressure. Discharge and dispersion of treated emissions takes place via an odour stack. It is a site operational requirement that the doors to the reception building remain closed and only open for vehicle access/egress.

As the uncontrolled release of biogas can be both a fire and explosion risk a flaring device, with a non-visible flame, has been installed to allow the site to safely burn biogas in the event of plant failure or an emergency.

The AD tanks, along with the feedstock & digestate handling area, are all within a bunded impermeable surface.
Drainage from the site comprises two separate systems:

1. A surface water system for collection of rainwater run-off;
   and
2. A sealed process drainage system. where effluent emissions from the anaerobic digestion plant, gas treatment and Reception Building are redirected back into the AD process for treatment.

As a result, there are no direct discharges to water from the installation.

Additional Specified Waste Management Activity (SWMA) requirements
As a Specified Waste Management Activity (SWMA), Bioconstruct NewEnergy Ltd must comply with four additional regulatory requirements to ensure that an SWMA is operated correctly.
These require the Company to ensure that management and staff are both appropriately trained and Technically Competent to operate a SWM Installation. There must be a designated competent (COTC) person for the site. And there must be adequate Financial Provision available for the clean-up of the site should it close, in the case of the Bangley Quarry site, following extensive discussions between the Applicant and SEPA, a Company Guarantee has been provided by the French holding company of Bangley Quarry Biogas which has been accepted by SEPA.
Planning permission is in place for the site and was granted following a planning appeal. The appeal resulted in several conditions being placed on the operator by the Scottish Government planning reporter which impact on the activities which can be undertaken on the site.
SEPA has identified several planning conditions which impact on the waste activity and will permit the site with these “technical restrictions” in mind.
Finally, after a thorough review of a relevant convictions committed by Bioconstruct NewEnergy Ltd in England, SEPA considers it appropriate to treat the company as being a fit and proper person for the purposes of the Relevant Convictions check.

Best Available Techniques
The design, build and operation of the facility has been based on the Best Available Techniques as outlined in SEPA and EU Guidance covering the Activities carried out at the Site and is based on the requirements outlined in the relevant BREF Documents applicable to the Anaerobic Treatment of Waste.

Glossary of Terms

ABP -	Animal By-Products
AD -	Anaerobic Digestion
AEL -	Associated Emission Level
ALARP -	As Low as Reasonably Practicable
AQIA -	Air Quality Impact Assessment
AQMA -	Air Quality Management Area
AQO -	Air Quality Objective
BAT -	Best Available Techniques
BATc -	BAT Conclusions
BOD -	Biochemical Oxygen Demand
BREF -	BAT Reference Documents
BSI -	British Standards Institute
CAR -	The Water Environment (Controlled Activities) (Scotland) Regulations
CHP -	Combined Heat and Power
CIRIA -	Construction Industry Research and Information Association
CO -	Coordinating Officer
COD -	Chemical Oxygen Demand
COMAH -	Control of Major Accident Hazards
COTC -	Certificate of Technical Competence
DAA -	Directly Associated Activity
DEFRA -	Department for Environment Food and Rural Affairs
ELV -	Emission Limit Value
EMS -	Environmental Management System
EWC -	European Waste Catalogue
FOG -	Fats, Oil and Grease
GBR -	General Binding Rule
LGV -	Light Goods Vehicle
MCERTS -	Monitoring Certification Scheme
MCP -	Medium Combustion Plant
MCPD -	Medium Combustion Plant Directive

NMVOC -	Non-Methane Volatile Organic Compounds
NSR -	Noise Sensitive Receptor
OMP -	Odour Management Plan
OUE -	European Odour unit
PAS -	Publicly Available Specification
PG -	Process Guidance
PPC -	Pollution Prevention and Control
PRV -	Pressure Relief Valve
SCADA -	Supervisory Control and Data Acquisition
SPP -	Scottish Planning Policy
SSSI -	Sites of Special Scientific Interest
SWMA -	Specified Waste Management Activity
SWM -	Specified Waste Management
SWMA -	Specified Waste Management Activity
TVOC -	Total Volatile Organic Compounds
UKAS -	United Kingdom Accreditation Service
UV -	Ultraviolet
VFA -	Volatile Fatty Acids
VOC -	Volatile Organic Compound
WAMITAB -	Waste Management Training & Advisory Board.
WCA -	Wildlife and Countryside Act

2 External Consultation and SEPA's response

Guidance:
In general Public Consultation, PPC Statutory Consultation and the Public Participation Process is required if you are processing a new permit or a substantial variation to a permit. Further information on this is provided in the interim procedure for the Part A process that you are determining.

Is Public Consultation Required? (if no delete rows below)	**Yes**

Advertisement Check:	**Date**	**Compliance with advertising requirements**
East Lothian Courier	**13/07/2023**	**Fully Complies**
Edinburgh Gazette	**21/07/2023**	**Fully Complies**

Officer Checking advert: Martyn Howie

No of responses received	None

Summary of responses and how they were taken into account during the determination:

No Responses Received

Summary of responses withheld from the public register on request and how they were taken into account during the determination:

No Responses Received

Is PPC Statutory Consultation Required? (if no delete rows below)	**Yes**

Food Standards Agency:	Food Standards Agency: No Response received
Health Board:	NHS Lothian No Response Received
Local Authority	East Lothian Council No Response Received

Scottish Water	N/A
Health and Safety Executive	HSE: (application notified as a lower tier COMAH site) No response Received
NatureScot	Nature Scotland: Were contacted due to the Bangley Quarry site being a triple SSSI (for mineralogy) due to the requirement under PPC Part A to install impervious areas, containment, and drainage systems which could impact the geology The following comments were received *The only protected areas in the vicinity of this proposal are Bangley Quarry SSSI and Garleton Hills SSSI (around 1.5km from the proposal). However, since both SSSIs are notified for geological interest only, we have no comments regarding air pollution impacts of this proposal regarding protected areas.*

Discretionary Consultation required?	**No**
Enhanced SEPA Consultation required?	**No**
"Off-site" consultation required	**No**
Transboundary Consultation required?	**No**
Is Public Participation Consultation Required? (if yes provide justification and details below, otherwise delete rows below)	**Yes**

STATEMENT ON THE PUBLIC PARTICIPATION PROCESS

The Pollution Prevention and Control (Public participation)(Scotland) Regulations 2005 requires that SEPA's draft determination of this application be placed on SEPA's website and public register and be subject to 28 days' public consultation. The dates between which this consultation took place, the number of representations received and SEPA's response to these are outlined below.

Date SEPA notified applicant of draft determination	19/02/2024
Date draft determination placed on SEPA's Website	19/02/2024
Details of any other 'appropriate means' used to advertise the draft. Seek advice from the communication department	None
Date public consultation on draft permit opened	19/02/2024
Date public consultation on draft permit consultation closed	
Number of representations received to the consultation	
Date final determination placed on the SEPA's Website	

Summary of responses and how they were taken into account during the determination:

Summary of responses withheld from the public register on request and how they were taken into account during the determination:

REMOVE THIS BOX FROM ANY VERSION OF THIS DOCUMENT TO BE PLACED ON THE WEBSITE OR PUBLIC REGISTER. RETAIN IN THE VERSION FOR THE WORKING FILE.

Officer:	MH

3 Administrative determinations
Determination of the Schedule 1 Activity
As detailed in the application (*MCP determination excluded below 1MW)*
Determination of the Stationary Technical Unit to be permitted
As detailed in the application
Determination of Directly Associated Activities
As detailed in the application
Determination of Site Boundary
As detailed in the plans submitted with the application
Officer: MH

4 Introduction and Background

4.1 Historical Background to the activity

History of Bangley Quarry

The historical information provided by the applicant showed that between 1855 and 1954 the land use was agricultural with quarrying taking place in the Southern area In 1954 quarry workings were extended to the west and in 1965 a map showed that the quarry contained a pond a few buildings had been built on the site. In 1988 the site was extended and turned over to quarrying such that by 2002 the entire area of the new development was within the confines of the enlarged Quarry and contained buildings and stockpile areas associated with the quarry. Quarrying at the site continued up until 2018 when the quarrying was abandoned such that all that was left on site were a few concrete bases and small stockpiles of crushed stone. By 2021 the main features on the site were described a “cliff” to the North (the former quarry face), a pond to the south (caused by water collecting in the deeper quarry excavations) and an area of gravel hardstanding

Previous Environmental Licences

Information provided by the applicant has identified that planning permission for an aggregate recycling facility at Bangley Quarry was granted to Tarmac Ltd in December 2004. A check by SEPA failed to identify any authorisation for the site, however this information may have been lost in the cyber-attack of December 2020. The planning permission states that the main issue for SEPA was likely to be dust and that the materials were to be used to restore the Quarry. It is therefore likely such an activity would be subject to either PPC Part B and/or waste management exemption control.

The wastes approved to be recycled at the site are listed as: -

Construction and demolition wastes, Utility waste arisings from trench excavations, Asphalt based road plannings, Used railway ballast, Colliery spoil, Power station and Incinerator ashes, Blast furnace and steel slags and Foundry sands.

The applicant reports that it is not known how long the site was used as an Aggregate Recycling Facility, however all aggregate recycling stockpiles have since been removed from site. This activity has been accounted for in the site and Baseline Report produced as part of the application for this PPC Part A permit.

Planning Permission

Following appeal, planning permission was granted for the anaerobic digestion plant at Bangley Quarry with several conditions attached which have a direct impact on the operations which can be undertaken at the site.
Two of the key planning conditions are that the capacity of the plant shall not exceed 100,000 tonnes per annum, and that waste accepted at the site must not include the delivery, acceptance, or treatment, of Municipal Waste.
Clarification provided by the applicant during the permit determination outlined that it was their intention to process waste vegetable material from agriculture, materials from brewery/distilleries, and Green Waste. This is in line with the restriction on the waste types within the planning permission which restricts virtually all European Waste Catalogue Code 20 wastes, primarily to prohibit the site from taking in packaged pre-processed food waste and food wastes from households and catering establishments.
The only wastes which can be accepted under EWC Code 20 are EWC Code 20 02 01 biodegradable waste from gardens, parks, and cemeteries, and EWC Code 20 03 02 biodegradable waste from markets, as these are similar in nature to the feed crops and wastes collected from farms and agricultural holdings. No other category 20 waste is permitted to be accepted on the site.

The operator has applied to handle up to a maximum 100,000 Tonnes of waste per year which calculates as an average of approximately 273 Tonnes per day on a Calendar year. The 'just in time' method of operation, combined with the utilisation of industrial feed crops, means that although the site is permitted to treat 100,000 tonnes of waste per annum a proportion of the feedstock will be non-waste materials. The applicant has provided details outlining that the mode of operation means that the amount of waste on site at any time will be approximately 952 Tonnes.

SEPA Licensing
The figure of 273 Tonnes per day capacity outlined in the planning permission is above the threshold that requires regulation as an activity under the Pollution Prevention and Control Regulations. As a result, the applicant began pre-application discussions regarding the licensing requirements for the Bangley Quarry AD plant.
The size/capacity of the plant is such that an application was required to be made under Section 5.4 Part A (b) (i) of the PPC 2012 Regulations covering "Recovery of non-hazardous waste by biological treatment". (The regulations state a permit is required for anaerobic digestion if the installation capacity exceeding 100 tonnes per day).

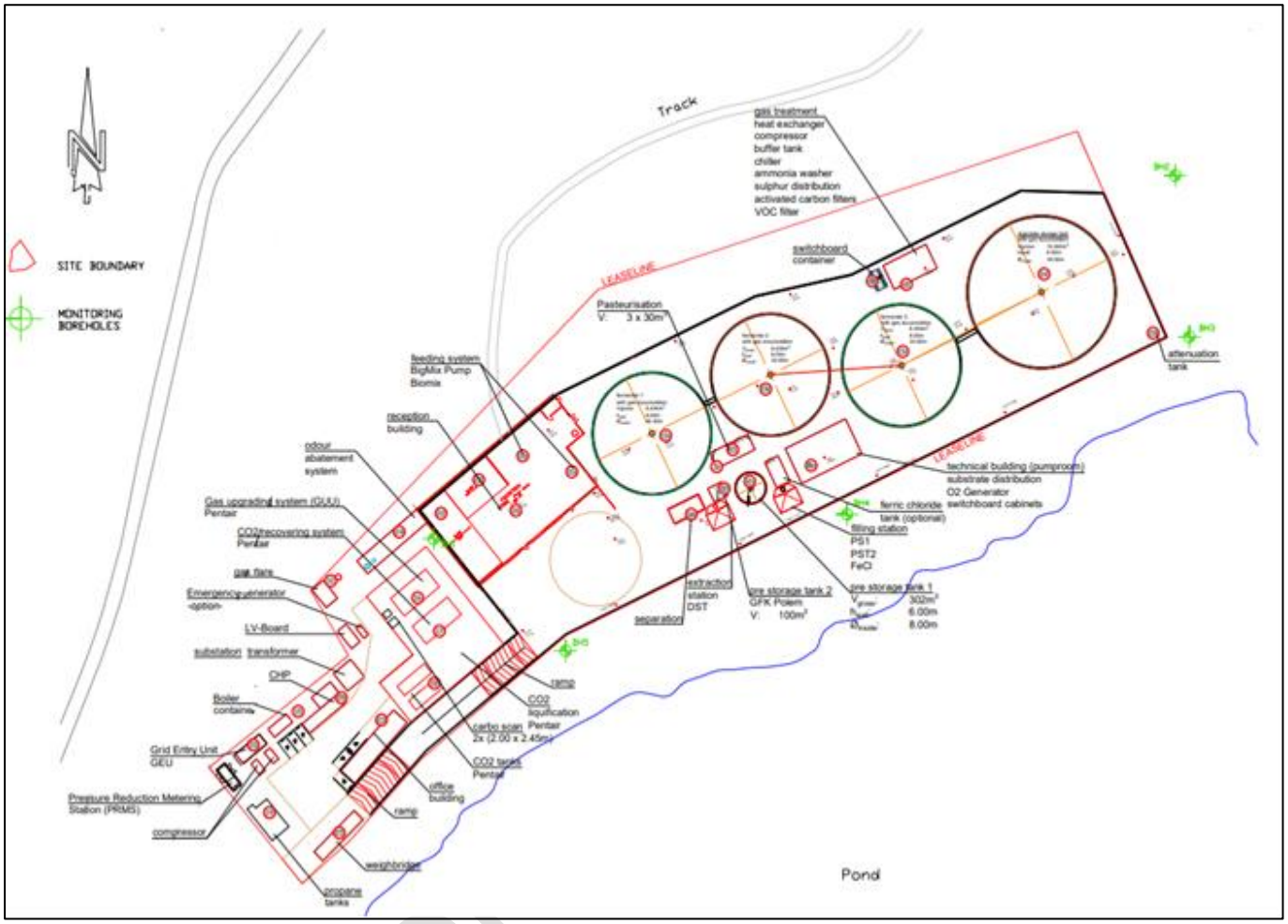
On 12 June 2023 SEPA received a Duly Made PPC Part A permit application from Bioconstruct NewEnergy Limited, to operate an Anaerobic Digestion (AD) Gas to Grid plant, at Bangley Quarry Haddington EH41 3SP.

The PPC 2012 Regulations provide that SEPA must, on receiving a duly made application for a permit, either grant a permit subject to the requirements of the legislation or refuse the application. SEPA is required to determine whether the measures proposed by the applicant are sufficient to protect human health and the environment.
The following report reviews the measures proposed by the Applicant in terms of the current BAT standards, guidance, and Industry benchmarks for Anaerobic Digestion. Where an Emission Limit Value is required, assessment has been made on whether the operator can meet the standard or whether further measures are required to be implemented before a permit can be granted.

Current Application
The current PPC Part A application covers the installation shown in the site plan below.
The site is located within the former Bangley Quarry, a large quarry situated in a rural setting outside of Haddington in East Lothian (Grid Reference NT 488 752). The size of the quarry and the location of the installation within it means that it is fully contained and will not be visible from the outside of the quarry.

The site of the installation covers approximately 2ha of ground within Bangley Quarry, on what is described as "the western flank of a topographic high point". It is positioned between the main quarry excavation (now filled with water) to the South, and the rock cliff forming the former quarry face to the North. The ground on which the present installation is built previously contained some of the original quarry buildings which were

removed prior to construction following which the ground was subjected to some limited profiling work. As such, the installation site is flat lying at around 110mOD with a ground surface that rises to around 116mOD at the Eastern boundary of the site and to approx. 126mOD to the northwest. Access to the installation in the southwest is at 108mOD.



The site is not within the relevant screening distance for any ecologically designated site, however Bangley Quarry is a designated geological site. As there are requirements under PPC/BAT for the installation of hardstanding, tanks, bunds, and drainage, which could have a direct impact on the geological feature of the SSSI, Nature Scotland were contacted regarding any concerns they may have.

The survey of the area of the quarry, provided by the applicant, shows that the quarry is situated in an agricultural area with a low population density. The survey identified that there are currently no domestic, commercial properties, or other sensitive receptors, within a 250m radius of the AD plant boundary. Most of the potentially sensitive receptors are located between 250m and 500m from the Site boundary. Odour, Air emissions, and Noise surveys have been carried out in the vicinity of the receptor sites and modelling tools have been used to identify any potential issues. The results of these are summarised in the relevant sections below.

4.2 Description of activity

The use of waste in the feed material means that the Activity falls under Section 5.4 Part A (b) (i) of the Pollution Prevention and Control (Scotland) Regulations: Recovery of non-hazardous waste at an installation with a capacity exceeding 100 tonnes per day if the only waste treatment activity is anaerobic digestion by biological treatment.
The activity carried out at Bangley quarry consists of the anaerobic digestion of energy crops, agricultural wastes (e.g. grass silage, hybrid rye, straw, and vegetable processing residues), and brewery and distillery

by-products. It is the intention of the operator to source these materials locally wherever possible (local farms, agricultural markets, and other biodegradable wastes from local industry).

The acceptance of European Waste Catalogue (EWC) Category 20 coded wastes (described as *"Municipal Wastes (Household Waste and Similar Commercial, Industrial and Institutional Wastes) Including Separately Collected Fractions"* is restricted under the planning requirement for the site. Aside from biodegradable waste from gardens, parks, and cemeteries (EWC Code 20 02 01) and biodegradable waste from markets (EWC Code 20 03 02), no other category 20 waste is permitted to be accepted on the site. The result of this restriction is that there will be no packaged wastes accepted at the site, removing the necessity for a depackaging (pre-treatment) stage and reducing the risk of spill, odour, and vermin, at the site.

The site will use a 'just-in-time' mode of operation. This means that the quantity of feedstock materials stored on site will be kept to a minimum, with most feedstocks stored off-site, e.g. in clamps on the farms where they were grown. Brewery and distillery by-products and other biodegradable wastes will be delivered to the site when they are required by the digestion process.

Feedstocks will be delivered to the site using a variety of road vehicles dependent on the materials being delivered. It is a requirement of the planning permission for the site that any vehicle carrying Animal by-product materials must be covered.

On arrival, all vehicles entering the site will pass over the weighbridge where they will be checked and if necessary, tested. Should the materials be deemed unsuitable for use in the process they will be rejected and SEPA will be notified.
Once approved to enter the site, vehicles carrying Solid Feedstocks will be directed to the odour controlled, and negative pressure, "Reception Building" where they will be unloaded into the clamps. From the clamps the material is transported, using an in-house loader vehicle, to one of two feed hoppers situated within the same building.
Tankers carrying liquid feedstocks, will be directed to unload into one of two sealed and bunded import tanks (the buffer or GRP import tank) after which the contents will be fed directly into the sealed AD plant.
In terms of pre-processing the only activity carried out on site will be the mixing of import materials and return effluents, a process where the conditioned solids from the feed system, liquid feedstocks from the import tanks, and recirculated material and water from the AD process, are blended to produce an optimal feed material for feeding into one of three concrete tanks where the Anaerobic Digestion (AD) process occurs.
The concrete digester tanks are fitted with rotating paddles and submersed propellers to ensure correct mixing and temperature control to ensure process efficiency.
The whole process is monitored such that, when necessary, a mixture of liquids can be added to vary the viscosity and enhance mixing.

The Biogas produced during the AD process is collected in an integrated biogas holder located within the double membrane dome of the digester. This is adjustable to allow for changes in the volume of gas produced by the AD process. The collected biogas is then drawn off with some used (following conversion to Biomethane) in a combined heat and power plant (CHP) comprising a gas engine (rated below 1MW), and a backup boiler rated 1100kW. These will produce heat and electricity, or in emergency heat to power the site. The remaining biogas is transferred to a Pentair Biogas treatment system comprising of a Membrane Separation process which removes impurities from the biogas to produce biomethane suitable for injection into the gas grid. The Pentair system can be retrofitted with a CO_2 recovery system when required.

As methane gas is extremely flammable, an emergency gas flare has been installed which can burn biogas produced above the plant's max capacity and allows for any excess biogas produced to be diverted to the flare and safely burnt e.g. in event of the biomethane plant being out of operation and the storage in the gas domes full.

The material left over from the AD process is known as digestate. The digestate produced from Bangley Quarry is expected to meet the British Standard Institution's Publicly Available Specification (commonly referred to as PAS 110 standard), which makes it suitable, and accredited, for reuse as a fertiliser/soil conditioner.
In the case of Bangley Quarry, the digestate produced will be pasteurised (held at >70C for 1 hour) and certified as PAS 110, following which an automated separation system will separate the digestate into liquid and solid fractions. The liquid will be pumped to the sealed digestate storage tank and the solids collected by farm trailers daily.

4.3 Guidance/directions issued to SEPA by the Scottish Ministers under Reg.60 or 61.

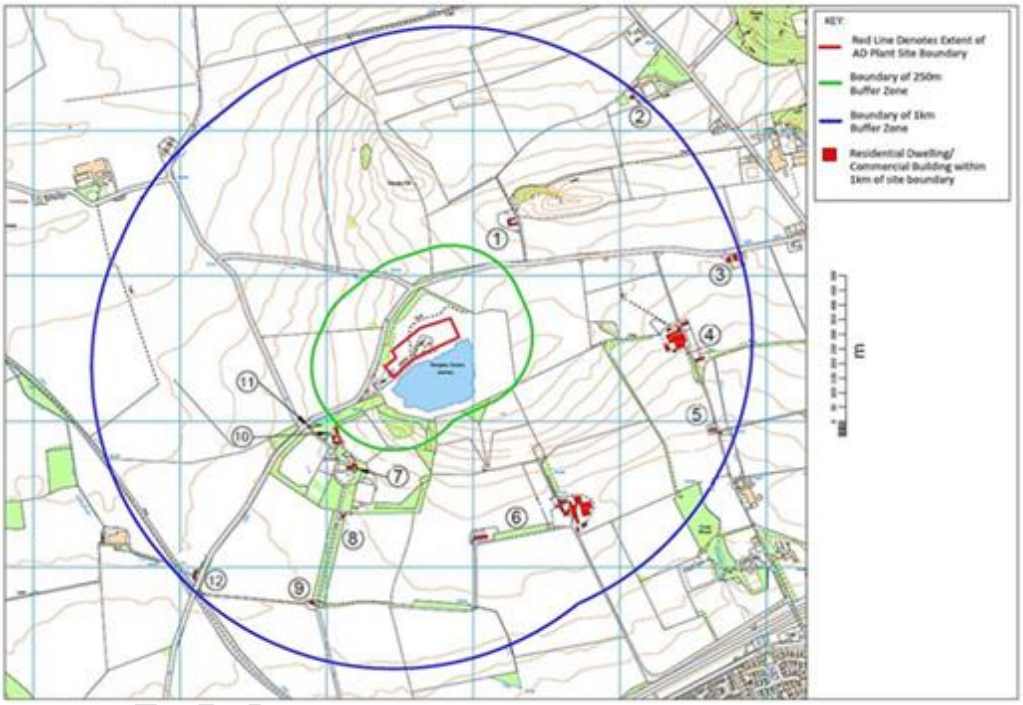
None

4.4 Identification of important and sensitive receptors

The site comprises an approximately 2 hectares brownfield site within the pre-existing Bangley Quarry situated in a rural location North of Haddington, East Lothian (Grid Ref; NT 488 752)

Nearby noise and odour sensitive receptors have been identified and are shown on the plan below. Modelling studies have been carried out by the applicant's consultants, and the reports submitted to SEPA within the supporting information for this application. They are discussed in the relevant sections of this report below.

Receptors and 250m Buffer Zone



Summary
< 250m: No sensitive receptors identified
>250m and <500m: 4 located to the Southwest (closest 256m) and 1 to the Northeast (374m)
>500m and >=1 km: 7 located on an arc from NE to SW of the site

With exception of landfill and incineration the Nature Conservation Protocol screening distance for Waste disposal and recovery is 2km.
No Nature Scotland environmentally designated sites were identified within a 2 km radius of Bangley Quarry

Additional Screening carried out for the combustion activity using the MCP "proximity screening tool" for a Combustion plant of less than 1MW showed no designated sites within the relevant screening distance

Assessment using figures for the emergency use of the back-up boiler did not alter the result of the screening assessment.	
Officer:	MH

5 Key Environmental Issues

5.1 Summary of significant environmental impacts

SEPA has identified several significant environmental impacts associated with the AD process and its Directly Associated combustion Activities. These are identified, as follows:

Emissions to Air	Odour, Ammonia, H_2S, NOx, COx, SOx, NMVOC's, Methane and Bioaerosol
Emissions to Land	PAS110 Solids, non PAS110 solids
Emissions to Water	Surface water run-off
Other Emissions	Heat, Noise, and vehicle exhaust fumes

SEPA will control the impact through both the Permit conditions and by the requirement on the Operator to use BAT as indicated in the relevant guidance for the activities.

For the Bangley Quarry Biogas reference has been made to the following documents:
'BREF and associated BAT Conclusions for Waste Treatment (10/08/2018)'
'SEPA PPC Technical Guidance Note 38';
'SEPA Guidance and Control of Noise at PPC Installations (April 2015)';
'SEPA Noise: Summary Guidance for PPC Applicants (June 2015)' and
'SEPA Odour Guidance (January 2010)';
2016 Common Waste Water and Waste Gas Treatment BREF

5.2 Emissions to Air

Point Source emission to air:

Summary
There are a limited number of point source emissions from the site. The most significant are likely to be from the odour stack and the CHP plant, most other systems are safety systems which will only operate during accidents, incident, or emergencies.
The Waste Treatment BAT Reference Document (WT BREF) reports that the air emissions most monitored from the Anaerobic Digestion Plant (AD Plant) operation are: NH3, Non-Methane Volatile Organic Compounds (NMVOC), and Odour, adding that where biogas combustion occurs air emissions may also include SO_X, NO_X, CO_X, the latter not being within the scope of the WT BREF

The main Point source emissions to air from the Bangley Quarry AD plant are summarised as follows:

CHP Plant
As noted earlier, the on-site CHP on site is below 1MW and is below the regulatory threshold of the Medium Combustion Plant Directive (MCPD). As the activity falls within the Part A permitted installation, and the CHP plant has a direct technical connection, SEPA will require the operator to use BAT in the operation of the plant and will require the plant to meet standards for key pollutants, but not the full requirements of the MCPD. These will be set at the operating levels provided by the manufacturer of the combustion unit.
As a combustion process the key pollutants emitted will be Sulphur Dioxide (SO_2), Nitrogen Oxides (NOx), Carbon Monoxide (CO), there will also be a Carbon Dioxide (CO_2) load. The inclusion of the combustion plant within the Part A permit will require the Operator to meet the general odour and emission conditions placed on the site and this requirement may require the Operator to increase the parameters that need to be monitored from the CHP.
In the event of a fault or failure of the main gas engine, a back-Up Boiler is provided with a rating of 1100 kW and having a maximum thermal input rating of 1196kW. This suggests that this boiler will fall under the Medium Combustion Plant regulatory requirements. The manufacturers figure is however based on the use of Natural Gas as the fuel source, whereas this boiler will operate using biomethane as fuel,

which as industry experts and the UK government (DUKES) figures show, has a much lower calorific value. (natural gas is between 35-36.5 MJ/m3 and AD (biogas) 19-24 MJ/m3 (DUKES))

The MCP regulations apply to combustion plant with a rated thermal input greater than 1MW, which according to the standard definition (in italics below) requires that the calorific value of the fuel be taken into consideration.

Net rated thermal input means the rate at which fuel can be burned at the maximum continuous rating of the appliance, multiplied by the net calorific value of the fuel and expressed as megawatts thermal.

The figures for the 1100kW rated boiler installed are calculated on the maximum combustion rate of Natural gas, which as shown in the table above, has a much higher calorific value. Given that the maximum throughput and burner rate are fixed then the actual net thermal input of the installed boiler using biomethane as fuel is less than 1MW.

The applicant has identified that the boiler is less efficient than the Gas engine and it will only be used as a back-up. Given its manufacturer rating if operated, serviced, and maintained correctly, then it is fully MCP compliant. As it is operating on a Part A site then SEPA expect the operator, as a minimum, to achieve the emissions standards provided by the manufacturer for the boiler (below).

Pollutant	**ELV (Normal Temp and Pressure 3% O_2)**	**Extractive Monitoring Requirements**	**Continuous Monitoring Requirements**
NO_x	100mg/m^3	Minimum annually with option to reduce dependent on risk and consistent compliance	None
CO	10mg/m3	Minimum annually with option to reduce dependent on risk and consistent compliance	Yes, continually monitor Combustion efficiency
SO_2	35mg/m3	Minimum annually with option to reduce dependent on risk and consistent compliance	May be provided (No BAT requirement)
H_2S	5ppm at outlet and specify maximum concentration which can be combusted at inlet dependent on risk identified via modelling	Minimum annually with option to reduce dependent on risk and consistent compliance	Yes, continually monitor Inlet Concentration

Combustion gases,
A review of baseline air quality in the locality of the Site shows that the site was not located within an AQMA or known air quality area of concern (the nearest Air Quality Management Area (AQMA) is located 15km away)
The closest air monitoring point to the Quarry is Lyn Lea, Haddington, 3.7km from the site which is monitored non-continuously.
The available background data indicates that there were no background exceedances of the relevant air quality objectives (AQOs) within the vicinity of the site during 2022.

The air quality reports referenced in the application state that the consultants used the NO_2 background concentration of 6.0 µg/m^3, (Lyn Lea, Haddington 2021), and a maximum CO background concentration of 77.1 µg/m^3 to produce a worst-case scenario for the assessment of impacts at human receptors.

Odour Control System (OCS)
The Odour Control System comprises a two-stage Exeon abatement system consisting of a UV "reactor" followed by an active carbon filter discharging to a 14m high stack.

Air is extracted from the negative pressure reception building and passes through the two-stage system prior to discharge through the stack. The design of the reception building and the air extraction system (providing at least 3 air changes per hour) creates a negative pressure environment within the building such that all air within the building is passed to the abatement system.

The applicant has modelled odour emission from the site, including the abated emissions from the stack, reporting that *"levels of odour achieved using this treatment are well under the levels that should cause nuisance."* This is described in the Odour modelling Report and Odour Assessment documents.
(SEPA's discussion of the environmental odour assessment is contained under the heading "Odour" below)

Selection of the Odour Control System (OCS)
The applicant has selected a two-stage odour abatement system. The use of two treatment technologies "in series" is stated as giving "additional odour elimination" over and above that achieved by using just one technology (e.g. biological treatment)

The use of UV light to breakdown pollutants (e.g. Volatile Organic Compounds etc) is a recognised treatment method (listed under Chemical Oxidation).

The technology has a small physical footprint which at a site with limited space is a distinct advantage (No pipes, pumps, storage containers etc. are required).
UV treatment requires little water usage, and its use does not require regular adjustment which some biological treatment systems require to maintain optimum efficiency
It is well suited for use in air abatement treatment and gives consistent and reliable results.
It has a lower operational maintenance requirement than other abatement systems requiring only a stable electricity supply and bulb monitoring, cleaning, and replacement.

Unlike other abatement systems UV light disinfects the air thereby reducing the risks associated with any bioaerosol produced.

The use of Active Carbon Filtration is a well-established method of Odour treatment either on its own or in conjunction with other systems.

The Active Carbon filter as part of a commercial unit has been appropriately sized. Active Carbon filtration is widely used in air abatement treatment systems being proven to give consistent and reliable pollutant removal results.
Its operation is simple and straightforward, requiring no adjustment, additional chemical, or water input.
Periodic monitoring of the filter is required (to check on removal efficiency) with maintenance being minimal.

The main requirement for this method is a stable electricity supply to power associated fans and access to replacement Active Carbon filter material.

The applicant outlines that in choosing this combination of technologies they considered that it presents several additional advantages:

The use of these two distinct methodologies in combination is suitable for stable operation during periods of high/low, or fluctuating, odour concentrations, (useful given the variety of the feedstocks which will be processed within the process building). Both systems require no chemical input or heat and little in the way of process.
The system is flexible and easily expanded by adding more carbon blocks and UV lamps making it possible to vary with the sites requirements.
Pre filter and UV treatment means the main Active Carbon filter will last longer than an analogous Active Carbon filter on its own due to the excess ozone generated by the UV lamps which helps to destroy organic compounds which would otherwise be captured on the carbon filter.

In conclusion the applicant states that *"The combination of these two technologies provides high performance with competitive operational costs and requirements"*

Whilst detailing the reasons why the Odour Control system was chosen the applicant alludes to the other odour abatements systems available and why they were discounted

Activated Carbon (Only)
As stated above AC Filtration is a recognised form of treatment, however, the use of an AC filter on its own requires more frequent replacement (shorter operating life), and closer monitoring, leading to a rise in operating costs, literature suggests there is a poor w/v take up rate for VOC's.

Bio-Filtration
The size of the filter bed required to treat the air emissions from the site makes the technique not viable given the size and configuration of the site. The Applicant indicates that the need to use water, chemicals and the subsequent contaminated water disposal, were also considered.
A main consideration in arriving at the chosen abatement system was its ability to handle fluctuations in load. Reports indicate that biofilters operate best under stable flow and load conditions which allow bacteria to operate effectively. This makes Bio-Filtration incompatible with the expected operational conditions of the AD plant.

High-Rate Scrubbers
The Applicant identifies that there is a need to avoid techniques using water and chemicals as there are limited methods for the disposal of contaminated water. Literature studies indicate that although they are good for removing water soluble compounds, e.g. Ammonia, they are not effective at removing non-water-soluble VOC's.

Chemical Scrubbing
The Applicant identifies that there is a need to avoid techniques using water and chemicals as there are limited methods for the disposal of contaminated water. Although utilising less physical space than the biofilters, literature studies indicate that although they are good for removing compounds such as H_2S they are not very effective at removing non-water-soluble VOC's and were ruled out on those grounds.

Odour Control System (OCS) Monitoring & Maintenance
Performance Monitoring of the carbon filters will be undertaken bi-annually by assessment using analytical monitoring conducted to MCERTs and UKAS accreditation.
The operating procedure requires daily checks by staff on the condition of the odour abatement equipment (carbon filter, UV bulbs, etc). Procedures are in place to process monitor using SCADA diagnostics, handheld devices, and the use of Drager tubes as common practise.

A prescribed system of maintenance will be carried out based on the manufacturer's recommendations and will include the following key elements:

Inspection of lamps and ballasts.
Functional inspection of over- under pressure switch & safety systems.
Visual inspection on the state of the carbon.
Check of fan wheel balance, bearings & seals.

Efficiency testing on extraction and flows.
Measurement of gases relevant for the odour emissions

OCS Stack height

The initial modelling data and reports submitted were reviewed by the SEPA Air modelling section and several queries were raised including the lack of a stack height sensitivity analysis. These issues were raised with the applicant and addresses through an additional air modelling report submitted in October 2023

The OCS stack height assessment submitted in the Air Quality Assessment for PPC Permit Application 784-B023850, submitted 5th October 2023, considered several potential stack heights with intervals of 2m between 10 and 20m. The results showed that there were small-scale decreases in the predicted maximum odour concentrations at the closest residential receptor with the slope of the '% Odour PC to the Odour Criteria' vs 'Odour Stack Height' curve presenting with the percentage changes in odour process concentrations at the maximum residential receptor location determined to be 22.08% to 43.29% at different stack heights.
The predicted short-term odour emissions from the site are shown to be acceptable at any of the assessed stack heights.
As the Air Quality Assessment shows that the OCS stack height provides sufficient dispersion to be unlikely to have a significant impact upon sensitive receptors, then the BAT issue becomes one of whether the height above the process building is sufficient to facilitate dispersion and minimise the effects of any drawdown.

OCS height was not agreed with SEPA at planning stage (unlike the CHP stack which is recorded in the planning documents as having been agreed)

The operator in their submission has stated that a height of 14m is above the ridge roof height of the process building (13.5m) and that although increasing the heights of the stack could result in a marginal improvement to air quality that it would result in the following adverse impacts, which it is inferred would outweigh those benefits:

Additional visual impact, and potential regulatory implications regarding planning permission

A review of the Planning Officer's report prepared by East Lothian Council planning department was carried out (public document accessed under reference 17/00922/P: Erection of an anaerobic digestion (AD) plant, ancillary equipment, on-site infrastructure and associated works at Bangley Quarry, Huntington, Haddington East Lothian EH41 3SN).
The Officer identifies that visual impact and visibility of the site was a significant factor and that the quarry afforded screening of the plant. One of the conditions attached to the Planning permission is a scheme of landscaping by the form of the provision of a tree and shrub planted earth bund to the north of the entrance which has been specifically added "In the interests of landscape character and the visual amenity of the area"

The applicant also highlights a few engineering issues which would result in significant additional capital investment including a full review, and changes, to the site wide site lightning protection system, with additional maintenance costs and energy requirements

Any increase in height of the OC stack would increase the visibility of the plant. The stack has been described as approximately 20m away from the process building (the original source of the emissions). This building is designed to draw air in and prevent emissions and is fitted with a highly efficient air extraction system designed to remove any odour within the building. The applicant has detailed that where access to the Process building roof was required a risk assessment would be undertaken, however it is not envisaged the OCU would be required to be switched off (i.e. to prevent exposure to emissions) for work to be carried out as the closest point on roof is approx. 20m away from the stack.

As a result, SEPA accepts that the proposed stack height of 14m is acceptable for the OCS Stack

Biogas upgrade vents
The main product released to atmosphere from the vents during Biomethane production is CO_2 which is generated in the Pentair system. The CO_2 recovery system fitted at the Bangley Quarry Biogas Plant will significantly reduce the need for CO_2 release to atmosphere, all other gaseous products will be trapped by the gas cleaning system. Low grade gases (those which cannot be combusted), may, for a short period, require to be vented to atmosphere e.g. during commissioning. The volume of any gas vented and the duration of venting will be minimised to be as low as practicable.

Pressure Relief Valves (PRV).
Monitoring and control systems have been fitted to the AD process to restrict the operation of the PRVs in all but extreme emergency situations e.g. to prevent over pressurisation of the digesters.
The use of an oxygen injection abatement system specifically to reduce H_2S in the biogas means that odour related to emergency venting of biogas is significantly reduced, thereby minimising the potential impact on sensitive receptors.

Flare
An NER standard, emergency auxiliary, flare has been fitted to facilitate safe handling and combustion of the biogas (with no visible flame) in the event of any plant failure. The flare has been designed to accommodate the maximum flow rate during plant breakdown.
The flare will burn at a minimum temperature of 1000°C and will be monitored using an Ultraviolet (UV) sensor and a thermocouple, linked to an automated control system which adjusts to deliver enough air to the system to maintain a compliant temperature of 1000°C - 1100°C with a retention time of 0.3s. Should the combustion temperature drop below 1000°C then an alarm is triggered. The technical details below are summarised from information provided by the Flare supplier (Uniflare Ltd)

Design Flow – Biogas	**400 - 1750**	**Nm3hr (Variable)**
Design Flow – Biomethane	**185 - 950**	**Nm3hr**
Maximum design emissions Normalised at 0°C, 101.3 k Pa and 3% O2:	Carbon monoxide (CO)	50 mg Nm-3
	Oxides of nitrogen (NOx)	150 mg Nm-3
	Total volatile organic carbon as carbon	10 mg Nm-3
	Non-methane volatile organic carbon	5 mg Nm-3
Operation	Unattended Intermittent use	
Design Combustion temperature	Combustion >1000°C Fully refractory line with automated combustion control	
Minimum retention time	> 0.3 seconds	

The BAT Reference Document for Waste Treatment provides the following information regarding operation of elevated flares and warns against using the emission limits within a permit, they do however provide a benchmark as to the average levels of pollutants achievable.

Combustion Temperature >800°C
Flare Velocity 0 - 20m/s

VOCs >98% Abatement Efficiency
NO_x (Emission Level) 400mg/Nm^3 (200ppm)
CO (Emission Level) 588 mg/Nm3

The use of the flare will be restricted to emergency use only and be controlled through Permit Conditions.

BAT is that the emissions from the flare stack will be minimised using a correctly designed stack. The flare will burn at a minimum temperature of 1000°C to ensure that the combustion process is complete. The flame in the flare stack is monitored by an Ultraviolet (UV) sensor and a thermocouple. The UV sensor provides a flame present signal to the control panel and the thermocouple provides a flame temperature signal to the control panel to control an actuated louver to deliver enough air to the system to maintain a compliant temperature of 1000°C – 1100°C with a retention time of 0.3s to ensure complete combustion. A flashback arrestor has also been fitted.
Combustion temperature will be continuously monitored so there will be an alarm if the temperature drops below 1000C.
The details of the flare installed are comparable to those outlined in the Waste Treatment BREF and the controls fitted are deemed to meet BAT with respect to the flare.

AD Plant
The AD process produces gaseous and potentially odorous emissions. The sites AD process has been designed and built such that the process is carried out within fully enclosed vessels which under normal operation negate releases to air. The only point source discharge from the digesters are the PRVs which are required to be fitted as part of the pressure vessel safety system (see PRV sub heading for further details).

BAT Assessment
Point source or channelled emissions to air are describe in the following BAT Conclusions
General BATc: 1, 8, 10, 12, 13, 15, 16,
Biological Treatment BATc 33, 34, and Table 6.7
Anaerobic Digestion BATc 38

The entries referring to Dust and TVOC monitoring within the Table in BATc 8 do not apply to Biological Treatment (column 4) such that where these are collected, channelled, and treated, prior to discharge to air, then no scientific monitoring is required under BAT. The footnote to the BATc 8 Table (states that where H_2S and Ammonia monitoring are identified as produced in a Biological Treatment activity that *"the odour concentration may be monitored instead*".
As there are no environmentally designated sites within the screening distance that are likely to be impacted by Ammonia releases and as the H_2S discharge is a contaminant of the air emitted from the site (rather than a major or specific emission) then these emissions are deemed an odour issue and are therefore discussed and monitored as Odour (see Odour section below).
BATc 15 and BATc 16 relate to the measures to be applied where an emergency flare is installed at the plant. BAT is to use flaring only as a safety measure, or at start-up or shut down when the plant is operating under non routine conditions. They advise that the flare requires to be correctly designed and continuously monitored during its operation. The results of the monitoring should be recorded together with both the frequency and duration of any flaring event as part of an overall flare management system.

The only point of note with the application is that the CO found no reference or record of an inventory of waste gases within the application. This is required to be maintained under BATc 3 "*In order to facilitate the reduction of emissions to water and air, BAT is to establish and to maintain an inventory of waste water and waste gas streams, as part of the environmental management system (see BAT 1)"*
The Inventory should include: Details of waste streams, Methods of treatment, and Emissions (more fully described in BATc3) and should be incorporated into the EMS under BATc 1

The elements covered in a full EMS system including the additional reports as follows

X. waste stream management (see BAT 2);
XI. an inventory of wastewater and waste gas streams (see BAT 3);
XII. residues management plan (see description in Section 6.5);
XIII. accident management plan (see description in Section 6.5);
XIV. odour management plan (see BAT 12);
XV. noise and vibration management plan (see BAT 17).

The lack of a reference to an inventory of waste gas streams within the application has the potential to impact on the efficiency of the abatement system to prevent or sufficiently reduce odorous gas emissions such that they can meet the ELVs in BAT conclusion 34.
Conditions will be added to the permit requiring a waste inventory of gases to be compiled once the plant is in normal operation mode. The inventory must include all the information required by BAT Conclusions and be supported by monitoring data identifying the composition, and quantity, of waste gas streams and the possible impacts from both fugitive and point source releases.
On receipt of the inventory of waste gases SEPA will assess whether any additional limits on emissions are required. There are several references throughout the application as to the gases the applicant expects to be produced.
SEPA recognises that under the Applicability criterion in the Waste Treatment BATc 3 *"the scope (e.g. level of detail) and nature of the inventory will be related to the nature, scale and complexity of the installation, and the range of environmental impacts it may have"* and that this can be determined *"by the type and amount of wastes processed"*

Potential conditions would read as follows:

X.X.N Notwithstanding the requirements of Condition 2.7.2, the operator shall carry out a systematic assessment and review of any wastes generated by the anaerobic digestion activity described in Paragraph 1.1.4.5 of this Permit no later than 1 year after the first introduction of waste into the said activity and this shall be reported to SEPA.
X.X.N+1 No later than 1 year after the date of the permit the operator shall produce and maintain an inventory of waste gas streams being emitted from the Permitted Installation
X.X.N+2 The inventory of waste gas streams required by condition 2.7.4 shall include information about the characteristics of the waste gas streams, such as:
a) average values and variability of flow and temperature;
b) average concentration and load values of relevant substances and their variability (e.g. organic compounds, POPs such as PCBs);
c) flammability, lower and higher explosive limits, reactivity;
d) presence of other substances that may affect the waste gas treatment system or plant safety (e.g. oxygen, nitrogen, water vapour, dust).

Fugitive emissions to air:

Summary
The handling and processing of wastes at the site has the potential to generate fugitive emissions to air including odour, dust and bioaerosol. The main causes of these emissions are spills, emergency releases, from Pressure relief valves, accidents, and incidents, and regarding dust and odour releases from the permitted activities during dry weather

Odour
The generation and control of odour at the site is dealt with under the Odour Section below

Dust
The Waste Treatment BREF and the Anaerobic Digestion Technical Guidance Note 38 provide little guidance to what is BAT for dust reduction at Anaerobic Digestion sites, this is because the AD process is primarily undertaken in sealed vessels, and it is likely to be directly associated activities which are more likely to generate dust. The DAAs likely to give rise to dust emissions from the site have been identified as the movement of road transport within the site and dust from handling dry energy crops.

Dust generation from roadways and vehicle movements are common to several PPC Activities and the Process Guidance Notes covering Part B Air emissions activities provide alternative statutory BAT guidance on how dust from roadways can be controlled.
These measures include the implementation of one or more of the following measures:

Reducing the speed and complexity of vehicle movement within the site, Employing vehicles which have exhausts directed above the horizontal (to avoid the impact of the exhaust raising dust when travelling on internal roadways), Installing wheel-cleaning facilities or vehicle cleaning areas to prevent dust being carried off the site, Hard surfacing for roadways where possible of macadam or concrete for the final section of road leading to the public highway, Road Sweeping, wetting, or sealing, may be used to reduce dust emissions from roads.
The PG Notes acknowledge that the techniques used depend upon the type of road under consideration. It is recommended that roadways in normal use, and in particular vehicle turning areas, should have a hard surface capable of being cleaned or kept wet.

The applicant has advised that with regards to dust from energy crops: Transport vehicles will be dampened down during delivery at dry times when dust may be a problem. Energy crops will be stored in clamps such that in general operation there is no potential for dust aggravation from storage facilities. The risk of exposure is during drier summer months. Where internal road transport of processed materials is likely to generate dust, SEPA would expect the operator to sheet vehicles, or where possible, condition the materials being transported with water.

As a SWMA, SEPA would expect the site to operate with a high level of housekeeping within the Reception Building, or when transferring bio solids, and will expect the operator to use BAT to avoid generation of dust and particulates across the site.

Bioaerosol
The potential sources of bioaerosol have been identified as the solid waste reception area and digestate handling.

The Reception Building has been constructed to provide a fully enclosed environment operating at negative pressure. The building is connected to a two-stage odour control system, as described previously, ensuring all bioaerosol produced are treated. The site will operate such that transfer, and handling of materials, is only undertaken when the roller shutter doors are closed.

The applicant has outlined that Agricultural feedstock are only stored short term inside the reception building and that the Feed hoppers are situated within an enclosed building, under negative pressure, and with air extraction to the abatement system, such that the potential to release bioaerosol from this part of the process is minimal.

SEPA will include a permit condition requiring that operations be only be undertaken with the roller shutter, and any additional personnel access doors, closed.

Bioaerosols have the potential to be released during the storage and transfer of digestate. At the site, the storage of digestate will be in a sealed tank, and the transfer to road tanker will be undertaken via sealed pipework, thus the potential for bioaerosol release is deemed to be minimal.

In conclusion the applicant believes that the potential for harmful emissions of bioaerosols from AD plant is low, the nearest sensitive receptors are located beyond 250m of the site boundary, and accounting for the measures taken on the site to minimise and abate potential emissions. the risk from bioaerosols from the site is low.

Anaerobic Digestion is a fully enclosed wet process in which all emissions to air are captured and conveyed to the various biogas utilising processes and minimising fugitive emissions.
In its publication “Guidance for developments requiring planning permission and environmental permits” the Environment Agency states that “We [*the EA*]do not consider that bioaerosol from anaerobic digestion are a serious concern” adding “as long as no composting is taking place at the facility.”

SEPA in its guidance on BAT for AD Plants only require a site-specific bio-aerosol risk assessment to be undertaken for AD plant where sensitive receptors (workplace and dwellings) are located within 250m of the site boundary. This view is supported by the Scottish Government in its planning guidance on AD

plants which states that *'Environment Agency (EA) research suggests that bioaerosol levels are likely to be equal to or below natural levels within 250 metres of a composting operation'* adding crucially that If mitigating measures are taken this distance may be reduced and that reductions in this distance should be evaluated within the risk assessment carried out for the site.

In this case the nearest sensitive receptors are over 250m away from the site boundary, all bioaerosol generating activities are carried out within an abated building operating under negative pressure, and no composting is taking place.
All indications are that bioaerosol at this AD plant poses a very low risk to human health and would be less of a concern than odours. Consequently, if odours are controlled then bioaerosol would be similarly controlled as particulates are more easily removed and would have a greater tendency to fall out.

BAT Assessment
Fugitive or diffuse emissions to air are describe in the following BAT Conclusions
General BATc: 4 5 14
Anaerobic Digestion BATc 38

As the AD process is carried out in sealed vessels the main source of dust and bioaerosol is associated with the handling and storage of the "input" and "output" materials (i.e. during the pre and post AD stages). The operator must consider the requirements of the BATc 4, and 5, as well as BATc 14, in their operating procedures.

Odour:

Overview
The applicant acknowledges that there is potential for the release of odour into air, with a main source being the handling and storage of feed materials prior to digestion.
The application describes the operational measures proposed for the site to limit odour generation and release to air.
This section summarises the main odour sources and risks, together with the technical and operational control measures which are to be implemented.

The following list contains the main potential sources of fugitive odour emissions:
Delivery, storage and pre-treatment of incoming waste;
The AD process;
Pasteurisation and storage of digestate;
Malfunction of the odour control system;
Failure of the flare;
Incomplete/partial combustion in the CHP plant.

Major Potential Odour pollutants

Hydrogen Sulphide (H_2S)
H_2S within the plant will be controlled, and its generation minimised, through the addition of Ferric Chloride and its precipitation as Ferric Sulphide

The sulphur levels in the biogas will be kept at a low level by the controlled addition of air and dosing of Ferric Chloride into the digestion process. This is a standard technique for controlling H_2S generation within several industries including waste and water treatment, it is cost effective and efficient in terms of energy, chemical use, and waste production. Once produced the Biogas will pass through a carbon bed to remove any residual H_2S in the gas stream.
Monitoring of H_2S in gas will be a mix of continuous monitoring using the SCADA system and weekly spot samples taken from the headspace of the digester using a handheld H_2S monitor.

Before the clean-up process the raw biogas will pass through an activated carbon bed which adsorbs the H_2S from the raw biogas, the H_2S loading of the activated carbon bed is monitored so that when the bed is saturated the activated carbon is removed and replaced.

The proposed desulphurisation process ensures that H_2S levels in the biogas is below a level to ensure that in the case of an emergency venting event, odour levels are minimised.

Ammonia (NH_3)
ABP materials such as chicken litter, manures, and slurries, are assessed to be the principal sources of the release of ammonia on the site. Ammonia release will be minimised by not storing "nitrogen-rich" wastes on site for long periods and by carefully controlling the handling and storage of this type of waste. It is a requirement of the planning permission that this be carried out for liquids in the sealed tank system and for solids within the odour abated process building.
The applicant details that an ammonia scrubber has been fitted at the front end of the biogas treatment plant this is to strip ammonia generated within the digestion process prior to upgrade to Biomethane

Ammonia emissions to designated sites is controlled under the Nature Conservation Protocol, and as the Bangley Quarry site is situated on or adjacent to an SSSI then the impact of ammonia releases from the site requires to be reviewed. The guidance issued for ammonia inputs from PPC Part A Intensive agriculture sites states that where the designated features of interest on the SSSI are Solely those of geological, geomorphological or earth science interest, then it is unlikely that increased N-deposition or elevated ammonia concentrations will cause damage to these features.
As there are no other designated sites identified within the relevant screening distance (See section 4.4 MCP Screening Tool result above) the Bangley Quarry AD application can be screened out and proceed to the determination stage without any further assessment of Ammonia impacts.

The BAT Conclusions allow the operator to monitor Ammonia as "Ammonia" or as treat it as an "Odour issue" when this would be more applicable. Given that there are no environmentally designated sites within the screening distance then the major issue with ammonia (and associated amines) would be the smell of these compounds at residential properties then Ammonia and amine releases will be considered as an odour issue. Control of ammonia releases at source, and emissions abatement, are effective in minimising odour issues with respect to Ammonia and amine generation,

Restrictions on Waste types
The Site will process organic feedstock including specially grown energy crops, green waste, and liquids, at a capacity throughput of 100,000 tonnes per annum. As discussed previously there is a planning restriction which prohibits the acceptance of packaged or processed/pre-prepared food waste at the site, prohibiting the site form accepting Municipal Waste under EWC code 20 except for those wastes similar in nature to agricultural materials the site is permitted to accept

Operational Control

Waste Reception Handling and Storage
All waste received on Site will be in delivered in enclosed vehicles or bulk tankers. No delivery vehicles shall access or egress the site between 1900 to 0700 on any day.

Concerns were raised during the Planning process regarding the potential for odour and air quality issues from the use of Animal by-products as feedstocks for the digestors. On appeal the planning reporter included a planning condition which requires that all vehicles delivering loads of animal by-products materials to the site be sheeted/covered from their point or origin to the site, and that sheeting/covers will only be removed once the vehicle is inside the process building within the site and the doors that building are closed. The condition also requires that sheeting/covers will be replaced on all such delivery vehicles prior to leaving the process building.

The bulk of feedstocks for the plant are to be acquired on a 'just-in-time' approach with feed materials being stored and collected from the place of production as and when they are required to feed the digestion process. As a result, the site has limited capacity to store feed materials. The short-term storage enables the site to both receive materials and provide the necessary quantities of feedstock to allow mixing and blending prior to feeding the materials into the sealed digester.

This method of operation minimises the risk of odour release associated with waste stored on site for long periods. Wastes such as Brewery and distillery by-products and ABP materials such as chicken litter, manures, and slurries, being readily biodegradable are prone to rapid degradation and are synonymous with odour generation if left sitting around for too long.

Agricultural feedstocks comprise both liquid and solid feed materials, as described above, will be stored off-site, in clamps, tanks, silos and bales on the farms on which they were produced, Solid waste and those non waste solids deemed to be potentially odorous accepted on the site will be unloaded into the clamps within the enclosed process building, with all liquid feedstocks being unloaded into the sealed import tanks (he planning permission for the site requires that no animal by-products shall be loaded or unloaded in any outside areas) Non-waste feedstocks which do not give rise to odour e.g. baled straw will also be stored and processed within the process building directly before transfer to the AD system.

Process Buildings
The main potential source of fugitive odour emissions is likely to be from the 2–3 days buffer storage of feedstock within the process building. The process building, has been fitted with fitted with an air extraction system which draws air to an abatement system designed to produce an emission rate of less than 1,000 OUE/m3. Fast acting roller doors fitted with air curtains are incorporated into the building design and the process areas are under negative pressure. Whilst there is potential for odour to be released from non-waste solid feedstocks in the outdoor feed hoppers, this is likely to be minimal and is mitigated by siting them in an open area within the process building such that the odour control unit will mitigate any potential odour releases.

Anaerobic Digestion (AD)
The digestion process occurs within three concrete digesters with airtight gas domes. There will be no odour emissions from the digester tanks as they are sealed.
The applicant has advised that a manual and/or automatic monitoring system will be installed to ensure a stable digester operation. The system installed will monitor physico-chemical parameters such as pH, alkalinity, temperature, liquid, foam levels, and pressure within the digester. The system will also ensure that the digester feed parameters are monitored and maintained at optimum conditions for digestion e.g. the concentration of volatile fatty acids (VFA) and moisture content.
The systems will also monitor for potential pollutants such as ammonia within the digester and digestate and the concentration of H_2S in the biogas. As part of the maintenance system the operator will monitor for signs of grit build-up in the bottom of digesters and have an appropriate de-sludging programme.

There is potential for emissions of odour in the event of the pressure relief valves operating, these are safety features and will only vent in emergency conditions i.e. the normal operating pressure in the digester gas storage is approx. 2 millibar, the vent will not activate until a pressure of 8 millibar is reached. The applicant describes that for the vents to operate it would require the CHP, flare, and some function of the clean-up/ injection process, to shut down simultaneously and be off for several hours. This simultaneous failing of multiple items of Gas handling and safety plant is very unlikely given the electronic control systems and routine maintenance regimes employed at the site.
Following digestion, the digestate will be separated in a screw press located in the enclosed pump room between the digester tanks. Significant odour emissions are not expected to occur from this process. Digestate will be stored in digestate storage tanks to the northeast of the site. This tank will have an enclosed air-tight roof, as a result there is no potential for odorous emissions from this tank.

Biogas clean-up and processing
Biogas is upgraded in a clean-up plant. The outputs from this plant are CO_2 and biomethane (CH_4) both of which are odourless gases.
Biomethane is a valuable product, and every effort is made to contain this until it is injected into the national gas network. Should this plant suffer a malfunction the biogas feed will be closed off and in the absence of available gas storage will be directed to either the CHP plant for energy or heat generation, or to the emergency flare for safe combustion, thereby reducing the potential for odour from the site
The biogas clean-up process emits CO_2 as a gas. By-product CO_2 will be vented to the atmosphere.

CO_2 is an odourless gas which will not cause offensive odour emissions. Biogas will be combusted on-site to meet the site parasitic electricity and heat requirements.

Odour from Spills
Evaporation from spills of odorous or volatile liquids is a potential source of odour emissions, it is therefore essential that spills are contained and cleaned up. The benefit of containment is that it lowers the surface area of a volatile liquid and thereby lowers the potential for volatilisation and odour generation.
An impermeable bund will surround the AD tanks and process building to contain spills or leaks. allowing materials to be collected and disposed.

Cleaning & Maintenance
The waste reception building will be routinely cleaned and emptied of waste during off-peak periods to prevent anaerobic conditions developing within the waste. The fabric of the building shall be inspected to ensure its integrity, ability to contain odours, and maintain negative pressure, any damage should be investigated and repaired. Contaminated air from any tank being emptied (e.g. during Inspection maintenance or cleaning etc.) will be passed through the odour control system.

Odour Management Plan
The control and management of the plant are key elements in controlling emissions from the plant. Permit conditions require the operator to produce, implement, and maintain, an Odour Management Plan for the site.

The applicant has developed and supplied an Odour Management Plan which has been drawn up using the SEPA Odour Guidance (2010).
In the OMP the applicant has identified the key areas of the activity which could potentially give rise to odour emissions and has outlined the methods by which they will assess, reduce, and prevent, these potentially odorous emissions. The applicant currently operates sites in England and understands that the OMP is an evolving document, as such they have outlined that should complaints or issues arise these will be investigated, and that following a review of operations these will be discussed with SEPA to identify opportunities for odour management.

BAT Assessment
Odour issues are identified in the following BAT Conclusions
General BATc: 10 12 13 14
Biological Treatment BATc 33 34 and Table 6.7
Anaerobic Digestion BATc 38

BATc 38 requires the operator to *"monitor and/or control the key waste and process parameters"* and provides examples of those parameters required to *"reduce emissions to air".* This is supported through implantation of BATc 33 and BATc 34 for the activity, these require the operator to:

1. undertake waste acceptance checks and ensure that the input to the biological treatment stage is suitable in terms of nutrient balance, moisture, or toxic compounds, the latter of which could "poison" the digestion process and lead to increased odour emissions.
2. Install appropriate abatement equipment from those listed in the table in BATc 34 (singularly or in combination).
3. Comply with the BAT associated emission levels (BAT-AELs) given in Table 6.7 considering the footnote which advises that for NH_3 "*Either the BAT-AEL for NH_3 or the BAT-AEL for the odour concentration applies"*.

Two points of note: As stated previously there is no requirement to monitor or apply emission standards to Dust and TVOC at Bangley Quarry as these are described as applying to the Mechanical biological treatment of waste not Anaerobic Digestion and there are no environmentally designated sites within the screening distance likely to be impacted by Ammonia releases. As such it has been determined that for

Bangley Quarry; Ammonia (along with H_2S) will be monitored as Odour with a BAT-AEL between 200-1000 OUE/Nm^3 (Table 6.7)

Based on the information provided with the application it appears the relevant Odour BAT-AEL given in table 6.7 of the Waste Treatment BAT Conclusion (2018) odour limits can be met using the technologies incorporated into the design in that; the emissions from the abatement system are less than 1,000 OUE/m^3.
The installation benefits from being a new build of bespoke and fully integrated design and the operating procedures as set out in the application documents conform to BAT and if fully implemented should minimise fugitive emissions from the site.
The operator has classified the odour from the AD Plant at the highest level, described as 'More offensive odours,' and set the odour concentrations at 1.5 OUE/m^3, the indicative criteria of significant pollution. The odour impact assessment modelling indicates that in a worst-case scenario the maximum odour concentration at the identified receptor is 0.50 OUE/m^3, well below the 1.5 OUE/m^3 considered as indicating significant pollution, this level is also below the 1.0 OUE/m^3 recommended for a "hypersensitive population". The result is indicative that there is no significant odour impact off-site, and the predicted short-term odour impacts are considered acceptable.
It is recognised that an Anaerobic Digestion Plant will generate odour which if left unabated can cause nuisance, a loss of amenity, and in extreme cases harm to human health. SEPA requires the applicant to demonstrate the measures taken to minimise odour comply with BAT.
The Bangley Quarry Plant is a purpose designed and built AD plant such that the building design and structures it contains have incorporated the key requirements to prevent or reduce emissions from the plant.
As a result, SEPA requires the operator to use BAT to minimise odour emissions from the site and ensure that emissions from the Bangley Quarry Biogas do not exceed the 1,000 OUE/m^3 upper limit, and that odour levels at the sensitive receptors do not exceed 1.5 OUE/m^3.

5.3 Emissions to Water

Point Source Emissions to Surface Water and Sewer:

Overview
A detailed drainage scheme for the Site is provided in the Application. There are no process discharges to the water environment or sewers outlined in the application, and no existing Scottish Water sewers within the vicinity of the site. The only discharge from the site will be of clean surface water via an oil interceptor to prevent any oil from leaving the site.

Details provided in the application show that the site will have two drainage systems:

The Sealed drainage system for liquids which pose a risk of contamination. Effluent emissions from the anaerobic digestion plant, gas treatment and Reception Building. These will be redirected back into the AD process for treatment.
And
Clean surface water drainage containing uncontaminated surface water from the site including those areas where there is low risk of contamination will be directed into the surrounding water in the quarry. (Where surface water drains to currently).

Washing Of Vehicles
The discharge from the washing of vehicles on site could potentially be considered a process effluent discharge, such that any washing of vehicles on the site needs to be controlled with run off to the sealed drainage system or interceptor.

Domestic Wastewater
There is no discharge of domestic wastewater from the office and welfare facilities (Not considered to be part of the permitted installation) these will be collected and regularly tankered off site by a licenced contractor.

Bundwater

With no discharge of process waters to either sewer or surface water and with vehicle movement to and from the quarry being subject to planning restrictions the management of rainwater collecting in bunded areas and sumps “bundwater” requires to be controlled on-site whenever possible

The operator has requested that “clean” bundwater be permitted to be discharged from the bunds/sumps to the surface water system with only contaminated bundwater tankered away. They have advised that to facilitate this, and avoid potential pollution, collected surface water will be tested before being discharged to the water environment using the protocol summarised below

A visual check will be carried out for evidence of spills or leaks within the bund that may have entered the surface water collection chamber. In addition, consideration will be given to any incidents or spillages that have occurred in the bund during the period since the last batch of bundwater was released, as recorded in the site diary, on daily site inspection records, or incident reports, within the site Environmental Management System. Should these prove to be negative the bundwater will be checked for visual and olfactory signs of contamination visible grease and oils, including oil sheen, staining, discolouration, and odour. If this test fails to identify any contaminants, then the accumulated bundwater, a spot sample will be taken and analysed for the following parameters:

Parameter	Benchmark Threshold for Water Release	Unit
pH	6- 9	pH
COD	<80	mg/l
Suspended Solids	<30	mg/l
Total Phosphorous	<2	mg/l
Ammonia	0.1	mg/l

Where Bundwater quality is found to be within acceptable benchmark thresholds (described as “clean”), AND it is not required in AD process, it will be pumped to an access chamber on the surface water drainage system and allowed to flow to the quarry pond at a controlled rate of 2/ls. A flowmeter connected to the SCADA system will measure and record the volume discharged during each release.

Where the Bundwater quality fails to meet the acceptable benchmark threshold (described as “dirty)” and unsuitable to be released from the bund as Surface Water, a manually operated shut off valve will be used to close off the system after which the operator will either divert the water for use within the AD process (if suitable) or will have it removed from site, via road tanker, to a suitable licensed treatment or disposal facility.

If a spillage or incident has occurred in the bund, then the operator recognises that there will be the need for additional monitoring for a period after the incident to ensure that any bundwater subsequently discharged may not be “clean.” The operator has indicated that a more extended analysis suite may be required (dependant on the nature of the spill or incident), to confirm that the bundwater is suitable for discharge. The applicant has stated that operator will evaluate the specific circumstances and risks associated with any incident that might occur, and devise and implement any additional monitoring as required.

Finally to check the reliability of sample analysis results undertaken in the onsite lab, the operator will periodically send samples for the same analysis conducted on site to an outside accredited lab to allow

the accuracy of sampling to be monitored and verified. This will be undertaken quarterly for the first year of operations, and on an ad hoc basis thereafter.

SEPA discussion
In assessing whether the method proposed by the applicant for the discharge of rainwater collecting in bunds to surface water is BAT. SEPA has referred to the Waste Treatment (WT BREF) and The Emissions from Storage (EFS BREF) Reference Documents. Both documents briefly cover the issue of the collection and discharge of rainwater falling on bunds "bundwater", these are summarised below the main point is that it is not specifically ruled out.

Some specific BAT techniques are as follows:

Collecting rainwater falling on the storage and processing areas along with tanker wash water, occasional spillages, drum wash water, etc. Rainwater is returned to the processing plant or collected for further treatment if it is found to be contaminated.

Under Techniques for the optimisation of water usage and reduction of wastewater generation BAT is

Separately discharging uncontaminated roof and surface water.

Systems already applied for the prevention of fugitive emissions are relevant to drainage systems for example *having procedures in place to ensure that the composition of the contents of a bund sump, or sump connected to a drainage system, are checked before treatment or disposal;*

Chapter 2.3.13.3 Waste Treatment states when talking about couplings in bunds

• *Rainwater falling over the rest of the bund area falls to a sump and, if uncontaminated, can be pumped to the site interceptor and discharge points. The bund areas are inspected, maintained and cleaned. Pollution of water discharges can occur but are minimised by design and management.*

The main Waste Treatment BAT Conclusion covering this activity is BATc 19

BAT 19. To optimise water consumption, to reduce the volume of wastewater generated and to prevent or, where that is not practicable, to reduce emissions to soil and water, BAT is to use an appropriate combination of the techniques given in Table below.

The measures presented in the table can therefore be used in combination to provide the BAT regimen for the Bangley Quarry site Measures f.(Segregation of water streams), g. (Adequate drainage infrastructure), and h. (Design and maintenance provision to allow detection and repair of leaks)are particularly applicable to what is proposed

The role of the bund is to provide secondary containment in the event of a catastrophic failure or significant leak from tanks and infrastructure. It is not meant to capture rainwater which would otherwise fall onto the ground and either soak in or run off to a watercourse or water body. The collection of rainwater in a bund reduces the volume of safe storage and therefore needs to be disposed of, however the bundwater is not free of contaminants and therefore to define the "bundwater" as simply "Dirty / Polluted" and "Clean" is too arbitrary and that testing (as intimated by the applicant) without a benchmark appears too subjective to authorise what is effectively a discharge under the 2011 Regulations.

A PPC Part A permit with respect to water discharges is considered a "Relevant Authorisation" under The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) ("the 2011 Regulations") provided it complies with the requirements of those regulations. Schedule 10 Part 2 paragraph 18 of the 2011 Regulations, state that: SEPA must take into account paragraphs 15 through 17 of Schedule 10 part 2 of the 2011 Regulations when authorising an activity covered by them. This

means that a PPC Part A permit authorising any discharge to water must comply with the requirements of the Controlled Activities Regulations implementing the Water Framework Directive.

According to SEPA's document *"The Water Environment (Controlled Activities) (Scotland) Regulations 2011 -A Practical Guide"* provided that is there is no visible sheen, SEPA does not require a licence under those regulations for the discharges of surface water or uncontaminated rainwater which has collected in a storage bund and describes that these discharges are to be regulated through General Binding Rules (GBR). Such that for non PPC Part A sites the discharge into a surface water drainage system would be carried out under GBR 11 where Rule a) states *"Oil, paint thinners, pesticides, detergents, disinfectants or other pollutants must not be disposed of into a surface water drainage system or onto any surface that drains into a surface water drainage system;"* and Rule c) States that *"sewage or trade effluent must not be discharged into any surface water drainage system".* Therefore, to authorise the discharge of bundwater to a surface water system SEPA must be satisfied that these two rules can be complied with and that the system of determining whether the bundwater is "Clean" or "Dirty / Polluted" is robust enough to distinguish between normal surface water run-off and process contaminated bundwater. This would involve the operator being able to demonstrate that any bundwater discharged is of comparable standard to a normal surface water run-off from an industrial site and that it is free from contamination with process liquids and effluents which the bund is designed to collect and contain (e.g. from leaks, drips, spills from flexible hoses etc.). Simply testing without reference to a particular standard is considered meaningless as the bundwater will collect surface contamination (e.g. solubles' from concrete, bird or animal droppings, leaf litter, moss, etc.) and as a result, it is therefore unlikely to be totally "Clean" and never meet a zero standard.

These directly associated activities are authorised under CAR provided they comply with the requirements set out in the 2011 regulations. The proposal indicates that prior to discharge the water from bunds will be subject to analysis and only if "Clean" will they be discharged. This exceeds what is required under the GBR relating to oil bunds. However, with mineral oils there is often a distinct and recognisable visible sheen denoting the presence of oil (even in small amounts). With soluble pollutants it becomes impossible to determine contamination without testing.

The level of authorisation required under the 2011 Regulations indicates that the risk of pollution from the release of "clean" bundwater is deemed low (a GBR activity) requiring only visual and olfactory assessment prior to discharge. The BAT for PPC Part A is that tanks and other infrastructure within the bund be routinely inspected for leaks, corrosion, and damage, and that where there is no contamination and the bundwater is "clean" then it should be segregated and disposed of independently from other effluents.

Initial Checks
BAT in this case is for the operator to implement a robust and frequent tank and infrastructure inspection procedure (including investigation of any staining on the bund floor) coupled with both a visual and olfactory assessment and a "simple" pH check. This is in line with what is expected under both BAT and the 2011 Regulations Guidance and should be sufficient to indicate whether bundwater is "Dirty/Polluted" in the first instance.

Bundwater Pollutant limits
When reviewing the limits proposed by the operator in the Surface Water Discharge Procedure (summarised above) SEPA requires an indicative set of standards to review against.

A 2013 WCA report to DEFRA, which included SEPA scientific input, gave the results of a study into storm water and derived a value for the average levels of contaminants found in storm water discharges from a variety of built environments, Tables 6.1 and 6.2 in the report detailed the Event Mean Concentration values derived by Mitchell et al in a 2001 study and which the WCA report of 2013 states

"May be used in the model to estimate concentrations of pollutants in urban run-off."

Although at the time of the report they cautioned that much of the data used for the estimations was *"relatively dated"* they believed it would be useful for a *"screening assessment."*
As such, the monitoring levels proposed by the applicant will be contrasted against those in the WCA report to derive a workable set of discharge standards which will ensure the discharge of uncontaminated "clean" bundwater to the surface water drainage system. The Table below includes relevant parameters and is based on the limit values listed for Industrial Commercial sites in Table 6.1 of the WCA/DEFRA report (Total Phosphate has been added due to the nature of the liquids being stored within the bunded areas at Bangley Quarry e.g. Digestate and biodegradable liquid feedstocks of animal and plant origin which could give rise to eutrophication)

Basis of Limit Value	Event Mean Concentration (EMC)	Unit
BOD	10	mg/l
COD	<80	mg/l
Suspended Solids	<30	mg/l
Total Phosphate	<2	mg/l
Ammoniacal Nitrogen	0.1	mg/l

In addition to the above determinants the operator would need to comply with the initial pH and descriptive (FOG) condition as follows as this is a general discharge requirement when discharging to Surface water.

pH 5 - 9
Fats Oils and Greases : The potential discharge shall not include traces of visible oil or grease

The acceptable benchmarks proposed by the applicant (Table under heading Bundwater above))are well within the range of the Event Mean Concentration values derived by Mitchell et al in a 2001 as presented in the 2013 WCA report as a "screening assessment". The only real difference is that the applicant proposal lacks a BOD limit.

SEPA Conclusions
SEPA will set the Acceptable Benchmarks for bundwater release and discharge to Surface waters to the limits set by the applicant.

Regarding the BOD requirement, SEPA appreciates that whereas a COD test can be carried out at the bench in about 2hrs; the BOD test requires a sample to be held at 20^{o}C for 5 days, which means it is not convenient to use BOD it as a routine benchmark prior to the routine disposal of bundwater.
The applicant identifies where a spillage or incident occurs within the bund, then there may be the need for additional monitoring and that "a more extended analysis suite may be required," and that to check the reliability of sample analysis results that the operator will periodically send samples to an outside accredited lab for Quality Assurance purposes. This will be undertaken quarterly for the first year of operations, and on an ad hoc basis thereafter. In both these cases SEPA would like to see a BOD test carried out on the samples as the materials in the bund are biodegradable.
SEPA will permit the site such that where samples exceed the values above, SEPA will deem the bundwater to be "Dirty / Polluted" and will require the operator to then recycle the bundwater back to the on-site digestion process, or alternatively dispose of it to a suitably licensed treatment or disposal facility.

Where samples are below the above values; SEPA will deem the bundwater "Clean" and suitable for discharge to the site surface water drainage system

This approach incorporates the BAT conclusion and brings the disposal of bundwater into line with the requirements of the 2011 Regulations, limiting the impacts of unnecessary road transport whilst providing a robust and proportionate framework for the control of bundwater and prevention of pollution from the site.

The use of sumps and discharges controlled by a penstock is fully in accordance with the Waste Treatment BREF and SEPA PPC Technical Guidance Note 38 “Anaerobic Digestion” describing what SEPA considers to be BAT for the anaerobic digestion (AD) of waste.

BAT Assessment
Point source or channelled emissions to Water are describe in the following BAT Conclusions
General BATc: 6 7 20 Table 6.1 and 6.2
Biological Treatment BATc 35
Anaerobic Digestion None

There are no BATc for water issues related to Anaerobic Digestion. BATc 35 requires the operator of a Biological treatment activity reduce the generation of waste water using the following techniques: segregation of waste water (from surface water), recirculation(where possible), and minimisation of the generation of leachate. The latter reference to the minimisation of the generation of leachate would not apply to AD given that the liquid fraction/residue of the digestion process forms the Digestate which can be pasteurised and used as a product (if it passes PAS110). Alternatively it is amongst the lists of waste which can be applied to land under a Waste Management Exemption (beneficial use of waste). It is worth noting that the comment in the table under row *c.” minimisation of the generation of leachate”* referring to “Optimising the moisture content of the waste in order minimise the generation of leachate” is appropriate as it shows the importance of this element in controlling the AD process.

There were concerns regarding the lack of a reference to an inventory of waste water streams within the application and its potential to impact on the efficiency of the abatement system to prevent, or sufficiently reduce, odorous gas emissions such that they can meet the ELVs in BAT conclusion 34, which should be part of the Environmental Management System, (BAT Conclusion 3). It was suggested that the following condition should be added to the appropriate section of the permit:
“X.X.1 By [Date] the operator must submit to SEPA, and thereafter maintain an inventory of waste gas streams being emitted from the activities described in Conditions 1.1.X.X and 1.1. X.X.
“X.X.2 the inventory of waste gas streams required by condition X.X.X must include all the information required by BAT Conclusion 3 in the Waste Treatment BAT Conclusions. This information must be supported by monitoring data identifying the composition and quantity of waste gas streams and their impacts from both fugitive and point source releases.”
(“Waste Treatment BAT Conclusions” was defined in the Interpretation of Terms as meaning Commission Implementing Decision of 10 August 2018 establishing best available techniques (BAT) conclusions for waste treatment, under Directive 2010/75/EU of the European Parliament and of the Council (2018/1147/EU), OJ L 208, 17.8.2018, p.38.”)
The review stated that on receipt of the inventory of waste gases SEPA should assess whether any additional limits on emissions are required. The application covers this issue in the assessment of BAT contained within Appendix 1 of the Operating Techniques Document under BAT 3, where the operator was to include an inventory of waste streams under the EMS. There are several references throughout the application as to what Gases the applicant expects to be produced on site (outwith those expected from the anaerobic digestion of waste). (See Table 1 in the Monitoring and Control Plan, and Table 1 in the Odour Management Plan).
Given the proximity to domestic properties the conditions requiring an inventory of waste gas streams has been inserted into the PPC permit (Conditions 2.7.4 and 2.7.5). Under the Applicability criterion in the Waste Treatment BAT 3 Conclusion it advises that “the scope (e.g. level of detail) and nature of the inventory will be related to the nature, scale, and complexity of the installation, and the range of environmental impacts it may have (determined also by the type and amount of waste processed).

Bangley Quarry has no relevant emissions to water and as a result the General BATc 6 and 7 monitoring of emissions and discharge standards do not apply, neither does the requirement of BATc 20 relating to treatment of wastewater by the techniques listed and to the BAT associated emission levels (BAT-AELs) in Table 6.1 (direct discharges to a receiving water body) or Table 6.2 (indirect discharges to a receiving water body). The only discharge from the site is surface water of which the operator describes as "clean" bundwater which is described as "Rainwater" in the Waste Treatment BREF. This distinguishes it from process effluents and must be kept separate from them, where possible, following which it can be discharged as a Surface water. The BREF describes under "*Issues related to coupling* [of Tankers]*"*

"Controlling potential leaks due to coupling devices by simple systems such as drip trays, or by designated areas within the bund system. Rainwater falling over the rest of the bund area falls to a sump and, if uncontaminated, can be pumped to the site interceptor and discharge points. The bund areas are inspected, maintained and cleaned. adding "*Pollution of water discharges can occur but are minimised by design and management."*

Further References are made to the Waste Treatment and Emissions from Storage BAT Reference Documents in the main text above.

Point Source Emissions to Groundwater:

Overview
There will be no point source emissions to groundwater from the site.

The site is designed to be fully impermeable in areas of liquid or material storage with a sealed drainage system. Only clean surface water will be discharged to the surrounding water environment system and there should be no impact on groundwater.
The drainage system has been designed for this as BAT and in accordance with CIRIA 736 standards. However, in line with the requirements of the Industrial Emissions Directive, Groundwater monitoring will be undertaken every 5 years.
The impermeable bunded area has been constructed to CIRIA standard and is designed to hold greater than 110% of the largest tank and 25% of the total storage volume of the AD and digestate storage tanks it contains. The bunds also contain all the pipework carrying (above ground) feedstocks or digestate.

BAT Assessment
There are no Point source or channelled emissions to Groundwater (and Soil)
There are No separate BATc covering the discharge of process effluents to Groundwater (and Soil

See the BAT assessment for Surface waters (above) for a general discussion on emissions to water

Fugitive Emissions to Water:

Overview
The main fugitive emissions to water would come from a spill or accident on site and would consist of the following potential pollutants: Digestate, distillery wastes, liquid animal wastes, which although polluting are deemed low hazard material borne out by the fact they can be applied to agricultural land as an alternative to inorganic fertilisers, vehicle washing, contaminated surface water run-off, and fire water.

The potentially Polluting materials at the Bangley Quarry site are as follows:

Olefins
With Diesel and Lubricating /Engine oil. All fuel and mineral oils are designated hazardous, it is therefore important to prevent these entering Surface and ground waters such that measures will be in place to

control access to these on site and storage is in either specially designed storage systems or within secondary containment systems

Process Materials and effluents
The potential pollutants all considered readily biodegradable organic materials and products with high concentrations of BOD, COD, Ammonia, Phosphate, and Suspended solid, if they get into surface water, they will have an immediate and major impact.

Ferric Chloride
A spill of Ferric Chloride would result in a significant decrease in pH of the receiving water, as it is an acidic salt, along with an increase in Iron which could lead to solids being precipitated and an unsightly growth of rust coloured slime.

Containment measures
The Drainage Design Strategy Report submitted in support of the application outlines the measures that the applicant has incorporated into the site which are designed to prevent or minimise fugitive releases of pollutants to surface water and groundwater, the key elements of the system are as follows.

Subsurface Structures
The site benefits from the fact that the number of subsurface structures already in place and which could provide a pathway for pollutants to enter ground and surface waters are minimal.
The drainage report and plans provided show that Subsurface structures on the new AD site are limited to the surface water drainage system, weighbridge run off collection system, and the process building sealed drainage system, thereby reducing the potential for impact caused by undetected leaks from old drainage systems and possible cross connections from abandoned drainage systems.
As a new build the applicant has been able to incorporate a leak proof system and present an accurate record of the drainage system on site. With no existing subsurface structures, they were able to engineer the system to suit the design of the facility rather than relying on connecting to an existing or ageing drainage system. As a result, they have been able to incorporate appropriately designed and sealed sumps. The applicant has advised that as part of the maintenance of the site the drainage system will be periodically checked.

Sumps
The applicant has included several purpose-built sumps within the site. These have been constructed to be impermeable and resistant to the drained contents. They allow potentially contaminated materials from the drainage of a process areas to be collected and tested. The applicant has outlined that the sumps will be subject to regular visual inspection and following analysis for contamination the contents will be pumped and disposed of as appropriate.

Secondary Containment Bund
The Site's feedstock storage tanks, digester tanks, and pasteurisation tanks, will all be located above-ground and sited within an impermeable bunded area. These have been constructed to Ciria C763 standard and consist of a bund wall built to the specification in the application and a sealed bund floor which will provide a contaminant resistant impermeable lining for the protection of Groundwater. The bunds have been sized to the standard parameters i.e. A volume more than 110% of the largest vessel and 25% of the total volume of the tank(s) situated therein. Calculations of the bund capacity and height to which a leak could reach have been provided and demonstrate that the bunds can contain the volumes without overtopping or failure.

Inspection and Maintenance
An inspection and maintenance regime will be put in place to ensure tanks, bunds, sumps, drainage systems, and connection points etc are all periodically inspected to ensure they are maintained in "a good state of repair"

BAT Assessment
Fugitive or Diffuse to Water are described in the following BAT Conclusions

General BATc: 1 3 4 5 19 21 Section 6.5
Biological Treatment BATc 35
Anaerobic Digestion None
BATc 1, BATc 3 - 5, and Section 6.5 of the BAT conclusion Document (Management Techniques), outline the requirements for the operator to implement an Environmental Management System with fully documented procedures to record what materials are accepted onto the site, and those material produced on site. The BATc outline the requirement for Training and Competency of staff, correct and safe materials handling and storage, and require spill, accident, and incident procedures, to be put in place. Section 6.5 details the requirement for an Accident Management Plan with the techniques the operator will use to "*prevent or limit the environmental consequences of accidents and incidents"* being detailed in BATc 21. The document advises that the level of detail in the EMS and its associated documents will be related to the nature, scale, and complexity, of the installation, the type and amount of wastes processed, and any environmental impacts which may occur (Section 6.5 details a Residue management plan)
BATc 19 lists several measures the operator should consider optimising including water consumption, reduce wastewater generated, and to prevent or reduce emissions to soil and water. The techniques outlined include several measures the operator should incorporate into both the design and operational management of the site. Under design and build, these include Impermeable surfaces, containment for tanks and vessels, roofing of waste storage and treatment areas, provision of appropriate buffering vehicle hardstanding, installation of Leak detection and repair systems and alarms, and the provision of Adequate and sealed drainage infrastructure.
Operational measures include visual inspection and monitoring to minimise the frequency and impact of overflows and failures, management control, use of covered or enclosed vehicles, segregation of water streams, and the recirculation of process/wastewater.

5.4 Noise

Noise Monitoring Overview
The noise assessment provided by the applicant draws on the results of the 2017 assessment (planning permission) and a separate noise survey undertaken in May 2023 for the PPC application. A summary of the details and results of these surveys are presented below.

2017 Planning Permission - Noise assessment
In September 2017, a 24hr background noise survey was undertaken in support of the Planning Application 17/00922/P for the '*anaerobic digestion (AD) plant at Bangley Quarry'* at 3 locations in the vicinity of the site. This was carried out in free-field positions, the locations of which were agreed with the local Environmental Health Department (East Lothian Council) as representing the Sensitive Receptors (SRs) most likely to experience any potential adverse impact from the AD Plant

The table below details the background noise levels recorded during the 2017 at the three closest Noise Sensitive Receptors (NSR)

Receptor	Average Background dB ($L_{A90,15\ min}$)	
	Daytime	Night-Time
Alderston Farm	48	42
Garleton Lodge	38	29
Huntingdon West Lodge	42	35

2017 Noise Assessment Results
The full 2017 noise survey can be found on the East Lothian Planning Portal in the list of application documents for Application 17/00922/P. The main conclusion is summarised below and forms the basis for the background noise levels presented in the 2023 Noise Survey submitted in support of the current PPC permit Application.

The 2017 assessment had originally intended to record the background noise level at a location in proximity to the Ugston properties. However, the independent acoustic surveyor was unable to find a suitable place to install the monitoring equipment. Instead, the equipment was set up at a location deemed by the surveyor to be the next most appropriate – in the vicinity of Alderston Farm.

The conclusion to the 2017 Noise Assessment reported that the background noise levels at Huntington West Lodge (the nearest SR) and Garleton Lodge, (the quietest SR) were compared to the predicted noise levels from Bangley AD Plant during of each of the four operating scenarios (i.e. Noise predicted during the Daytime and Night-time under both Normal and Emergency operations)

The results of the monitoring assessment showed that the calculated Rating Level at the properties during all four operating scenarios was less than the background levels recorded at the time of the survey.
The consultants stated that in terms of the BS4142 assessment, the results were indicative of low adverse impact, and that it could be concluded that the noise associated with the AD Plant would not adversely impact the sensitive receptors in the surrounding area.

In its Statutory Consultation response SEPA reviewed the Noise Assessment submitted with the planning application and advised that subject to the recommended conditions being imposed by the planning department SEPA would not object to the to the application on Noise grounds adding that Noise controls would be imposed through the PPC permit process. The conditions within the planning permission are as follows:

Time Period	Noise level Criteria
Daytime (07:00 – 23:00 hours)	Rating level no greater than 5 dB above background ($L_{A90,1\ hour}$) Internal Noise Rating Level no greater than NR25*
Night-Time (23:00 – 07:00 hours)	Rating level no greater than 5 dB above background ($L_{A90,15\ min}$) Internal Noise Rating Level no greater than NR25*

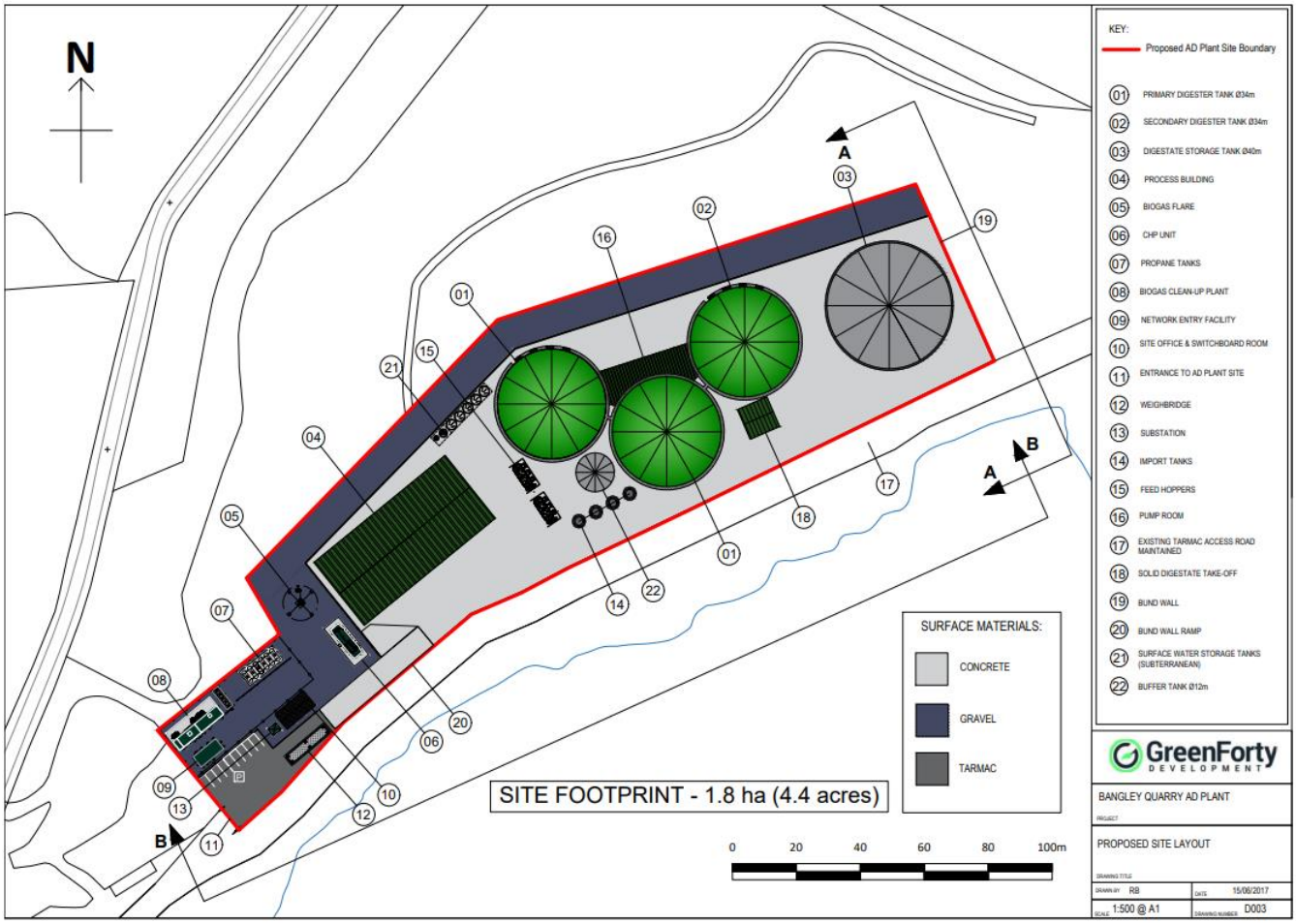
* Windows open 50mm

2023 PPC Noise Assessment Survey
The 2023 noise assessment report built on the findings of the report submitted to the planning Authority and commented on by SEPA in 2017. This survey undertook further modelling with the report providing further and more detailed information relating to the Octave band sound pressure levels in dB over a range of frequencies for each individual noise source (individual plant and equipment) installed at the AD site.

Noise Sources
The planning requirements(above) are such that there will be different potential noise sources associated with the daytime and night-time operations (summarised in the table below), with the location of these potential noise sources shown on the associated plan. Data supplied in the report submitted with the application provide a detailed breakdown of dB levels across a range of frequencies of each noise source. Essential noise sources from the site are generated in 4 different operating scenarios.

Scenario	Active Noise Sources
Normal Daytime	CHP Biogas Plant Feeders HGV Movements

	Tractor - trailer movements
Normal Night-Time	CHP Biogas Plant Feeders
Emergency Daytime	CHP Biogas Plant Feeders HGV Movements Tractor - trailer movements Flare
Emergency Night-Time	CHP Biogas Plant Feeders Flare



Sensitive Receptors

As stated earlier in this decision document the AD Plant is located entirely within the former Bangley Quarry, maps of the area show that the location is rural in nature with a small and dispersed number of residential and commercial properties situated within 1 km of the site boundary, these have been identified as Sensitive Receptors.

Both the 2017 Noise report and the 2023 Noise report identify the same 7 sensitive receptors (all residential) that are located at varying distances within a 1km radius of the Site boundary.

these are listed below and shown on the map in Section 4.4 Identification of Sensitive Receptors (earlier in this Decision Document).

Sensitive Receptor	Distance from Site Boundary
Huntington Stable Cottage	256m
Huntington House	323m
Huntington West Lodge	324m
Garleton Lodge	366m
Daffodil Cottage	501m
Ugstone Cottages	611m
Ugston Farm	651m

As can be seen, there are no sensitive receptors within the 250m-radius 'buffer zone' recommended by the Noise guidance issued by SEPA and the Scottish Planning Policy (SPP) with the closest sensitive receptor confirmed as being located 256m from the Site boundary.

Modelling

As in the 2017 assessment the predicted noise levels from the key noise sources in the 2023 assessment have been 'mapped in' for the four operating scenarios (daytime and night-time under both normal and emergency operation)

The model was described as allowing for basic sound level modelling using point sources of noise, screening from process equipment, buildings, barriers, bunds, and noise receivers. It also took into account the noise screening provided by the adjacent quarry faces (north and east) of the site, as well as those further away to the south of the quarry. The report submitted detail on how it was not possible to account for screening from the landform outwith the quarry due to its complexity and uncertainty, albeit recording that there are several features which should screen noise out. The report states that the model has assumed a free field and that it is likely that the sound levels at each of the sensitive receptors will be lower than those reported.

Colour-coded noise maps have been provided alongside the data to give an indication of the accumulation and attenuation of various sources of noise over distance. It is reported that these not only provide a useful visualisation of the noise impact from the AD plant, but they are useful in corroborating the results of the BS4142 assessment.

The Planning Condition clearly specifies that all noise measurements must be made with windows open at least 50mm and the model makes allowances for this.

Noise Rating (NR) Curve Assessment

The Noise report records that to assess the internal Noise Rating through a 50mm open window at the sensitive receptors, as required by the planning condition, the external octave band levels have been assessed, and a 15dB reduction has been implemented. The Noise Rating levels predicted at the Sensitive receptor using the model (presented in the report) are below the internal NR 25 & 20 criterion for both the daytime and night-time periods. As such, internal noise levels are considered to result in a 'No noise, or barely audible or detectable noise' scenario The full Noise curve assessment results can be found in Tables 5.3 and 5.4 of the Noise assessment report submitted as part of the application)

Acoustic Feature Corrections

In the BS4142 assessment, acoustic features are categorised as tonal, impulsive, or Intermittent, occurring as whine, hiss, screech, humming sounds, and/or distinct impulses such as bangs, clicks, clatters, and thumps. The reports provided to SEPA acknowledge that the noise associated with the Proposed Development will exhibit certain of these acoustic features. The report suggests that the noise associated with the AD Plant is unlikely to be intermittent, given that it will be operating on a continuous basis, so no penalty has been applied in this case. The 2023 Noise model described that the assessment had been undertaken to establish the external noise levels from proposed fixed plant installed at the development, comparing the worst-case levels associated with the fixed plant with the existing measured average background noise level, LA90y, at the closest sensitive receptors. As a result the BS4142:2014

section 9.2, +3 dB correction was applied to create the 'Rating Level' at the receptor to "account for any perceptible intermittency within the plant operations".
In the 2017 Survey a tonality correction of +2 dB and an impulsivity correction of +3 dB were applied to account for the noise characteristics of the AD Plant at nearby noise receptors.

The results of both the initial 2017 planning assessment and the 2023 plant in situ assessment comply with the noise standards given in BS4142:2014+A1:2019

Sound level maps
To provide a visualisation of the noise impact of the Bangley Quarry AD Plant , Noise contour plots including 3-D Plots (2023 assessment), identified as Sound level maps (2017 assessment) were prepared using a modelling tool. The maps corroborate the results of the BS4142 assessments well, with differences noted particularly in the night-time scenarios. They were particularly effective in providing a visualisation of the significant screening effects of the quarry surrounding the AD Plant. The Noise plots/plans indicate that the majority of the noise resulting from the Proposed Development will be contained within Bangley Quarry.

Accuracy
No modelling tool can fully replicate real-world measurements, they are only an estimate, the precautionary approach is to use a worst-case scenario, as in the case of the 2023 noise assessment, such that where an assessment complies with a particular standard the reader can have confidence in the result.
Specific errors associated with measuring heights and distances were discussed in the 2017 report as shown below

Height of Source and Receiver 0 – 5m
+ /- 3dB where distance from Source to Receptor is between 0 – 100m or 100 – 1000m

Height of Source and Receiver 5– 30m
+/- 1dB where distance from Source to Receptor between 0 – 100m
+/- 3dB where distance from Source to Receptor is between 100 – 1000m

Natural Screening
Owing to its location in a rural area, and the topography resulting from the historical quarrying operation, there is a considerable level of screening provided to the site by both trees and vegetation, and the quarry faces around the site. It is reported that the presence of trees and scrub can reduce the sound level by approximately -6 dB for every 30m of vegetation through which the sound waves have to travel.

The 2017 Report included a table giving conservative estimate of the potential noise reduction at Bangley Quarry due to sonic screening based on literature values and industry estimates. This was calculated as -18 dB, out of a potential maximum of -37 dB.

It was also noted in the 2017 report that where all screening reductions are omitted (a scenario considered to be entirely unrepresentative of the site characteristics), the Rating Levels at sensitive receptors were still below the +5 dB BS4142 threshold indicative of adverse impact. This is borne out by the 2023 Noise study looking at the fixed plant and using the worst-case scenario approach.
In the Main supporting document the applicant proffers that as part of the development the AD Plant highlights the noise reduction afforded by the concrete containment bunding and the geography of the quarry faces whilst also pointing out that Condition 8 in the Planning appeal notice States that:

"…a scheme of landscaping in the form of the provision of a tree and shrub planted earth bund to the north of the entrance of Bangley Quarry shall be submitted to and approved in writing by the Planning Authority."
adding that

"The formation of the bund and the tree and shrub planting comprised in the approved details of landscaping shall be carried out in the first planting and seeding season following the occupation of the buildings or the completion of the development, whichever is the sooner. The bund shall thereafter remain in place. If any of the new trees or shrubs die, are removed or become seriously damaged or diseased they shall be replaced in the next planting season with others of similar size and species, unless the Planning Authority gives written consent to any variation"

As a result, an earthen bund and additional tree line will exist between the plant and sensitive receptors. providing significant visual and audio screening

2023 PPC Noise Assessment Modelling Results

The assessment has been undertaken to establish the external worst-case noise levels from proposed fixed plant operating at the AD Plant. The assessment compares the noise levels associated with the fixed plant with the existing measured average background noise level LA90 at the closest sensitive receptors. In accordance with BS4142:2014 section 9.2, a +3 dB correction has been applied to create the 'Rating Level' at the receptor to account for any perceptible intermittency within the plant operations. The results of the assessment are summarised below

The 2023 Noise modelling results indicate:

1. That the potential noise contribution from the equipment and plant associated with the proposed AD installation will be below 41dB (A) during the day and 39dB(A) during the day night at the closest affected receptor.
2. That during the Daytime noise assessment Score at all Noise Sensitive Receptors (NSR) is < = 0 dB and that the Night-Time noise assessment Score, with respect to the prevailing background noise level, at the closest residential properties to the facility would be as follows-: Huntington Stable Cottage +4dB, Huntington West Lodge +4dB and R01 Garelton Lodge +1dB. The Night-Time assessment Score at other NSRs indicates a level of <= 0 dB
3. The result of the 2023 modelling assessment supports the finding of the 2017 Noise assessment submitted with the planning application for the Bangley Quarry AD Plant and which SEPA reviewed at the time.
4. The results of the 2023 modelling are "conservative" based on a worst-case scenario and do not include reductions due to screening etc.

Conclusion

The modelling from 2023 returned an indicative outcome of Noise predicted to be above the existing background noise level during the Night-Time at Huntington Stable Cottage (+4dB), Huntington West Lodge (+4dB) and Garelton Lodge (+1dB). The scores predicted are modelled on a worst-case scenario and are below the +5 dB reported in BS4142 as the threshold indicative of adverse impact. The details from BS4142 state that at R01-R05 there would be 'No noise, or barely audible or detectable noise' and at R06 and R07 there would be an 'Audible or detectable noise' which according to the table above is less likely to have an adverse impact. Where Audible or detectable noise is recorded appropriate measures must be taken to prevent or, where that is not practicable, minimise noise.

It was highlighted in the Noise assessments for Bangley Quarry AD Plant that the Noise plots/plans produced to accompany the tabulated dated showed that there was significant Noise screening afforded by the quarry faces which surround the AD Plant, and the vegetation between the noise sources and sensitive receptors. Therefore, given that the nearest residential property is located over 250m from the AD plant boundary and with the modelling data showing a low noise impact it would not be justifiable to impose additional noise abatement measures on the operator beyond that required under BAT as the noise levels are already below the relevant BS4142 level and may be significantly lower if the indications from both the 2023 and 2017 Noise assessment are correct.

BAT Assessment

Noise is covered in the following BAT Conclusions
General BATc: 1 4 5 17 18
Biological Treatment None
Anaerobic Digestion None
BATc 1, outlines the requirements for the operator to implement an Environmental Management System which includes a Noise Management Plan the purpose of which is to provide a framework for the ongoing management and review of noise management on the site. It should include procedures to investigate and timeously address any noise complaints (especially during night-time operations) and to drive continuing improvement to reduce the impacts of noise and vibration originating from the site.

BATc 4 and BATc 5 require the operator to introduce measures to reduce Noise from the storage and handling of waste, including instructions for staff related to the need for Noise reduction where possible. BATc17 places responsibility on the operator to periodically review the Noise Management plan with the purpose of preventing or, where that is not practicable, reducing noise and vibration emissions.
BATc 18 lists the measures to be used when looking to reduce Noise and Vibration from the site: inspection and maintenance of equipment; closing of doors and windows trained/experienced staff; limiting noisy activities at night; noise control during maintenance; from traffic; handling and treatment activities; positioning of equipment and buildings; use of Low-noise equipment; Noise and vibration control equipment; and general Noise attenuation around the site.

Noise Management Plan
SEPA will include a condition within the permit requiring the operator to produce, and maintain, a noise management plan, with the purpose of providing a framework for the ongoing management and review of noise; to investigate and timeously address any noise complaints especially during night-time operations at the site and to use Best Available Techniques to drive continuing improvement to reduce the impacts of noise and vibration originating from the site.

BAT Assessment
The application Submitted to SEPA contains a Noise Impact Assessment which has been undertaken using the Noise and Vibration Management: Environmental Permits guidance endorsed by the 4 UK Environmental regulators and issued July 2021. The assessment report which has been included in support of the application provides all the necessary information to be considered:

- The effect levels at sensitive receptors in relation to the closest corresponding BS 4142:2014+A1:2019 criteria for each defined level,
- A full list of Noise sources
- The closest receptors
- A description of the level and the actions required (dependant on the level)

The report shows the predicted Noise levels emanating from operational use of fixed plant and site vehicles impacting at existing receptors and has been produced using the CadnaA noise modelling software, using up to date information and incorporating ISO 9613-2 methodology calculation.

The report satisfies the requirements of the Noise and Vibration Management: Environmental Permits guidance covering the key elements necessary for a Noise report including the noise maps and plans with the emission points identified, the predicted movement of LGVs on the site, the ones pertaining to the site layout, the location receptors in the model, including, outdoor spaces, attractions, and the closest housing, and discusses tonal or low frequency noise generated by the site and includes NR Curves to cover the complete spectrum of noise frequencies.

A Full Noise Inventory has been provided with the application which includes details of the location, noise specification, and operational details of the plant identified, together with Measured distance between the plant and the SRs, and whether the plant is in the open or contained within a building.

The report details the uncertainties connected to the modelling, discussing each source of uncertainty and how this was minimised, applying the relevant corrections required under BS 4142 for tonal, and/or impulsive noise emissions.

Planning Permission / PPC Part A Interaction
Where an industrial site requires, and is granted, a PPC part A permit Noise emissions from the site become regulated and controlled through the permit. Where the BAT conclusions or BAT reference documents for a given activity exceed that required by the Planning Authority, SEPA will require the operator to meet the more stringent requirement under PPC/IED, otherwise SEPA will require that as a minimum the operator always meets the planning requirements,

The starting point for SEPA's assessment and control of the noise emissions from the site is the noise conditions attached to the planning permission for the Bangley Quarry AD Plant by the Planning Reporter following the site's Planning appeal (reference: PPA-210-2093) These state that:

The anaerobic digestion plant and associated development shall always operate in compliance with the following requirements:
(i) the Rating Level, LArTr, of noise emanating from any associated plant or machinery serving the proposed anaerobic digestion plant (when measured 3.5m from the façade of any neighbouring residential property) shall be no more than 5dB (A) above the background noise level, LA90T. All measurements to be made in accordance with BS 4142: 2014 "Methods for rating and assessing industrial and commercial sound";

(ii) noise associated with the operation of any plant and/or machinery within the anaerobic digestion plant and any other part of the development hereby approved shall not exceed Noise Rating curve NR20 at any octave band frequency between the hours of 2300-0700 and Noise Rating curve NR25 at any octave band frequency between the hours of 0700-2300 within any nearby residential property. All measurements to be made with windows open at least 50mm.

Further to this there is a general condition that restricts vehicle access to the site during the night-time period

No delivery vehicles shall access or egress the site between 1900 to 0700 on any day.

Planning Compliance
The Noise assessments carried out indicate that noise levels at nearest sensitive receptors do not result in an increase of more than 5dB(A) above the background noise level and do not exceed the Noise Rating Curves at any octave band frequency during either the Night-Time (NR20) or the Daytime (NR25) within any nearby residential property. As such, it is considered that the noise levels emitted by the Anaerobic Digestion facility comply with the Planning Noise requirements of the site's planning permission.

5.5 Resource Utilisation

Water use

Cleaning
Where cleaning or decontamination of pipework equipment and vehicles is required SEPA will require the operator to use Best Available Techniques to minimise the use of water on site

Process
No additional water will be added to the AD process, the digester feed will be blended using the liquid feedstock recycled water and recirculated digestate from the storage tank to provide the required liquid content in the digester feedstock.

BAT Assessment
Water Use is covered in the following BAT Conclusions
General BATc: 11 19

Biological Treatment BATc 35
Anaerobic Digestion None

BATc 11. Requires the Operator to monitor the annual consumption of water, at least once per year. The methods which can be used include direct measurements, calculation or recording, e.g. using meters, meter readings or invoices. The monitoring data can then be broken down to assess usage at Installation, process, or plant level, such that any significant changes in the installation/plant/process water use can be investigated.
BATc 35 and BATc 19 both outline the measures an operator should consider when optimising water consumption, the techniques outlined include several measures the operator should incorporate into both the design and operational management of the site to reduce potable water usage including the segregation of water streams, and the recycling of process/wastewater and surface/bund water

Energy use and generation

The Scottish Government Anaerobic Digestion Advice (for planning authorities) advises in the Technical Information "and guidance on typical issues associated with AD" that when determining applications and designing appropriate local solutions." states that One of the benefits is that *"The biogas produced from AD can be used to supply heating systems within the site or beyond its confines via heat mains, or it can be used for combined heat and power (CHP) schemes, displacing the carbon dioxide-producing fossil fuels which might otherwise be employed".*

Article 42 of the IED provides an exemption from the Chapter IV provisions for gasification or pyrolysis plants where "the gases resulting from this thermal treatment of waste are purified to such an extent that they are no longer a waste prior to their incineration, and they can cause emissions no higher than those resulting from the burning of natural gas". As a result, Biomethane of a standard which is suitable for injection into the Gas grid would be deemed exempt.

SEPA's position is that, while AD plants are not strictly thermal treatment plants, they should be included in SEPA's 2014 Thermal Treatment of Waste Guidelines "the 2014 guidelines" to require that where the biogas is used to generate electricity and heat this is carried out in the most energy efficient way. The 2014 guidelines provide a basis for assessing the efficiency of energy generation and utilisation generated during the treatment of municipal, commercial, and industrial waste by combustion, gasification, pyrolysis, plasma systems, and anaerobic digestion.

Electricity produced by the CHP will be used on site, to meet the site demand. Heat produced on the site will be used first in the AD and pasteurisation processes as required by the ABP Regulations.

The applicant has provided both a full Heat and Power Plan and a Mass & Energy Balance report as part of the supporting information accompanying the application, CHPQA Index calculation is given below

CHPQA Index – QI = 249*(0.421) + 113*(0.462) = 157.035 QI value is stated as not applicable for biogas boiler

SEPA's 2014 guidance states that the QI value is to be estimated and calculated in accordance with the relevant CHPQA method for that type of thermal treatment plant and fuel type and as a minimum meet or exceed the equivalent level specified in the following Table, adding that *Where a thermal treatment plant only provides heat or a fuel then SEPA would expect that the energy recovery indicative efficiency should be estimated and calculated and as a minimum meet or exceed the equivalent level specified that table*'.

Th heat and power plan targets given in the guidance states that the QI value should be above 85 with an Indicative efficiency 30% for all sites <= 70,000 tonnes/yr. and a QI value of 93 and an Indicative efficiency of 35% for all plants .70,000 tonnes/yr.

SEPA Conclusions

The applicable QI value and the indicative efficiency exceed the minimum requirements given in the Heat and Power plan table.

In producing the Heat and Power Plan submitted in support of the permit application, the applicant has based the plan on the heat and power plan format suggested in annex 2 of the 2014 guidance.

- Section 1: Description of the facility technology
- Section 2: Description of the waste to be treated and its energy value
- Section 3: Heat and power plan
- Annexes: Any supplementary information referred to in the submitted plan

The plan submitted provides details of how the energy produced by the facility will be utilised and includes information regarding design estimates and heat uptake forecasts.

SEPA will review the heat and power plan periodically to assess progress in meeting the energy recovery objectives and could, if necessary, amend the permit accordingly.

The timescale for implementation of a heat and power plan will normally be between five and seven years, with this timescale starting on cessation of commissioning of the facility.

Additional Energy efficiency measure
The applicant has outlined the measures and procedures will be put in place to facilitate efficient use of energy throughout the process such that: All motors and drives are sized appropriately; All equipment not in use, including low energy lighting is switched off when not in use; that all plant connected with the generation, use, conveyance and storage of heat or heated materials will be insulated (including the digesters and pasteurisation vessels) to minimise heat loss. Where appropriate heat exchangers will be used during the process to recover reuse any excess heat.

The installation is not part of a Climate Change Agreement.

BAT Assessment
Energy use and generation is covered in the following BAT Conclusions
General BATc: 11 23
Biological Treatment None
Anaerobic Digestion None

BATc 11. Requires the Operator to monitor the annual consumption of Gas and Electricity, at least once per year. The methods which can be used include direct measurements, calculation or recording, e.g. using meters, meter readings, or invoices. The monitoring data can then be broken down to assess usage at Installation, process, or plant level such that any significant changes in the installation/plant/process energy use can be investigated.
BATc 23 requires the operator to produce an Energy Efficiency Plan and keep a record of the Energy Use and Energy balance on the site.

Raw Materials Selection and Use

The main raw materials are the feedstocks to the digester and the associated chemicals, fuels, oils and reagents required to facilitate both the operation of the AD plant and the biogas upgrade system.
The applicant in the supporting documentation describes how the feedstock materials will include both specifically grown “energy” crops and a limited number of waste types which are described as being “agricultural” in nature (and include Animal by-products) ,“green waste” or originating from parks gardens and markets and wastes associated with the brewing, distilling and malting industries. These wastes require to be mixed to mixed to provide an optimal feedstock for the digester. Planning restrictions

exclude the site from accepting and treating commercial or domestic food waste (either as a collected fraction or pre-packaged) and as such there is a defined list of waste types which can be accepted onto the site.

The table below details the main raw materials and how and why they are required to be used:

Table – Materials and Risk Assessment

Raw material and chemical composition	Use	Storage location and capacity	Quantities used	Fate of the material in the installation (i.e. approximate percentages to each environmental medium and to the products	Environmental impact (e.g. degradability bioaccumulation potential, toxicity to relevant species);	Reasonably practicable alternative raw materials	Justification for the continued use of any substance for which there is a less hazardous alternative
Potable Water	Heat exchanger,	Contained within the heat	Minimal once heat	Retained in the hot water	None	None	No reasonable alternative
	CO_2 recovery process. Also to top up rainwater harvesting tank, when levels low, for use as wash water.	exchanger pipe work, CO_2 recovery and AD cycle. If used for washing, will be contained within sealed drainage system.	exchanger pipework filled	pipework. Where necessary drained into the contained site drainage and returned to the AD process.			
Biogas	Combustion fuel	Gas holders. standard operating pressure	1250m^3/h	Some combustion products to air, mostly cleaned of CO_2 and injected to gas grid	Combustion product CO_2 is a greenhouse gas. +ve effect of grid injection as displacing fossil fuel gas with renewable gas.	None, the biogas is the purpose of the whole facility.	Renewable energy under the OFGEM tariffs. Provides green energy for houses.
Anti-freeze (ethylene glycol or similar)	To protect cooling system on CHP from freezing and for use in condensates in extreme weather	~75 litres stored internally on bunded pallet	Negligible quantities	Any releases will be collected in the site contained drainage system and returned to the AD process for treatment	Readily degradable under the conditions in the anaerobic digester.	None	No reasonable alternative
Lubricating Oil	Engine Lubrications	2000 l inside CHP container	12,045 litres/year	Recovered, re-used and disposed	Negligible	None	No reasonable alternative
Ferric Chloride	Process additive to	Stored in 1000l IBC's internally	50m^3/ yr	100% into the AD process.	The products of the precipitation	None	Control of H_2S in the biogas
	reduce H_2S production on the digestive process			Sulphide precipitates out as a solid into the digestate.	process in the digester are recycled to land as part of the digestate. No detrimental effect.		
Process Additive	Reduce H_2S levels and improve biological health	Stored in containers internally		Additives are consumed by the biological processes and remain within the digestate.	Innocuous to aquatic life in doses up to 200g/l.	None	Addition improves the process. No reasonable alternative.
Active Carbon	Cleaning contaminants out of gas and from air extracted from reception building	Stored in containers or within specific champers of the process equipment.	30 tonnes / year (dependent on feedstocks)	When fully spent these are collected from site for specialist disposal / recycling	Negligible	None	Required for odour mitigation cleaning of gas to grid specification and to protect the lifespan of other site equipment.

As a SWMA, the waste derived raw materials which can be accepted on the site for treatment are restricted to the waste types (EWC codes) listed in the Permit (in the case of Bangley Quarry AD plant taking into account the planning restrictions imposed on the site).

The defined nature of the AD biological process means that to maintain the efficient operation of the digesters, the operator will be required to select the correct mix of feedstocks with which to feed the digester, whilst avoiding inhibitory substances and the entry of materials which could have a detrimental effect on the treatment process.
The applicant has advised that facilities have been provided so that waste can be inspected, and if necessary sampled, and that certain waste types will only be accepted from known producers and specified sources. The implementation of a robust waste acceptance criterion will ensure that the waste types accepted are suitable for treatment within the digestion process.
Should the operator wish to take in a new waste stream, SEPA would require that prior to its introduction into the AD plant the operator shall carry out a technical assessment to show it is suitable for treatment in the AD Plant.
The procedure for undertaking this is described in SEPA Technical Guidance Note 38 (SEPA TGN-038) which states that *"the applicant is required to undertake sampling of every load of a new waste stream for the first month of acceptance, relaxing to once every three months thereafter. The frequency, number of samples, and the parameters tested for will be based on the variability of the feedstock and the process from which it arises. All sampling checking and analysis of waste streams will only be undertaken by a member of staff who is suitably qualified and trained*."

BAT Assessment
Raw Materials Use is covered in the following BAT Conclusions
General BATc: 2 11 22
Biological Treatment BAT 33
Anaerobic Digestion 38

BAT for the Selection of Raw materials is detailed in BATc 38, BATc 33, and BATc 2, these require the operator to select Raw materials which are suitable to feed the digestion process taking into account nutrient balance, moisture, or toxic compounds which may reduce the biological activity. Building on this requirement is the monitoring and/or control of key waste and process parameters, which requires the operator to ensure that feedstocks into the digester ensure the correct pH, alkalinity, moisture/liquid content, and the volatile fatty acids (VFA) concentration are available to maintain a stable digester operation. These Raw materials inputs require to be tracked and recorded.

The use of raw materials within the digestion process is split into the substitution of virgin materials with waste under BATc 22. The digester at Bangley Quarry is configured to accept and digest both waste and virgin raw materials (e.g. Energy crops) for the generation of biogas and production of PAS110 standard digestate. And the requirement to monitor Raw material Usage under BATc 11 which requires the Operator to monitor the annual consumption of Raw Materials, at least once per year. The methods which can be used include direct measurements, calculation, or recording, e.g. using meters, meter readings, or invoices, including in the case of feedstock, weighbridge tickets. The monitoring data can then be broken down to assess usage at Installation, process, or plant level, such that any significant changes in the installation/plant/process through addition of raw materials use can be investigated.

5.6 Waste Management and Handling

Waste Minimisation

The Bangley Quarry Site receives a limited range of "green" biodegradable wastes which have been diverted from other disposal and recovery options. The restriction on the acceptance of general municipal waste and pre-packaged food waste means that the amount of waste generated through pre-treatment is minimised. The design of the digestion plant and the limited and controlled processing of "green" waste and energy crops, produces both methane-based biogas and residual solid and liquid fractions which is of a quality to meet the PAS110 standard considered to be a by-product suitable for use as a fertiliser substitute.

A robust waste acceptance procedure, and limited range of input materials, will ensure contaminants which could interfere with the digestion process are screened out prior to introduction into the AD process thereby reducing the risk that the contents of the AD plant need to be disposed of.

BAT will be used to minimise waste production on site through the identification and implementation of waste prevention measures e.g. reminding staff of the need for waste reduction, undertaking reviews of process efficiency, and reviewing materials' usage. BAT also requires the operator is to undertake regular waste minimisation audits, the findings of which are to be recorded and made available to SEPA upon request. The audits will cover site efficiency, change in process, and waste reduction, and highlight and recommend any areas for improvements.

Where necessary SEPA will include conditions within the permit to encourage waste minimisation throughout the activity including requirements to assess the management of waste arising at the site.

BAT Assessment
Waste Minimisation is covered in the following BAT Conclusions
General BATc: 1 4 5 11 22 24
Biological Treatment None
Anaerobic Digestion None
BATc 1, BATc 4 and BATc 5, and Section 6.5 of the BAT conclusion Document (Management Techniques), outline the requirements for the operator to implement an Environmental Management System with fully documented procedures to record what materials are produced on site. The avoidance of waste generation through spills and accidents and production of off-spec digestate is key to minimising waste production on the site as meeting the PAS110 standard certifies the digestate as a product not a waste. Section 6.5 details the requirement for a Residue management plan and outlines what that plan should include. The operator is required to minimise waste on site, which is required to be monitored under BATc 11, this BATc details how the operator is required to monitor residue generation on the site at least once per year to give the tonnes of each waste stream produced. As stated, the operator should be looking to reduce waste outputs wherever possible.

Waste Handling

All producers of waste have a Duty of Care to ensure that waste generated on their site is handled and stored appropriately (Including the provision of bunding or drip trays or storage in a dry and secure area if necessary).

BAT Assessment
Waste Handling is covered in the following BAT Conclusions
General BATc: 1 4 5 13 14 21
Biological Treatment None
Anaerobic Digestion None

BATc 1, BATc 4 and BATc 5, and Section 6.5 of the BAT conclusion Document (Management Techniques), outline the requirements for the operator to implement an Environmental Management System with fully documented procedures to record what materials are produced on site. These BATc outline the requirement for Training and competency of staff, correct and safe waste handling and storage, and require spill, accident, and incident procedures to be put in place.
Section 6.5 details the requirement for a Residue management plan and outlines what that plan should include.
BATc 14 lists several measures the operator should use to prevent or reduce emissions to air of odour from waste materials (solid and liquid digestate). The BATc14 points out that BAT 14d covering Containment, collection, and treatment, of diffuse emissions is especially relevant.
This includes during the treating, handling, and storing, of wastes produced on site that may generate diffuse emissions. It recommends operations are carried out in enclosed buildings collecting and directing the emissions to an appropriate abatement system (see Section 6.1) via an air extraction system and/or air suction systems close to the emission sources.
During loading of liquid wastes this could include the utilisation of on-board venting and abatement systems where they are fitted to road tankers.

Waste Recovery or Disposal

Overview
The aim of the Bangley Quarry development is to take in waste, which would otherwise be disposed of, and recover it using Anaerobic Biological treatment in an AD plant such that only Biogas/Biomethane and PAS110 digestate and solids "by-products" are generated on site.

Off Specification Digestate/solid waste
The applicant has identified that the main potential source of waste generated on site would be off spec "waste digestate" or "waste solids" (i.e. digestate and solids which do not meet the PAS110 standard). This would include residues generated from the drawdown of the AD tanks for cleaning, inspection, or maintenance. Where these materials are unsuitable to be returned to the process for further treatment, the applicant has indicated that they will apply the waste hierarchy and wherever look to avoid disposal by sending these wastes for "beneficial use" and "recovery." This could include transfer to another AD site for further treatment, testing prior to being spread to land under a relevant waste management exemption (not required for PAS110 standard digestate) independently or together with a PAS110 digestate disposal will be a final option. As there are no discharges to the water environment either directly or indirectly (via a sewer system) then an inventory of wastewater is not relevant The sending of off spec digestate for disposal by tanker would constitute "waste in liquid form" which would require the load to be accompanied by documentation describing the contents and accompanied by analysis where required these records would be unique to individual loads of waste.

Non-AD derived wastes
The applicant has identified the following waste streams which are incidental to the AD process and has provided an outline of how they are to be recovered or disposed of: -

Waste	Quantity	Destination
Active Carbon	*ca* 30 Tonnes/yr. (dependent on feedstocks) Plus Odour Control Unit (use undeterminable)	Removed by external contractor for specialist disposal/recycling
Domestic Waste	<= Ave 6-person household	Landfill Site via truck collection
Maintenance Waste	Undefined	landfill or recycling as appropriate

Carbon filters
Under waste minimisation and the waste hierarchy the operator should periodically review the type of carbon filters they are using and look to replace those requiring disposal when spent with recyclable or rechargeable ones when, or if, they become available.

Waste Oil
The operator is reminded by SEPA that where measures should be taken to ensure that waste oils of different characteristics are not mixed, and waste oils are not mixed with other kinds of waste or substances, especially if such mixing impedes their treatment. SEPA would also advise that non-edible waste oils are always classed as hazardous waste and as such in Scotland they require to be consigned under the Special Waste Regulations 1996 (as amended)

The operator has a duty of care to ensure that any wastes they generate on site are handled and stored in appropriate containers such that it does not escape the boundary of the site, including where necessary bunded areas for the storage of any liquid waste materials. The operator should also ensure that any wastes leaving the site are only transported by a registered waste carrier and are disposed of to a suitably licenced recovery or disposal facility.

BAT Assessment
Waste Recovery and Disposal is covered in the following BAT Conclusions
General BATc: 1 11 22 24 Section 6.5 in the BAT Conclusion Document

Biological Treatment None
Anaerobic Digestion None

BATc 1, and Section 6.5 of the BAT conclusion Document (Management Techniques), outline the requirements for the operator to implement an Environmental Management System with fully documented procedures to record what materials are produced on site. Section 6.5 of the BAT Conclusion Document details the requirement for a Residue management plan and outlines what that plan should include. BAT11 details how the operator is required to monitor the annual generation of residues on the site at a frequency of at least once per year. BATc 11 requires the Operator to monitor the annual consumption of Raw Materials, at least once per year. The methods which can be used include direct measurements, calculation or recording, e.g. using meters, meter readings, or invoices, including in the case of feedstock, weighbridge tickets. The monitoring data needs to be capable of distinguishing between types of material produced, liquid and solid, pasteurised/PAS 110 certificated digestate or uncertificated digestate, and other wastes generated on site as part of the process, including those wastes re introduced into the AD process under BATc 22 and BATc 24 and the residue management plan. The Data should record the tonnes of each waste stream or residue produced in the Installation, process, or plant, such that any significant increase in wastes can be identified and potential problems with the installation/plant/process investigated

5.7 Management of the site

Environmental Management System

The Bangley Quarry AD plant will be operated and managed under the Integrated Management System (IMS) certified, ISO 14001 standard environmental management system, and produce PAS-110 compliant by-products, full details of which have been submitted to SEPA in support of the application.

The EMS document submitted covers all aspects of the operation of the AD plant and is designed to ensure that: the risks to the environment from the AD plant are identified, measures to minimise those risks are implemented, and that the performance against the EMS is regularly audited.

This EMS document contains details of the proposed Operations and Maintenance regime at the plant, employee training records and requirements, performance analysis, and a complaint reporting and investigation procedure.

COTC Requirement (SWMA)
Before granting a permit for a Specified Waste Management Activity (SWMA) SEPA must be satisfied that the applicant is a “Fit and Proper” person and that this assessment requires that the person, and all staff engaged in carrying out the activity have been provided with adequate professional technical development and training, AND that the management of activity will be in the hands of a technically competent person.
Details provided by the applicant identified named individuals who hold the required WAMITAB level 4 qualifications. These persons are considered by SEPA to hold Certificates of Technical Competence “COTC holders” without a requirement to undertake any further competency checks

In the event of a COTC holder leaving the company then the operator should notify SEPA and must ensure that a suitably qualified and technically competent replacement is appointed, or that a temporary arrangement is in place such that site continues to be managed appropriately. Furthermore, it is important that any COTC holder appointed for the site has sufficient authority to recommend, implement, and influence, changes to waste operating process or procedures as and where necessary.

SEPA Conclusions
Implementation of, and adherence to, an accredited Environmental Management System is identified as BAT in the Waste Treatment BREF and Relevant BAT Conclusions. SEPA would therefore expect the site operators to maintain certification of the Environmental Management Systems at Bangley Quarry to ISO14001 or equivalent.

Where it appears to SEPA there is a lack of COTC cover for the site then the operator may be required to implement changes to ensure that additional COTC cover is provided to comply with requirements of the 2012 Regulations.

BAT Assessment
Noise is covered in the following BAT Conclusions
General BATc: 1
Biological Treatment None
Anaerobic Digestion None
BATc 1 outlines the requirements for the operator to implement an Environmental Management System with fully documented procedures to record all aspects of the operation of the site this includes internal and external reporting procedures, Management and training records, accident and emergency procedures, environmental monitoring plans, data returns, waste inventories etc.

The key elements covered in a BAT compliant EMS system must include the following additional reports:

X. waste stream management (see BAT 2);
XI. an inventory of wastewater and waste gas streams (see BAT 3);
XII. residues management plan (see description in Section 6.5);
XIII. accident management plan (see description in Section 6.5);
XIV. odour management plan (see BAT 12);
XV. noise and vibration management plan (see BAT 17).

As indicated above the specific issues covered within the EMS are impacted by other BATc and as a result have been dealt with within the individual sections of the decision document pertaining to the specific Activity or DAA carried out.

Accidents and their Consequences

Overview
The EMS documentation submitted with the application outlines the system at Bangley Quarry for preventing accidents from occurring and ensuring measures are in place to mitigate any subsequent environmental impacts. The EMS contains an accident risk assessment detailing the potential causes, and locations of accidents which could impact the environment, looking at the impact, risk and mitigation measures, which could be employed. This risk assessment outlines the accidents which could occur during the operation of the Bangley Quarry Biogas plant.

The EMS system contain measures designed to minimise the potential causes and consequences of accidents. They include several measures related to the operation of the site:

- maintaining a list of substances that would harm the environment if they were to escape;
- Undertaking compatibility checks on raw materials and waste to ensure there are no adverse reactions;
- Measures to securely store raw materials, products and wastes to prevent their escape into the environment;
- introducing measures to prevent vehicles damaging equipment;
- providing primary and secondary containment to prevent the escape of potentially polluting materials;
- site security measures to minimise the risk of unauthorised access;
- maintaining a log of all incidents and near misses;
- defining responsibilities for managing accidents;
- maintaining clear instructions on the management of accidents; and
- maintaining appropriate equipment to limit the consequences of an accident.

Accident prevention
Staff are encouraged to report actual or potential non-compliances to the Site Manager, safety representatives, or raise them during team meetings. These will be investigated and where appropriate

these will be rectified such that future or potential occurrences are prevented. To ensure a record is kept the EMS contains written procedures for recording accidents (including “near misses”),
Further procedures are in place to cover the handling, investigating, communicating, and reporting, actual or potential non-compliance with operating procedures or emission limits, processing environmental complaints and how these have been dealt with, including details of any corrective measure or action taken.

The applicant has intimated that suitable Lightning Protection has been fitted to the Biogas Plant. Whilst this is not a requirement, nor is it controlled under BAT it has become an emergent issue within the AD and biogas industry. SEPA would recommend that this system is monitored and maintained in a good state of repair. SEPA also ask the operator to consider whether electrical surge protection is worth installing to protect key process critical control equipment from both interruption and damage during lightning. The EA reported that at one AD Plant “*The strike interrupted both solid feeders and various other electrical components, but the flare and CHP reactivated so no venting of gas from other tanks. Strike affected internet supply in the upgrading plant and some hardware*. These devices are not only useful in minimising the effects of lightning strikes on the public and the environment they could save the operator money in terms of repair and replacement of infrastructure and equipment but also the costs associated with downtime.

General Safety
All visitors to the site will be required to wear suitable hi visibility clothing and appropriate safety gear and follow any designated signage or delineated walkways whilst on the site.

Traffic Accident Prevention
A significant number of different types of vehicles are expected to enter and leave the site and traffic management is required on site to prevent the inherent risk of an accident occurring due to vehicles turning and reversing into and between plant.
The applicant has provided an overview of the measures which have been designed to minimise the risk of accidents and damage from vehicle movements and has advised that within the site boundary, all vehicles will be presented with clear directions dependent on the type of vehicle and its purpose on-site.

Cars/PLG Vehicles
The applicant has outlined that to improve vehicle safety on-site it is their policy to require that all cars entering the site will proceed to a designated car park located near the Site entrance whereupon they will be requested to reverse park within the designated bays provided. This minimises the number of vehicle movements within the main site and reduces the risk of vehicle incidents.

Tankers and Lorries (HGV/LGV), and Tractor Trailers
The applicant has outlined that HGV, and tractors with trailers, will enter the site on a day-to-day basis to perform one of three activities:
• The delivery of solid feedstocks to the process building
• The delivery of liquid feedstocks to the import tanks
• The removal of digestate from the ‘take-off’ points

The applicant has identified that as these activities are not mutually exclusive it may be the case that multiple vehicles are on-site and operating in proximity at busy times during the daily operating time 07:00-19:00. The layout of the site has been planned in a way which allows feedstock delivery and digestate removal to occur simultaneously, such that vehicles delivering feedstock will reverse into the process building, or up to the location of the import tanks, depending on the nature of the vehicle and the feedstock being delivered. Manoeuvring areas have been planned to ensure that clear access will always be maintained to the digestate take-off points with what is described as an “adequately” sized turning circle being constructed so that reversing at that point of the site is not required.
The applicant points out that as the manoeuvres required for delivery and removal will occur in separate areas of the site, this will limit congestion and reduce the risk of vehicle incidents occurring.

Accident Response

The applicant has outlined that should an accident or incident occur on the site then the Accident Management Plan would be implemented to ensure any incident is dealt with in the most appropriate way. As soon as practicable after an accident, an analysis of the reasons why the accident occurred and whether the response was adequate will be undertaken. Following the accident review, where any improvements are identified these will be implemented and the accident plan revised to reflect those improvements.

BAT Assessment
Accidents and Incidents are covered in the following BAT Conclusions
General BATc: 1 and Section 6.5 in the BAT Conclusion Document
Biological Treatment None
Anaerobic Digestion None

BATc 1 outlines the requirements for the operator to implement an Environmental Management System with fully documented procedures to record all aspects of the operation of the site this includes the Accident Management Plan outlined in Section 6.5 of the BAT conclusion Document entitled *"Management Techniques".* These documents include the procedure for reporting environmental accidents or incidents, (including near misses), and the procedures for addressing any issues raised by staff, contractors, and third parties, accident and incident response, site security, and training traffic management. Bangley Quarry has intimated there will also be in place a disciplinary and sanctions policy for actions which result, or could result, in an accident or incident (covering staff, contractors and visitors to the site).

There are several of the BATc which are designed to reduce the risk of accidents e.g. safe handling of materials procedures for the storage of liquids etc. these are discussed in the individual sections of the report.

Closure

Planning Permission Closure condition
A condition has been added to the planning permission by the reporter "*To ensure that any development which has ceased to serve its intended purpose is removed from the site, in the interests the amenity of the area."* Then the following condition would apply

"Should the anaerobic digestion plant hereby approved not supply gas for a continuous period of 12 months, it shall be deemed to have ceased to be required and, unless otherwise agreed in writing by the Planning Authority, shall be removed from the site, along with all associated plant and equipment. Within one month from the removal of the anaerobic digestion plant and all associated plant and equipment, details of the restoration of the cleared digestion plant site, including a restoration timetable, shall be submitted to and approved in advance by the Planning Authority. The cleared digestion plant site shall thereafter be restored in accordance with the details so approved."

PPC Site Closure Requirements
Regulations 48 Surrender of a Part A permit, and Regulation 50 Revocation of Part A permit, describe what is required in the event operations on the site permanently ceasing or following site closure. In the case of a SWMA, SEPA would require the operator to clear the site of residual waste and submit a Site Closure report. There is no requirement on the operator under PPC Part A to remove site infrastructure which would be present prior to the site being operational under PPC.

The Site closure report must describe the condition of the site affected by the surrender (the "closure report"), identifying any changes from the condition of the site as described in the site report, and where applicable, the baseline report. The closure report must also provide a detailed descriptions of the steps that have been taken to avoid pollution risks from the site during its operation, include details of the measures taken to return the site to a satisfactory state, and to remove, control, contain, or reduce, any relevant hazardous substance in soil and groundwater.

Satisfactory State

SEPA guidance states that the regulations do not provide a definition of the term “satisfactory state,” its use in the regulations alongside the “pollution risk” would indicate it means something different. The ethos of Pollution Prevention and Control is to prevent a deterioration in the site condition. such that a deterioration of soil and groundwater during the lifetime of the Installation could be unsatisfactory and require some form of remediation to return it to a “Satisfactory State even if there is no pollution risk to an identifiable receptor e.g. the removal of sludge from a bund which was not originally on the site, it may be safely contained but would not return the site to the point before the activity started. To resolve this general housekeeping issue, the bund would need to be cleared of sludge and where necessary cleaned.

5.8 Site Condition and Baseline report

Site Report

The Site Condition report provided with the application contains a review of the available information for the site. This includes historical use data and any previous monitoring information drawn from several relevant sources, SEPA, Local Authority, Coal Authority, etc.

The important features of the site are identified in the site report as follows; the site of the installation lies within the former Bangley Quarry which Nature Scotland designate to be a Site of Special Scientific Interest (SSSI) for its geological features and there is an area of designated Ancient Woodland (long established of plantation origin) located immediately adjacent to the site entrance.

Planning records indicate that along with the Quarrying operations which were historically carried out on the site, planning permission was granted in 2004 for an aggregate recycling facility within the boundary of Bangley Quarry Under which the following materials were approved to be recycled at the facility; Construction and demolition wastes, trench excavations spoil, road plannings, glass, spent railway ballast, Colliery spoil, Power station and Incinerator ashes, Blast furnace/steel slags, and Foundry sand. It is uncertain if or how long the site was used as an Aggregate Recycling Facility.
The Cyber-attack on SEPA in 2020 means that licensing information and electronic file notes from the time have been lost. Although the applicant has confirmed that all aggregate recycling stockpiles have been removed from site, and that there were no Relevant Hazardous Substances, nor substances which represent a Theoretical Pollution Risk it is recognised that the former aggregate processing facility has the potential for relevant hazardous substances to be present in any remaining soils and groundwater. Data from the Coal Authority indicated there were no records of coal workings in the area.

The PPC Permit Site Report requires the applicant to investigate and determine which strata and groundwater bodies could be affected by any emissions. A review was made of the information contained within several published geological documents. It was reported that no site investigation works had been carried out at the site. The information provided from Published geological records indicated that the natural superficial deposits surrounding the site were Glacial Till, adding that the quarrying activities are likely to have removed these and there may be a surface covering of crushed bedrock across the site. Underlying the site is volcanic basaltic and trachytic lavas and tuffs belonging to the Garleton Hills Volcanic Formation, Strathclyde Group which is Carboniferous in age. As this has been quarried at the site it will lie close to the surface.
Groundwater is absent except close to the surface as the volcanic rocks beneath the site are impermeable rocks. SEPAs Water Environment Hub Interactive Map shows the site located on the edge of the North Berwick Bedrock Groundwater Body, which has an overall Poor status. Quarrying to the south of the site has exposed the Haddington Bedrock Groundwater Body reported by SEPA as having an overall good status.
The general topography of the area indicates that surface water flow in the vicinity of the site would flow to the south and southwest, i.e. towards the quarry excavation and site access. Historically there was a drainage ditch to the west however there is no trace of the ditch now.

The primary hydrological feature, and closest monitored surface waterbody, is the Back Burn 1.5km to the south and flowing west to east (a tributary of the River Tyne 2.5km to the Southeast). This watercourse has moderate water quality and ecological potential, and physical condition, high water

flows and levels, with a poor ecological potential status. The former quarry excavation immediately to the south of the site is filled with water.

The applicant discusses the three main pollution receptors summarised as follows:

Surface Water
The general topography of the area indicates that surface water overland flow in the vicinity of the site would flow to the south and southwest, towards the quarry excavation and site access. The former quarry excavation is present immediately to the south of the installation which is infilled with water following the cessation of pumping, no outfall from the quarry has been identified

Bedrock Aquifer
Due to the quarrying activities the bedrock lies close to ground surface and comprises volcanic basaltic and trachytic lavas, and tuffs belonging to the Garleton Hills Volcanic Formation. Limited granular hardstanding may be present overlying the exposed rock. The extrusive volcanic rocks are noted to be impermeable and without groundwater except at a shallow depth. It is recorded that the groundwater body consists of a low productivity aquifer in which flow is virtually all through fractures and other discontinuities. Small amounts of groundwater were identified near surface weathered zones and secondary fractures.
The bedrock, highly fractured due to quarrying, is recorded having a Low to Moderate permeability with the flow through fractures.

Groundwater
The site is located on the southern edge of the 'Poor' status, North Berwick Bedrock Groundwater Body, The quarry to the south has exposed the 'Good' status, Haddington Bedrock Groundwater Body

The applicant states that due to the thin or absent soil cover currently at the site the aquifer has been assessed as being vulnerable to rapid impact from most water pollutants therefore the vulnerability of the aquifer to pollution has been assessed in accordance with the SNIFFER screening methodology

This indicated that assessed vulnerability code as 2 vulnerable to some pollutants only when continuously discharged /leached

The site report also requires the applicant to detail the potential sources of emissions and include details of how these will be mitigated for Bangley Biogas these are summarised below.

Potential Sources
There are 3 fermenter tanks and one large digestate storage tank within the tank farm located in the northern part of the installation together with a feed hopper, pasteurisation tanks, ferric chloride tank, and pump room.

These tanks are all located within a bunded area which will have a concrete hardstanding base. The containment floor and walls are designed to liquid retaining concrete specifications in accordance with British Standards BS 8110, BS 8500-1, as well as the CIRIA C736 containment design guidance. The perimeter bund walls are designed with a concrete toe which joins to the fibre reinforced concrete containment bund floor, to achieve a fully watertight retaining structure. The joint formed between the wall and the toe will be waterproofed. Within the bunded tank farm area, surface water will be directed towards a sealed drainage system.

The applicant has stated that there may be a thin layer of gravel hardstanding beneath the concrete base overlying shallow bedrock. The Process building and inside feed hopper lie immediately to the west of the tank farm. Silage Clamps are also present within the building. The process building lies within the bunded lined hardstanding area. This process building has sloped concrete flooring and sealed drainage system which drains back to the tank farm via pasteurisation. From the tank farm and process building there is no route for spillages to watercourses or ground.

Site Report Summary
The pollution risk at the Anaerobic Digestion (AD) Plant at Bangley Quarry are summarised as follows:
The Tank Farm, feed hopper, pasteurisation tanks, ferric chloride tank, and pump room, are located within a newly constructed, fully sealed, bunded area with concrete base and sealed drainage system that collects waste effluent tank in case of spillage.
The Process Building, which stores the feedstocks and includes an inside feed hopper and silage clamps has a sloped concrete floor with a sealed drainage system that issues to the bunded tank farm. The process building also lies within a newly constructed, fully sealed, bunded area, with concrete base which has a sealed drainage system that collects to a waste effluent tank in case of spillage. As this area is an enclosed building, there is no pathway to a surface water receptor.

Any failure of these systems has the potential contaminate, one or more of the following: the surface water within the former quarry excavation, the underlying bedrock aquifer, and the underlying groundwater.

Any leakages from storage inside the CHP container in a tank will be contained by appropriate bunding. Failure of tank and containment in this system could lead to potential contamination of the surface water ditch at the site entrance, the underlying bedrock aquifer, and the underlying groundwater.

Conclusion
The site report concluded that having considered the information collected for the site report it was considered that a Baseline Assessment was appropriate and as such the Applicant submitted a Baseline Report in support of the application.

Baseline Report

Where a PPC activity involves the use, production, or release of relevant hazardous materials, which could impact on Soil or Groundwater then it is a regulatory requirement that a baseline report be submitted with the application. This report must provide soil and groundwater measurements for the site and can be based on previously existing information if that information provides an accurate description of the state of the site at the time of the report. In producing the baseline report the regulations only require the applicant to have regard to soil and groundwater contamination by those hazardous substances used, produced, or released by the installation.

The Bangley Quarry Baseline Report describes the site as follows: Bangley Quarry is an existing industrial site subject to excavation and workings, adding that, there were no soil and groundwater measurements for the site and the applicant was required to undertake new monitoring.

Baseline investigation 2023

Overview
The site of the installation covers approximately 2ha of ground within the former Bangley Quarry. Access to the installation is from the south west and the main part of the former quarry excavation is located to the south of the installation. The former quarry excavation is filled with water. The former quarry face forms the northern boundary of the installation.
In general, the site of the installation is located on the western flank of a topographic high point, formed by the underlying bedrock geology which has been exploited and altered by the quarrying activities.
Limited ground profiling works have been undertaken prior to construction of the installation and the former infrastructure associated with the quarrying activities have been removed. Immediately to the north of the installation site are rock cliffs remaining from the previous quarrying operations.

Boreholes

Five boreholes (BH01 to BH05) were sunk, outwith the containment facility, to a depth of between 10 metres below ground level (mbgl) (BH01, BH03, BH04 and BH05) and 20mbgl (BH02) to provide information on the general nature and distribution of shallow soils and depth to bedrock around the perimeter of Biogas Facility. The location of these boreholes is described below together with the reason the location was chosen.

BH1 is located adjacent to the Process Building where there is the potential for contamination arising from storage and transfer of feedstocks and the generation of ammonia within leachate.

BH2 is located down hydraulic gradient from storage tanks & gas treatment area where there is the potential for contamination arising from transfer of feedstocks, generation of ammonia within leachate and treatment with ferric chloride.

BH3 is located down hydraulic gradient of storage tanks, adjacent to attenuation tanks and is between the installation and quarry lagoon. There is the potential for contamination arising from transfer of feedstocks, the generation of ammonia within leachate, and treatment with ferric chloride. There is also the potential for detergents and solvents to be present in drainage system.

BH4 is located between the installation and quarry lagoon and is down hydraulic gradient of storage tanks, separation/extraction station, filling station, and pumproom. There is the potential for contamination arising from transfer of feedstocks, the generation of ammonia within leachate, and treatment with ferric chloride.

BH5 is located between the installation and quarry lagoon and is down hydraulic gradient of Process Building and storage tanks. There is the potential for contamination arising from storage and transfer of feedstocks and the generation of ammonia within leachate.

The locations of these boreholes have been marked on the aerial photograph below.

Physical Constraints
The scope of the investigation was limited by the presence of shallow bedrock, the extent of the site boundary for the Biogas Facility, the extent of the construction associated with the installation, the presence of potentially unstable former quarry rock faces and the lagoon associated with the former quarry.

Summary
The report gives a detailed record of the findings together with relevant borehole logs strata recorded these can be summarised as under three headings “Made Ground,” “Weathered Bedrock” and “bedrock” as follows.

Made Ground
Made ground comprising crushed rock was encountered at all borehole positions and varied between 0.20m thick (BH01 and BH03) and 2.70m thick (BH05). This stratum was recorded to be present above rockhead in BH03, BH04 and BH05. At the location of BH01 and BH02 the crushed rock was overlying made ground comprising very gravelly/sandy clay or compacted fill with occasional boulders. varying in thickness between 1.6m (BH01) and 7.3m (BH02). Made ground extended to the rockhead and no natural superficial deposits were encountered.
Samples of the made ground were recovered from the boreholes.

Weathered Bedrock
In the northern part of the site adjacent to the former quarry face, weathered bedrock was encountered at rockhead in BH01 and BH02. The strata were described as ‘badly decomposed granite’ or ‘granite with softer layers. In BH01 the stratum was encountered at 1.8mbgl and extended to the base of the hole at 10mbgl and in BH02 the strata were encountered at 7.7mbgl and extended to the base of the hole at 20mbgl

Bedrock
In the southern part of the site, away from the former quarry face and, close to the quarry lagoon, the bedrock was not weathered, and a thin upper zone was noted to be fractured. This zone was 0.4m thick in BH04, 0.5m thick in BH05 and 0.8m thick in BH03

In BH03 and BH04, beneath this upper fracture zone, the bedrock was described as 'very hard' granite, occasional fracture/softer bands' which was encountered to 10mbgl.
In BH05, beneath this upper fracture zone, the bedrock was described as 'very hard rock possible ironstone' which was encountered to 10mbgl.

Groundwater
During the fieldworks, water strikes were recorded close to rockhead at 3.5mbgl in BH01 and 3.5mbgl in BH05, located in the west of the site, and within the bedrock at 14.5mbgl in BH02, 8mbgl in BH03 and 8mbgl in BH04, in the central and eastern parts of the site.
The drilling techniques may have masked further water strikes. Groundwater monitoring standpipes were installed in the base of all the boreholes on completion of the drilling works.

Test Results

Conductivity
Conductivity is related to the concentration of ions in the water e.g. dissolved salts and inorganic materials, and therefore conductivity can be used to indicate potential contamination and water quality.

The conductivity Stream Water map indicates that 90% of background conductivity levels are recorded to be above 512 µS/cm around Bangley Quarry. In SEPA's water guidance for Point Source Discharges conductivity levels are given as being between 50 and 1,000 µS/cm for rivers and groundwater The results of conductivity tests on samples from Bangley Quarry were reported as falling between 229-518 µS/cm, indicating good water quality.

Chemical
The soil, leachate, groundwater, and surface water, test results have been summarised, with the full set of test results for each borehole and Surface Water location listed separately included in the baseline report.

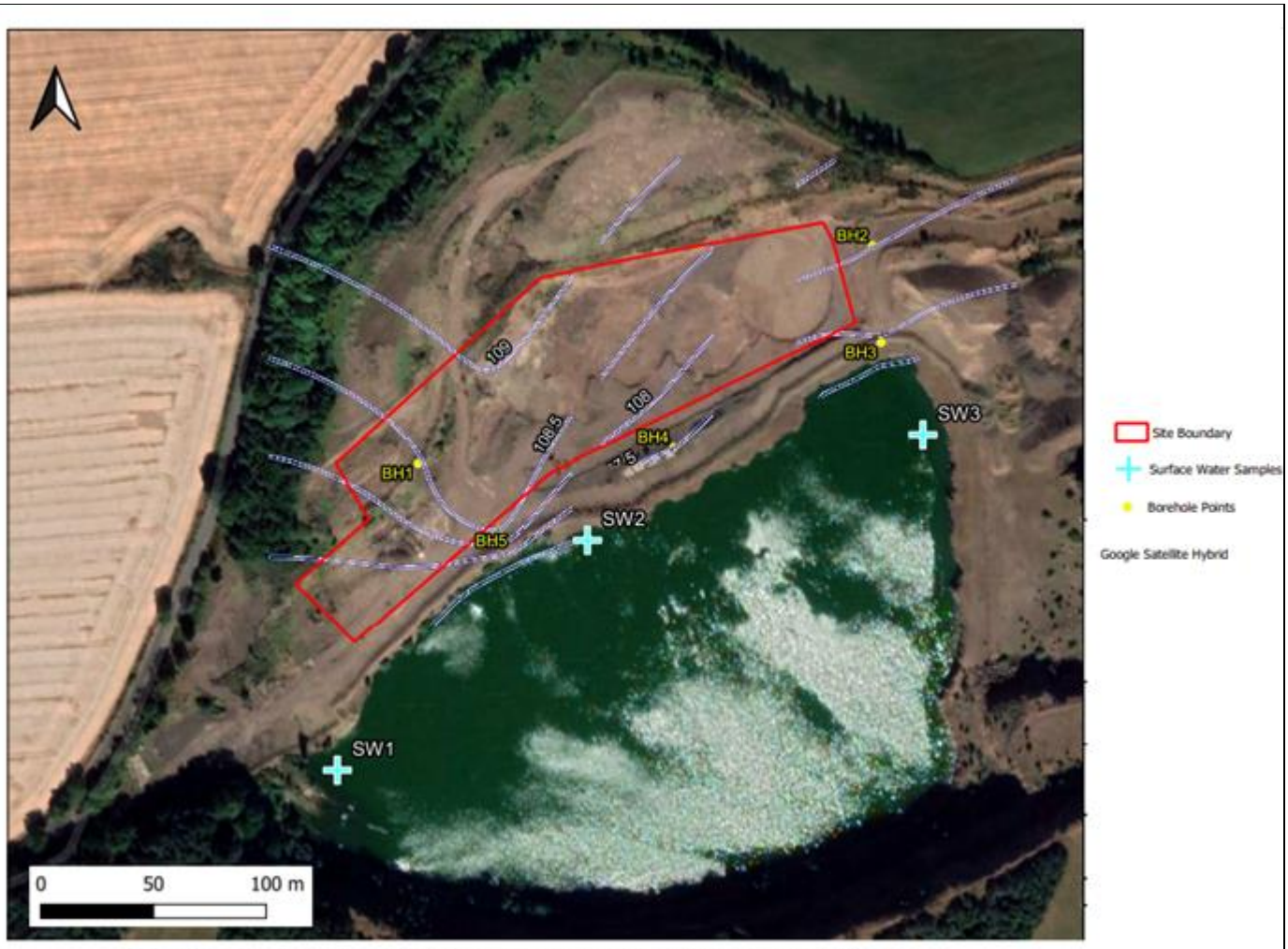
The report identifies 3 Surface water discharge points to the quarry pond described below:

SW1 is located down hydraulic gradient of BH5. The sampling location is down hydraulic gradient of Process Building and storage tanks. There is the potential for contamination arising from storage and transfer of feedstocks and the generation of ammonia within leachate.

SW2 is located down hydraulic gradient of BH4. The sampling location is down hydraulic gradient of storage tanks, separation/extraction station, filling station, and pumproom. There is the potential for contamination arising from transfer of feedstocks, the generation of ammonia within leachate, and treatment with ferric chloride.

SW3 is located down hydraulic gradient of BH3. The sampling location is down hydraulic gradient of storage tanks and attenuation tanks. There is the potential for contamination arising from transfer of feedstocks, the generation of ammonia within leachate, and treatment with ferric chloride. There is also the potential for detergents and solvents to be present in drainage system.

These Surface water discharge points are marked on the aerial photograph below.



from the Original plans in the 1826-201 Baseline report produced by Terrenus Land & Water Limited

Borehole and Surface Water Discharge Point Locations

SEPA Comments

The Site and Baseline report requirement was one of the key areas discussed during the pre-application discussions application. During those discussions, several comments were issued to the applicant regarding what the applicant had proposed for their Site and Baseline monitoring. SEPA contaminated land section in their review of the Baseline and Site reports submitted reported that: having benchmarked the reports against the checklist for requirements in SEPA guidance TG-02, covering Site and Baseline reports, the submitted documents had addressed the comments and potential areas of concern and that the submitted report concluding that:

"All elements have been addressed and the report presents a clear statement of site condition."

And that as the containment infrastructure and associated management systems have been assessed using the two proformas supplied in SEPA Guidance Note TG-42. The assessment concludes that the site has adequate provision in place to prevent, and mitigate, the potential entry of Relevant Hazardous Substances into soil and ground water, and therefore SEPA can justify using the maximum sampling periods specified in the IED, these are:

5 yearly sampling for groundwater and 10 yearly sampling for soils.

Table 1 – Groundwater monitoring requirements

Relevant Hazardous Substance.	Activity to be monitored	Frequency
As per monitoring plan submitted under Condition 4 and agreed in writing by SEPA.	As per monitoring plan submitted under Condition 4 and agreed in writing by SEPA.	
The monitoring plan shall include as a minimum the following substances: COD PFOA PFOS phenol index Total Nitrogen total organic carbon Total Phosphorous Ammoniacal Nitrogen Chloride Total Petroleum Hydrocarbons - CWG with aliphatic and aromatic banding Iron PAH USEPA 16 Speciated pH If the substances specified are not used, produced, stored or released at the site this must be demonstrated in the monitoring plan.	*The plan must consider locations of all activities that use, store, produce or release relevant hazardous substances, including waste streams.*	*The frequency shall be once every 5 years.*

Table 2 – Soil monitoring requirements

Relevant Hazardous Substance.	Activity to be monitored	Frequency
As per monitoring plan submitted under Condition 4 and agreed in writing by SEPA. *The monitoring plan shall include as a minimum the following substances:* COD PFOA PFOS phenol index Total Nitrogen total organic carbon Total Phosphorous Ammoniacal Nitrogen Chloride Total Petroleum Hydrocarbons - CWG with aliphatic and aromatic banding Iron PAH USEPA 16 Speciated pH	As per monitoring plan submitted under Condition 4 and agreed in writing by SEPA. *The plan must consider locations of all activities that use, store, produce or release relevant hazardous substances, including waste streams.*	*The frequency shall be once every 10 years.*

The CO has also been recommended to include the following conditions within the permit:

1. At least every 4 years, the operator shall carry out a systematic assessment of all measures used to prevent emissions from the permitted installation to soil and groundwater. A written report of each

assessment shall be recorded and reported to SEPA. The report shall include details of, and timescales for, any additional measures that are required to prevent emissions to soil and groundwater.

2. The operator shall monitor the groundwater at the site for the relevant hazardous substances specified in Table 1 at the frequency specified in Table 1, the purpose of which shall be to identify groundwater contamination associated with the activities specified in Table 1 by those relevant hazardous substances. Each assessment shall be recorded and reported to SEPA. The first assessment shall be submitted no later than 5 years from the date of this permit. The assessment shall include interpretation of the results with reference to previous monitoring undertaken (including the site and where applicable baseline reports) and operations at the permitted installation and details of corrective actions that are required to protect groundwater and remedy any contamination that has occurred because of permitted activities.

3. The operator shall monitor the soil at the site for the relevant hazardous substances specified in Table 2 at the frequency specified in Table 2, the purpose of which shall be to identify soil contamination associated with the activities specified in Table 2 by those relevant hazardous substances. Each assessment shall be recorded and reported to SEPA. The first assessment shall be submitted no later 10 years from the date of this permit. The assessment shall comply with relevant guidance (specifically including SEPA guidance document IED-TG-42), include interpretation of the results with reference to previous monitoring undertaken (including the site and where applicable baseline reports), and operations at the permitted installation, and details of corrective actions that are required to protect soil and remedy any contamination that has occurred because of permitted activities.

4. The operator shall submit a detailed soil and groundwater monitoring plan, for the monitoring required by Conditions 2 and 3 to SEPA at least three months in advance of carrying out the monitoring. The monitoring plan shall comply with relevant guidance (specifically including SEPA technical guidance document IED-TG-42) and include the locations at which the monitoring shall be carried out and the methodology which shall be used. The monitoring plan shall take account of the systematic assessment required by Condition 1.

5. The operator shall carry out the monitoring required by Conditions 2 and 3 in accordance with the soil and groundwater monitoring plan required by Condition 4

6. The operator shall review the plan required by Conditions 4 no later than 6 months after each monitoring event. The purpose of the review shall be to determine whether any changes to the monitoring locations. Frequency or parameters are required and where changes are proposed, submit a revised plan to SEPA.

9. Notwithstanding the requirements of Conditions X.X, all plans, monitoring, and assessment reports undertaken in accordance with Conditions 1, 2, 3, 4, 5, 6 and 7 shall be preserved until the permit is surrendered.

10. The operator shall maintain the groundwater monitoring wells detailed in the plan required in Condition 4 in a condition fit for purpose, unless otherwise agreed in writing with SEPA. Where a well's function is compromised it shall be repaired or replaced to allow sample collection in accordance with Conditions 2 and 3.

BAT Assessment
Site and Baseline reporting is covered in the following BAT Conclusions
General BATc: 1 4 5 17 18
Biological Treatment None
Anaerobic Digestion None

5.9 Monitoring

Air

Descriptive Monitoring

Environmental Management System

The applicant supplied a full and detailed Environmental Management System which contains a full set of documents looking at all aspects of the site operation, and how the site will be operated and monitored. The EMS identifies those monitoring elements where no numerical standards have been applied. Specific details can be found in the documents comprising the site EMS submitted in support of the application. Below are the key elements of the EMS relating to air emissions.

Monitoring for the following parameters will be carried out:

Odour
Olfactory Monitoring of odour emissions shall be undertaken outside the building down wind of the prevailing wind direction. At least two times daily

Dust
Monitoring for visible aerial dust emissions will be undertaken just outside the building downwind of the prevailing wind direction and in the building during the discharge of waste. At least two times daily and recorded in the site diary.

Fugitive Emissions Procedure
The fugitive emissions procedure documented within the EMS, addresses issues such as testing for leaks and checking seals valves and pipework etc Building integrity and air extraction efficiency will be assessed annually

SEPA Comments
SEPA would require Olfactory Monitoring to be undertaken when the process is in operation and with the results of the monitoring recorded. This should be included within the Odour Management Plan which is part of the overall EMS for the site.

SEPA acknowledges that dust emissions are only a problem during periods of dry weather and that there is little to no benefit monitoring for dust during periods of rain particularly if feedstocks roadways etc are wet and the risk of dust entrainment is low.

Regarding the fugitive emissions procedure. It is assumed that as it relates to fugitive emissions it is undertaken on an “as and when necessary,” basis and would be in addition to general planned maintenance inspections and schedules for the site.

Within the site diary SEPA will require the operator to record the date and time of any visual/Olfactory monitoring together with the wind direction and general weather conditions e.g. light wind, heavy rain, sunny, frosty, etc. as these aid in the investigation should complaints arise. The operator is recommended to consider introducing a daily a monitoring sheet or checklist for staff to record these details on as opposed to the general site diary.

Numerical Monitoring

The following plant and processes have numerical standards applied:

Odour Control
On Site Odour Control System: BAT-associated emission levels (BAT-AELs) 1000 OUE/Nm^3
Off-site Odour (Sensitive receptor): Indicative criterion of significant pollution 1.5 OUE/m^3

Combined Heat and Power Plant

The operator has provided the following information from the manufacturer of the CHP which incorporates modern and efficient design features.

Spot Sampling CHP Stack

Parameter	Emission Limit (mg/m^3)	Frequency
Oxides of Nitrogen as NO_2	250	Annually
Carbon Monoxide	1000	Annually
Oxides of Sulphur as SO_2	300	Annually
VOC	1000	Annually
NMVOC	75	Annually
H_2S	5ppm at outlet and specify concentration which can be combusted at inlet dependent on risk identified via modelling	Annually

Boiler – Indicative

Pollutant	ELV (Normal Temp and Pressure 3% O_2)	Extractive Monitoring Requirements	Continuous Monitoring Requirements
NO_x	100mg/m^3	Minimum annually with option to reduce dependent on risk and consistent compliance	None
CO	10mg/m3	Minimum annually with option to reduce dependent on risk and consistent compliance	Yes, continually monitor Combustion efficiency
SO_2	35mg/m3	Minimum annually with option to reduce dependent on risk and consistent compliance	May be provided (No BAT requirement)
H_2S	5ppm at outlet and specify maximum concentration which can be combusted at inlet dependent on risk identified via modelling	Minimum annually with option to reduce dependent on risk and consistent compliance	Yes, continually monitor Inlet Concentration

Additional Descriptive Monitoring may be required to allow Energy efficiency and balance calculations to be made.

Boiler: operating times and causal events to be to be recorded

SEPA Comments
Combustion on the site is carried out in the Combined Heat and Power Plant CHP rated below 1MW and therefore falls out with the regulatory requirements for Medium Combustion Plant detailed in Schedule 1B of the 2012 Regulations.
In the event of the CHP failing or being offline (e.g. for maintenance) the site will use a backup 1100kW boiler to provide the necessary heat for the site, the actual Net Rated Thermal input for this plant is below 1MW and therefore falls out with the requirements of the Medium Combustion Plant requirements in Schedule 1B of the 2012 Regulations. Based on the SO_2 limit a stack height with no building restriction of under 10m would provide sufficient dispersion the height of the stack with buildings in proximity is below the lower level of the calculator.

As a result, the limits in the tables will be applied to the combustion activities at Bangley Quarry.

Flare
Flare Temperature between 1000°C - 1100°C

SEPA Comments
BAT for flaring Gas in an emergency is that the emissions from the flare stack will be minimised using a correctly designed stack. The design parameters and emissions, and the reported efficiency of the stack installed at Bangley Quarry compares favourably with the benchmark figures given in the Waste Treatment BREF document and as such it is sufficient to include a requirement in the permit that the operator maintain the temperature of the flare between 1000°C - 1100°C.

BAT Assessment
Air Monitoring is covered in the following BAT Conclusions
General BATc: 1 3 8 10 15 18
Biological Treatment BATc 34 Table 6.7
Anaerobic Digestion BATc 38

Water

Excess surface water collecting in bunded areas “bundwater” will be subject to the following monitoring prior to discharge to the surface sewer system and Quarry Pond.

Descriptive Monitoring

Visual inspection: Bund (for staining); Tanks/Containers and Pipework within the bund (for leaks or drips)

Visual and olfactory assessment of the bundwater (for visible grease and oils including oil sheen, staining, discolouration, gassing and odour)

Numerical Monitoring

There is no monitoring on the discharge: what follows is the Benchmarks below which bundwater can be discharged to the Surface water system and the Quarry Pond.

Parameter	Benchmark Threshold for Water Release	Unit

pH	6- 9	pH
COD	<80	mg/l
Suspended Solids	<30	mg/l
Total Phosphorous	<2	mg/l
Ammonia	0.1	mg/l

BOD Monitoring: Operator will be required to submit a bundwater sample for BOD analysis when undertaking Quality Assurance check **and/or** when sampling bundwater after spill, accident or leak into bund

Flow monitoring: Flow Monitoring will be undertaken, with the volume of any discharge recorded

BAT Assessment
Water Monitoring is covered in the following BAT Conclusions
General BATc: 1 3 5 11 19 18
Biological Treatment 35
Anaerobic Digestion None

Soil and Groundwater

Standard Monitoring Frequency

Groundwater 5 yearly Sampling
Soil 10 yearly sampling

Parameters

Table 1 – Groundwater monitoring requirements Standard monitoring frequency

Relevant Hazardous Substance.	**Activity to be monitored**	**Frequency**
As per monitoring plan submitted under Condition 4 and agreed in writing by SEPA.	As per monitoring plan submitted under Condition 4 and agreed in writing by SEPA.	*The frequency shall be once every 5 years.*
The monitoring plan shall include as a minimum the following substances:	*The plan must consider locations of all activities that use, store, produce or release relevant hazardous substances, including waste streams.*	

COD PFOA PFOS phenol index Total Nitrogen total organic carbon Total Phosphorous Ammoniacal Nitrogen Chloride Total Petroleum Hydrocarbons - CWG with aliphatic and aromatic banding Iron PAH USEPA 16 Speciated pH If the substances specified are not used, produced, stored or released at the site this must be demonstrated in the monitoring plan.			

Table 2 – Soil monitoring requirements

Relevant Hazardous Substance.	**Activity to be monitored**	**Frequency**
As per monitoring plan submitted under Condition 4 and agreed in writing by SEPA. *The monitoring plan shall include as a minimum the following substances:* COD PFOA PFOS phenol index Total Nitrogen total organic carbon Total Phosphorous	As per monitoring plan submitted under Condition 4 and agreed in writing by SEPA. *The plan must consider locations of all activities that use, store, produce or release relevant hazardous substances, including waste streams.*	*The frequency shall be once every 10 years.*

Ammoniacal Nitrogen Chloride Total Petroleum Hydrocarbons - CWG with aliphatic and aromatic banding Iron PAH USEPA 16 Speciated pH If the substances specified are not used, produced, stored or released at the site this must be demonstrated in the monitoring plan.			

Bunds and impermeable surfaces or structures will be checked routinely.

BAT Assessment
Soil and Groundwater Monitoring is covered in the following BAT Conclusions
General BATc: 1 4 5 17 18
Biological Treatment None
Anaerobic Digestion None

SEPA Contaminant Land Section has undertaken a review of the Site and Baseline reports and has recommended the standard monitoring frequencies be used to monitor Soil and Groundwater at Bangley Quarry for the Relevant Hazardous Substances listed above This is considered BAT for the purposes of Soil and Groundwater monitoring at the site. Bunds and impermeable surfaces are in the list of plant and equipment to be routinely inspected under the maintenance systems

Waste and By-Products

Load Acceptance

Waste Materials: Types, sources, EWC codes weight /volumes, Waste Transfer Notes.
Feed Material Acceptance: Types, sources, weight /volumes.
Rejected loads: Types, sources, weight /volumes, Waste Transfer Notes Carrier destination.

Waste storage: monitor residence time.

Digester

Continuous Monitoring
Process parameters: temperature, Tank levels, pressure, feed rate, gas pressure, gas production rates and hydrogen sulphide concentrations, Flow.

Critical Equipment Monitoring: pump run times, temperatures, Pressure relief valves, Flow monitoring equipment, tanks and bunds, Abatement Monitoring, and maintenance regimes to prevent saturation of the scrubber and carbon filter system.

Non-Continuous Monitoring
Digester feed: pH, and alkalinity, hydraulic and organic loading rates of the digester feed
Digester Process Parameters: concentration of volatile fatty acids (VFA) and ammonia, liquid and foam levels, grit build-up and de-sludging.

Biogas System

Continuous Monitoring
Biogas quantity and composition: volume, flow rate, methane, CO_2, H_2S, ammonia and moisture.

Biogas Use
Consumption by CHP and Boiler: pressure, flow rate, volume, total power, and heat output.
Biogas upgrading Pressure in the biogas system flow rate, volume CO_2, H_2S Ammonia.
Propane adjustment: where required pressure, flow rate, volume, concentration.
Flaring: see flare operation.

CO2 Recovery System *[when fitted]:* Volume, efficiency, recovery rate, storage levels, gas purity.

PAS 110 Product monitoring
Daily: Organic Loading Rate.
Weekly: Ammonia Volatile Fatty Acids (VFA), Alkalinity and pH.
Monthly: Carbon: Nitrogen (C:N) ratio.

Product: Storage capacity, Quantity Produced, Quantity supplied, tonnage capacity destination
Off-Spec Product: Liquid/solid, Quantity, composition, Waste Transfer Notes, Method of Recovery/ Disposal site details inc license or Exemption details .

Other Waste: The types, quantities EWC codes and fate of other process related waste shall be monitored and recorded.

Other on-Site Monitoring

Noise and Vibration: Controlled through the Noise and Vibration Management

Vermin
Building and drains: inspected weekly for vermin issues results recorded in the site diary, vermin control methods to be employed, vermin control specialists to be employed if problem persist.
General areas: staff should report if they see, or suspect, vermin are present.

General Housekeeping
Litter: receptacles and storage bays checked twice for daily litter and debris collected and disposed of.
Cleaning: The floor of the building shall be brushed at least once per day and more often, if necessary.
Reception areas bunds etc: shall be monitored and cleaned if or when necessary.

Lighting: Lighting to be monitored to ensure adequate light for carrying out of Permitted operations including load inspection, operational checks, monitoring, and inspection, outwith the process buildings

check on bulb or LED replacement stocks and lighting efficiency, ensure that any potential light pollution from the site is minimised.

Site Security and Signage
Site Security: Perimeter fences gates etc. to be routinely monitored for damage and repaired, as necessary. All gates, doors, to be locked, and any alarms set at end of working day, procedures in place to monitor and respond to unauthorised access. Details of any unauthorised or unscheduled vehicles arriving at the site shall be recorded and where necessary reported. Instances of fly tipping will be monitored and reported.
Site Signage: All instructional signs shall be monitored to ensure correct instructions are conveyed to drivers and visitors and are clear and legible with adherence and compliance instruction monitored. Tanks delivery/uplift and discharge points should be clearly signed.
The Site licence information and incident reporting instructions must be kept up to date.

BAT Assessment
Waste and by-Products monitoring section is covered in the following BAT Conclusions
General BATc: 1 2 4 8 11 13 17 18 21 22 23 24
Biological Treatment BATc 33
Anaerobic Digestion BATc 38

The BAT Reference Document provides details regarding those issues listed under “Other On-site Monitoring” These are discussed as general BAT for the Waste Treatment Sector and cover some issues which are not addressed within the BAT Conclusions e.g. housekeeping, security, and signage.

SEPA Recommendations
Lightning Protection Systems (not a BAT requirement) where fitted should be professionally installed, suitable to protect the site, and maintained in a good state of repair.
Electrical Surge Protection (not a BAT requirement) where fitted should be maintained in good working order to protect key process critical control equipment.

5.10 Consideration of BAT and compliance with BAT-Cs if appropriate

The following guidance documents have been used when considering the BAT proposals put forward.
The ‘BREF BAT Conclusions for Waste Treatment (10/08/2018)’
Best Available Techniques (BAT) Reference Document for Waste Treatment 2018
‘SEPA Noise: Summary Guidance for PPC Applicants (June 2015)’
‘SEPA Odour Guidance (January 2010)’
Several informal requests for clarification were made in respect of the odour monitoring report and the Odour stack height required a BAT clarification as did the reasoning behind the choice of abatement system.

Overall, the application was detailed and required little in the way of further information or input from the applicant.

The report above summarises the information submitted in support of the Application for a PPC Part A Permit to operate an AD Plant at Bangley Quarry. This information is presented along with a summary of the BAT conclusions applicable to the Activity or Directly Associated Activity (DAA) discussed.

Having reviewed the proposals submitted with the application and compared what is proposed with the relevant WT BAT Conclusions; SEPA, considers that the documentation provided with the application, when combined with the responses to the additional questions and queries raised, shows that the mode and method of operation proposed in the Bangley Quarry application, meets the BAT requirements applicable to an AD Biological Waste treatment Plant.

5.11 Biogas Treatment

Pentair biomethane upgrading plant

A significant proportion of the Biogas produced at Bangley Quarry is to be injected into the gas grid as biomethane. This needs to be cooled and stripped of CO_2 and any other contaminants. The applicant has outlined that to enable this they have installed a commercial system manufactured by Pentair, which comprises a biogas upgrading system combined with CO_2 recovery and liquefaction system and is reported in open-source reports as using one of the most energy efficient and sustainable methods available. Information provided by the operator stated as part of the BAT justification that the "*Pentair CO2 recover integrated plants have the lowest methane slips of all available technology."* adding *"There is also very little water requirement and no requirement of additional chemicals."*
The Injection of biomethane to grid should be considered BAT as it is much more energy efficient as opposed to burning biogas for electricity. The production of biomethane into the National gas grid combined with CO_2 recovery system capable of producing CO_2 of a quality which can be used in food and drink and other industrial uses is considered BAT.

A detailed description of the Pentair plant and the gas upgrade process are provided in the application with a summary of the key elements of the system being described below.

Pre-treatment
Before the biogas can be upgraded to biomethane, the gas must be cleaned to remove impurities. The gas cleaning process consists of the following steps:

Gas cleaning
The technical details provided in the application advise that gas purification is adapted to the actual demand in each biogas plant. Such that depending on the feed composition and gas utilization, different cleaning processes may be necessary.

Desulphurisation;
Hydrogen sulphide must be removed from the biogas as it can cause significant damage to conveyance infrastructure, pumps, valves, meters, etc. As a result it requires to be removed both prior to injection of Biomethane into the natural gas mains, and the use of biogas by the internal systems equipment (e.g. the boiler and gas engine).

Biogas will be analysed with the results recorded and monitored to identify any increase in hydrogen sulphide (H_2S) levels. Action trigger limits have been set and if H_2S increases to pre-determined levels measures will be taken to reduce H_2S levels. The applicant has advised that sampling and monitoring locations may include (but are not limited to) the digesters, before the carbon filters, and before the biogas upgrading unit. The report and technical details describe the desulphurisation methods in more detail outlining there are several methods which can be used to remove H_2S from the biogas/biomethane and that the chosen methods depends on the level of H_2S in the gas produced during the AD process the three most common are as follows:

Biological coarse desulphurisation.
Biologically reduction of the H_2S concentration in the biogas by oxygenating it to Sulphur, induced by feeding oxygen (after which further desulphurisation can be achieved using an activated carbon filtration system).

Chemical Desulphurisation
Installed to support the biological desulphurisation occurring within the AD process this is achieved through the addition of Iron II or Iron III or ferric salts (commonly Chlorides of Iron) which is dosed into the fermenters.

Desulphurisation Using Activated Carbon
After gas cooling and compression, one or more activated carbon filters are installed, depending on the gas flow. The activated carbon filter is designed for the corresponding gas flow and is used for fine desulphurisation of the gas.

Removal of VOC
The formation of VOCs within the digestion process depends primarily on the composition of the feed materials fed being digested. Whilst these can be reduced by controlling the feedstock they cannot be eliminated. The VOCs remaining in the biogas are required to be removed prior to introducing the subsequent biomethane into the natural gas main. This is achieved by compressing and cooling the biogas and passing it through an activated Carbon filter specifically produced to remove VOCs.

Removal of Ammonia
As with the VOCs, the removal of ammonia is particularly necessary when introducing biomethane into the natural gas mains. As ammonia is highly soluble in water, in several cases it may be sufficient to remove the ammonia by washing. However, in many cases it may be necessary to does sulphuric acid into the ammonia washing system, this is controlled through pH measurement to give a "scrubber" solution with a pH of 2.

Monitoring and maintenance
Monitoring is in place to identify when the scrubber and carbon filter system are reaching saturation point.

The plant operator will routinely sample and monitor the biogas treatment system gas stream as part of the site's operating procedures. The sampling points are to be determined during plant commissioning and will not only allow for tracking and analysis of the biogas through gas treatment process but are also indicative of the performance of the gas treatment system. The gas analytical results will be recorded and monitored increase in hydrogen sulphide (H_2S) levels with action trigger limits set if H_2S increases to pre-determined levels.

SEPA Discussion
The literature on biogas upgrading to biomethane outlines there are two principal methods for separating CO_2 and Methane in the biogas: Pressureless Amine scrubbing and Membrane technology.
As both technologies achieve the aim of producing a high purity methane with minimal methane loss/ escape the choice of process used comes down to plant performance, operator preference, and any market requirements that must be met.

Pressureless Amine Scrubbing Technology
This is a chemical scrubbing device using an amine scrubbing solution in a "packed" column to remove CO_2. High purity biomethane is drawn off at the top of the column. The used amine scrubbing solution is drained off at the bottom of the column and can be regenerated by heating with the CO_2 being vented to atmosphere. The pressureless amine scrubbing technique is deemed suitable for sites where there is a source of heat, where the biomethane must meet very high standards, and where it needs to be at low pressure for transfer to the injection station.

Membrane Technology
As described membrane technology requires additional pre-treatment before being fed into the membrane filter. The separation of the CO_2 from Methane takes place in the membrane filter by selective permeation: The methane is retained in the membranes and drawn off from the modules as a product gas at the end of the process, whilst the CO_2 is commonly vented to atmosphere.
Membrane Technology is suitable for installations with low, stable, and predictable electricity costs, where the volumes of raw biogas are small and subject to fluctuation, and where the biomethane gas must be transferred at high pressure.

The Injection of biomethane to grid is "cleaner" and much more energy efficient than burning biogas for electricity. When combined with a CO_2 recovery system capable of producing CO_2 of a quality which can be used in food and drink, and other industrial uses, must be considered BAT. The applicant has outlined that for this purpose they have installed a commercial system manufactured by Pentair, this system is described as having good energy efficiency, low water and chemical usage, and low methane slip. It utilises an industry standard, purpose-built Membrane technology system with the ability for CO_2 capture,

recovery, and liquefaction, which is described as “one of the most energy efficient and sustainable methods available.” SEPA considers the inclusion of this type of plant to meet the current BAT requirements.

SEPA will expect the biogas upgrade plant, and the CO_2 recovery system (once operational) to be maintained in line with equipment supplier recommendations and included in the site’s preventative maintenance regime.

BAT Assessment

There are no BAT Conclusions referring to Biogas Treatment in Waste Treatment Activities

The Waste Treatment BAT Reference Document (WT BREF) discusses Biogas Treatment advising that Biogas Treatment consists of three stages: The Biogas is dehumidified, cleaned to remove hydrogen Sulphide (H_2S) (after which it is suitable for use as a fuel) and a third stage where it is upgraded to Biomethane by removal of Carbon dioxide. The techniques employed to carry out each of the stages is summarised below.

Water removal: cooling/condensation, or by using either a drying agent or glycol / hygroscopic salts.

H_2S removal: precipitation by addition of Iron salts ($FeCl_2$, $FeCl_3$, or $FeSO_4$) forming iron sulphide and/or by the controlled addition of oxygen; chemical adsorption using sodium hydroxide, iron oxide or activated carbon adsorption biogas scrubbing; or outwith the digester, biological or chemical desulphurisation.

CO_2 removal: pressure swing adsorption (PSA), (adsorption by activated carbon or zeolite under elevated pressure) scrubbing; using water, organic solvent (e.g. polyethylene glycol) or chemical scrubbing (e.g. amine solutions) membrane separation; cryogenic condensation.

The WT BREF provides an indicative overview of the requirements for biogas treatment in relation to the intended use.

According to the BREF table Bangley Quarry require to employ all three treatment measures prior to injection into the Gas Grid (H_2S control , CO_2 Removal and H_2O removal)

BAT Monitoring
Under Biogas Treatment the Waste Treatment BREF reports that the parameters commonly monitored for in emissions from biological steps of the process are NH3, NMVOC, and odour, adding that emissions from biogas combustion (SO_X, NO_X, CO) are not within the scope of the WT BREF.

5 Other Legislation Considered	
Nature Conservation (Scotland) Act 2004 & Conservation (Natural Habitats &c.) Regulations 1994	
Is there any possibility that the proposal will have any impact on site designated under the above legislation?	**No**
No designated sites within the screening distance for the activities and DAA’s applied for	
Screening distance(s) used	2km and the MCP Screening tool (automatic screening distance)

Is there any other legislation that was considered during determination of the permit (for example installations that may be impacted by the requirements of legislation involving Animal By Products, Food Standards, Waste, WEEE regulations etc). If yes, provide information on the legislation, action and justification below:	**Yes**

COMAH

SEPA COMAH Specialists were consulted during the pre-application stage for this application and again through the planning consultation which followed the application by Bangley Quarry biogas for A Hazardous Substances Consent. On both occasions the advice of SEPA COMAH officers has been that the amounts of Hazardous substances stored / used on the site make the Bangley Quarry Biogas Plant a Lower Tier COMAH establishment

Specialists advised that no additional measures need be included within the PPC Part A permit, however the site would require a Hazardous Substances Consent from the Local Planning Authority and both a Safety Management System and a Major Accident Prevention Policy (MAPP).

In October 2023, the applicant applied to East Lothian Council for a Hazardous Substances Consent (HSC) covering the storage and use of Biogas (denoted P2 Flammable gas) and Propane (Liquified Flammable Gas) and for the Storage (Only) of Biomethane (Liquified Flammable Gas) at the site.

It could be opined that the HSC is a requirement of the planning permission all Specified Waste Management Activities sites require under the Fit & Proper check and that to operate to the Safety Management System and a Major Accident Prevention Policy (MAPP) could be deemed a BAT requirement and that these should be added to the Site EMS.

Planning Permission Constraints

This PPC site is situated in a quarry which is a designated SSSI for geological features which have the potential to be impacted by construction of buildings, bunds, and subsurface structures, as a result Nature Scotland were given the opportunity to comment on the application through the consultation procedure. It was also noted that the planning permission included conditions requiring the site to be cleared of all infrastructure should operations cease and return the quarry to a “natural” state as an amenity area (it is unclear if this was linked to the Geological features of the site)

Furthermore, the planning permission was subject to appeal. That appeal allowed the prospective site operators to carry out waste activities on the site but placed conditions on how certain activities were to be undertaken. As a result, the planning conditions place Legal and Technical restrictions which SEPA is required to take account of when permitting the site.

Highway safety was an issue during the planning process with the council concerned that the number of vehicles transporting 100,000 Tonnes of material to the site would generate a risk to road safety. The reporter overseeing the planning appeal disagreed with the safety objection raised by the council. All delivery vehicles, including HGV traffic, and tractor trailers, must access and egress the site only by way of the C112 classified road and the A199 to the southwest of Bangley Quarry. It is a condition of the planning that no delivery vehicles, including HGV traffic and tractor trailers, should enter or leave the site via the C112 public road to the northeast of Bangley Quarry, due to its narrowness and the lack of appropriately sized passing places.

Officer	MH

6 Environmental Impact Assessment and COMAH

Guidance Notes:

The PPC Regulations require that under certain circumstances SEPA take into consideration the information in any statutory Environmental Impact Assessment carried out as part of the planning process or a Safety Report produced under the Control of Major Accident Hazards Regulations.

How has any relevant information obtained or conclusion arrived at pursuant to Articles 5, 6 and 7 of Council Directive 85/337/EEC on the assessment of the effects certain public and private projects on the environment been taken into account?	
Not Applicable	
How has any information contained within a safety report within the meaning of Regulation 7 (safety report) of the Control of Major Accident Hazards Regulations 1999 been taken into account?	
No, Lower Tier COMAH Site	
Officer:	MH

7 Details of the permit

Guidance Notes:
All non-standard conditions should be discussed with an appropriate specialist and legal to ensure they are appropriate and enforceable.

All non-standard conditions and, in the case of a permit variation, changes to existing text, tables or diagrams should be outlined and justified below. Where a group of related conditions are included, these can be included in one section and a single justification provided. Justifications can be linked to sections above, and/or the draft permit/variation schedule.

Do you propose placing any non-standard conditions in the Permit?	**Yes**
Do you propose making changes to existing text, tables or diagrams within the permit?	**No**

Outline the changes required and provide justification below:

Proposed Condition Number:	**Proposed Change:**	**Justification:**
3.9.3	All surface water collected from within bunded areas “bund water” shall be sampled and tested in accordance with condition 3.9.5.	To include conditions to describe the measures inspections and testing the operator must undertake prior to the discharge of bundwater [what the waste treatment BREF describes as “rainwater”] to a Surface Water system
3.9.3.1	If the results of the sampling and testing required under Condition 3.9.4 show the bund water is below the event mean concentration (EMC) value or is within the range, as appropriate, for the parameters specified in Table 3.3 it shall be deemed “uncontaminated” then the operator may discharge it to the surface water sewer system to the Emission Point identified on the Borehole and Surface water discharges plan in Appendix 1.	Setting the conditions under which the discharge of “clean” bundwater is permitted to be discharged to the Surface Water system
3.9.3.2	Bund water which exceeds the (EMC) or is outwith the range for the parameters in Table 3.3 shall be deemed to be “contaminated” and must be either treated in the digestor or transported to a suitably licensed facility for disposal	Describing the measures to be taken should the bundwater exceed the limits set in the relevant tables

Officer:	MH

8 Emission Limit Values or Equivalent Technical Parameters/Measures	
Are you are dealing with either a permit application, or a permit variation which would involve a review of existing ELVs or equivalent technical parameters?	**No**
Officer:	MH

9 Peer Review	
Has the determination and draft permit been Peer Reviewed?	**Yes**
Comments made:	
No additional information or changes required.	
Officer:	Specialist 2 PPC Permitting Officer

10 Final Determination

Issue of a Permit - Based on the information available at the time

Issue a Permit – Based on the information available at the time of the determination SEPA is satisfied that

- The applicant will be the person who will have control over the operation of the installation/mobile plant,
- The applicant will ensure that the installation/mobile plant is operated to comply with the conditions of the Permit,
- The applicant is a fit and proper person (specified waste management activities only),
- Planning permission for the activity is in force (specified waste management activities only),
- That the operator can use all appropriate preventative measures against pollution, through the application of best available techniques.
- That no significant pollution should be caused.