Permitting decisions

Bespoke permit

We have decided to grant the permit for Spaldington Anaerobic Digestion Facility operated by R100 Energy Limited.

The permit number is EPR/GP3439QK.

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

Purpose of this document

This decision document provides a record of the decision making process. It summarises the decision making process in the decision checklist to show how all relevant factors have been taken in to account.

This decision document provides a record of the decision making process. It:

- highlights key issues in the determination
- summarises the decision making process in the decision checklist to show how all relevant factors have been taken into account

Unless the decision document specifies otherwise we have accepted the applicant's proposals.

Read the permitting decisions in conjunction with the environmental permit. The introductory note summarises what the permit covers.

Key issues of the decision

Emissions to Air

The anaerobic digestion (AD) facility will consist of a Gas Utilisation plant compound (GUP) comprising of gas cleaning plant, a biogas upgrading system, two acoustically clad CHP engines rated at ~2.9MWth each (5.8MWth aggregated), two emergency back-up boilers and flare stack, reception building and site office, two primary digesters, post digester (digestate) storage tank and rainwater harvesting tank

The operation of the GUP facility principally gives rise to the potential impact on the local air quality of emissions from the combustion of biogas fuel, releases to air of from the biomethane upgrading plant, back-up gas boilers and emergency flare system. The emissions of potential concern are those of nitrogen dioxide, sulphur dioxide, carbon monoxide and Volatile Organic Compounds (VOCs).

The site will have two 0.8Mwth back up boilers to provide heat to the pasteurisation process should the CHP engines be non-operational, the boilers are expected to be required <10 days per year. Due to their size they will not be subject to the Medium Combustion Plant Directive (MCPD) and no emission limits have been.

In respect of emissions from the GUP, process contributions can be considered insignificant if:

- the long term process contribution is <1% of the long term environmental standard;

  and

- the short term process contribution is <10% of the short term environmental standard

The applicant has assessed the contributions of the installations point source emissions of NOx and SO_2 from the CHP engines and backup boilers on nearby human receptors and habitats sites using Aermod (Advanced atmospheric dispersion model). In terms of predicted impacts from the GUP, the applicant has carried out detailed air dispersion modelling of short and long term impacts based on both CHP engines operating at worst case scenario benchmark ELV's laid down in 'Table 2' of The MCPD, however for NO_X the applicant has chosen to use a lower ELV that that prescribed in the MCPD at 250mg/Nm3 rather than 500mg/Nm3 (based on normal operating conditions and load - temperature 0°C (273K); pressure: 101.3 kPa and oxygen: 5 per cent (dry gas) or approximately 95 mg/Nm3 (at 273K, dry, 15% oxygen).

The CHPs and Gas upgrading plant will be used in preference to the flare in order to maximise gas utilisation, the flare along with the two small package boilers are considered to be a direct associated activity's and will provide a standby role only being used when the engines/gas upgrading plant are non-operational and in the case of the package boilers to ensure a supply of heat to the pasteurisation process via heat exchanges during power failure this is expected to be <10% of the time.

NO_2

The maximum long term predicted annual mean nitrogen dioxide Process Contribution (PC) at a relevant receptor (ESR 2) is ~0.59µg/m^3 this represents 1.48% of the relevant AQS objective of 40µg/m^3 and is above the insignificance screening criterion of 1%. The PEC at this location however is calculated to be 8.8µg/m^3 this represents a total of 22.2% of the AQS of 40µg/m^3.

The maximum short term predicted nitrogen dioxide Process Contribution (PC) at a relevant receptor (ESR 9) is 24.00 ug/m^3 this represents 12.00% of the relevant AQS objective of 200µg/m^3 and is above the insignificance screening criterion of 10%. The PEC at this location however is calculated to be 40.70ug/m3 this represents a total of 20.35% of the AQS of 200µg/m3

Impacts of LT and ST NO_2 cannot therefore be screened out as insignificant as PC are calculated to be >1% and >10% of relevant ES respectively, however have been assessed as being unlikely to give rise to significant pollution in that the predicted environmental concentration is less than 100% (taking expected modelling uncertainties into account) of both the long term and short term ES.

We have carefully scrutinised the Applicant's proposals to ensure that they are applying the Best Available Techniques to prevent and minimise emissions of these substances.

SO_2

The maximum 15 minute mean (99.9th %ile), 1-hour SO2 (98.8th %ile), 24-hour (99.18%ile) Sulphur Dioxide Process Contributions at modelled receptor (ESR 9) are calculated to be 27.53µg/m3, 11.07µg/m3 and 2.48µg/m3 respectively this represents 10.35%, 6.30% and 1.9% of relevant AQS of 266µg/m3, 350µg/m3 and 125µg/m3.

The PC is therefore calculated to be <10% of the relevant AQO for both 1-hour SO2 (98.8th %ile), 24-hour (99.18%ile) and can be considered insignificant however the maximum 15 minute mean (99.9th %ile) of 27.53µg/m3 is slightly >10% of the relevant AQO of 266ug/m3 and therefore cannot be considered insignificant, however emissions have been assessed as being unlikely to give rise to significant pollution in that the predicted environmental concentration is less than 100% (taking expected modelling uncertainties into account) of the short term ES.

We have carefully scrutinised the Applicant's proposals to ensure that they are applying the Best Available Techniques to prevent and minimise emissions of these substances.

The operator has confirmed that activities will be managed and operated in accordance with a management system including the inspection and maintenance of equipment/engine management systems. The activities are not being carried out within an AQMA designated for NOx.

The Environment Agency agrees with the operators conclusions that the CHP plant emissions are unlikely to lead to a breach of any AQS outside of the permitted boundary.

Gas Upgrading Plant

The applicant has submitted a full risk assessment in accordance with our H1 for emissions to air (H1 Tool) for the gas upgrading plant and has conducted a full BAT candidate options appraisal. All emissions screen out as insignificant. We agree that dry membrane separation technique represents site specific BAT for the facility.

Decision checklist

Aspect considered	Decision
Receipt of application	
Confidential information	A claim for commercial or industrial confidentiality has not been made.
Identifying confidential information	We have not identified information provided as part of the application that we consider to be confidential The decision was taken in accordance with our guidance on confidentiality.
Consultation	
Consultation	The consultation requirements were identified in accordance with the Environmental Permitting Regulations and our public participation statement. The application was publicised on the GOV.UK website. We consulted the following organisations: • Food Standards Agency • Local Planning Authority • Environmental Health • Public Health England

Aspect considered	Decision
	• Department of Public Health • Health and Safety Executive
Operator	
Control of the facility	We are satisfied that the applicant (now the operator) is the person who will have control over the operation of the facility after the grant of the permit. The decision was taken in accordance with our guidance on legal operator for environmental permits.
The facility	
The regulated facility	We considered the extent and nature of the facility at the site in accordance with RGN2 'Understanding the meaning of regulated facility', Appendix 2 of RGN 2 'Defining the scope of the installation', Appendix 1 of RGN 2 'Interpretation of Schedule 1', guidance on waste recovery plans and permits. The extent of the facility defined in the site plan and in the permit. The activities are defined in table S1.1 of the permit.
The site	
Extent of the site of the facility	The operator has provided a plan which we consider is satisfactory, showing the extent of the site of the facility The plan is included in the permit.
Site condition report	The operator has provided a description of the condition of the site, which we consider is satisfactory. The decision was taken in accordance with our guidance on site condition reports and baseline reporting under the Industrial Emissions Directive.
Biodiversity, heritage, landscape and nature conservation	The bespoke application is within the relevant distance criteria of a site of heritage, landscape or nature conservation, and/or protected species or habitat. **Special Areas of Conservation** – • Skipwith Common 8826m (SAC) • River Derwent (SAC) 4042m Radial • Lower Derwent Valley 3431m Radial (SAC) • Humber Estuary 6104m Radial (SAC) **Special Protection Areas –** • Lower Derwent Valley (SPA) 3431m • Humber Estuary (SPA) 6104m Ramsar Sites – • Lower Derwent Valley 6239m • Lower Derwent Valley 3431m (Ramsar)

Aspect considered	Decision
	• Humber Estuary (Ramsar) 6104m Radial **Local Wildlife Sites** • Rushwood: Feather Bed Lane,Common and Drain, Bishopsal Drain • North Howden Fish Ponds 1845m Radial • Wressle Verge 1763m Radial • Tottering Lane, Gribthorpe "This PPC installation is not considered 'relevant' for assessment under the Agency's procedures which cover the Conservation (Natural Habitats &c.) Regulations 1994 (Habitats Regulations). This was determined by referring to the Agency's guidance 'AQTAG014: Guidance on identifying 'relevance' for assessment under the Habitats Regulations for installations with combustion processes.' There are no other emissions from the installation, thus no detailed assessment of the effect of the releases from the installation on SACs, SPAs and Ramsar sites is required." We consider that the application will not affect any sites of nature conservation, landscape and heritage, and/or protected species or habitats identified. We have not consulted Natural England delete as appropriate on the application. The decision was taken in accordance with our guidance.
Environmental risk assessment	
Environmental risk	We have reviewed the operator's assessment of the environmental risk from the facility. The operator's risk assessment is satisfactory. • There are no point source emissions to water from the AD facility. • The operator has carried out an impact assessment of emissions to air for human and ecological receptors using AERMOD Version 9.6.5 (Please see key issues section of this document) • The facility will be constructed with impermeable surfacing and a sealed drainage system. All storage and treatment vessels for liquids and slurries will be bunded. Bunds will have a capacity of 110% of largest tank or 25% of the total capacity of all the tanks within the bund, whichever is the larger. • The operator has provided a suitable risk assessment in relation to potential odour generation from the facility and has a suitable odour management plan, monitoring procedure and complaints procedure in place The Qualitative Noise Screening Assessment Tool was run using the application parameters, and the screening outcome was that a Noise Impact Assessment (NIA) or Noise Management Plan (NMP) would not be required. Whilst not required, the application contained a NIA which identified local noise-sensitive receptors, potential sources of noise at the proposed plant

Aspect considered	Decision
	and noise attenuation measures where necessary. The assessment concluded that the noise from the proposed plant is predicted to be below background noise levels during both daytime and night-time periods and, therefore, will have a no to 'low' impact. Based upon the information in the application we are satisfied that the appropriate measures will be in place to prevent or where that is not practicable to minimise noise and vibration and to prevent pollution from noise and vibration outside the site. The location of the facility is within a predominantly rural environmental setting with the nearest residential receptors being approximately 1,150m to the West and at 702m to the North West from the site. And is located immediately adjacent to a waste treatment facility, and wood treatment facility (<50m). The site will be under the control of a Technically Competent Manager who holds appropriate qualifications for operation of the installation.
Operating techniques	
General operating techniques	We have reviewed the techniques used by the operator and compared these with the relevant guidance notes and we consider them to represent appropriate techniques for the facility. The applicant has provided a full and comprehensive review of operating techniques in accordance with the latest Waste Treatment BAT reference document for waste treatment and associated BAT conclusions document (08.2018) under Directive 2010/75/EU. The operating techniques that the applicant must use are specified in table S1.2 in the environmental permit.
Odour management	We have reviewed the odour management plan in accordance with our guidance on odour management. The original OMP supplied as part of the permit application contained insufficient information relating to inventory of potential odorous solids/liquids, localised receptors, appropriate measures, pre-acceptance procedures and bio-gas cleaning-up processes. The Agency issued a Schedule 5 notice on the 5th December 2018 requiring the applicant to submit an updated OMP for review. Waste reception, storage, hydrolysis, pasteurisation and digestion phases are carried out as a sealed process with limited possibility for odour pollution to arise outside of the permitted boundary. The site is located in a rural setting with the nearest residential being over 700m away from the facility. We consider that the revised odour management plan is satisfactory.

Aspect considered	Decision
Permit conditions	
Use of conditions other than those from the template	Based on the information in the application, we consider that we do not need to impose conditions other than those in our permit template.
Waste types	We have specified the permitted waste types, descriptions and quantities, which can be accepted at the regulated facility. We are satisfied that the operator can accept these wastes for the following reasons: • they are suitable for the proposed activities • the proposed infrastructure is appropriate • the environmental risk assessment is acceptable. We made these decisions with respect to waste types in accordance with the List of Wastes (England) regulations 2005, European Waste Catalogue (EWC) 200/532/EC (Amended), TGN IPPC S5.06 and Technical Guidance Note – Framework for assessing suitability of wastes going to anaerobic digestion, composting and biological treatment.
Pre-operational conditions	Based on the information in the application, we consider that we need to impose pre-operational conditions. **Pre Operational Measure PO1** requires the operator to review of the design, method of construction and integrity of the proposed site secondary containment is carried out by a qualified structural engineer. This is to ensure that the as-built secondary containment meets the standards set out in the technical guidance documents and implement the maintenance and inspection regime and provides appropriate environmental protection. **Pre Operational Measure PO2**: Requires the operator to submit a full written copy of the site Environmental Management System (EMS) prior to commissioning of the installation and make available for inspection all documents and procedures which form part of the site EMS. This is a set of procedures that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints using sufficient competent persons and resources. Permit condition 1.1.1 sets out the requirement for the implementation of a full written EMS prior to operating to comply with permit conditions. **Pre Operational Measure PO3**: Requires the operator to provide a written commissioning plan (including timescales for completion) for approval by the Environment Agency, this is to ensure that all relevant measures are being taken to protect the environment during the commissioning phase.

Aspect considered	Decision
	Pre Operational Measure PO4: requires the operator to provide written evidence to demonstrate that the manager of the installation is competent and holds the relevant qualifications under the CIWM/WAMITAB scheme or other equivalent for the operation of the anaerobic digestion plant and operation of the biogas upgrading plant (including the injection of biomethane into the Gas Grid) prior to operation. **Pre Operational Measure PO5:** Requires the operator at least 2 week before commencement of operations to submit a revised odour management plan to the Environment Agency for written approval. This is required to ensure that the OMP is robust prior to commencement of activities in order to prevent odour pollution outside of the site.
Improvement programme	Based on the information on the application, we consider that we need to impose an improvement programme. Improvement programmes reference **IC1 and IC2** are included within Table S1.3 of the EPR permit and are referred to in condition 2.4 of the permit relating to emissions to air from the gas upgrading plant. We have imposed improvement conditions to ensure that assumptions made in the application relating to the releases of pollutants to air are verified, appropriate measures are in place to prevent pollution and demonstration of compliance with emission limit values. We consider this to be proportionate to the risk posed by the operation of the facility.
Emission limits	We have decided that emission limits should be set for the parameters listed in the permit. <u>Emissions to Air</u> The following substances have been identified as pollutants of concern from the two CHP engine stacks (Emission Point A1 and A2) As they are new gas engines >1MWth they will be subject to the emission limits for new Medium Combustion Plant (MCPD) fuelled on biogas. The operator has undertaken NOx impact assessment from the CHP engine emissions based on an ELV of 250mg/Nm3 approximately 95 mg/Nm3 (at 273K, dry, 15% oxygen) rather than an upper limit of 500mg/Nm3 allowed under the MCPD (normal operating conditions and load - temperature 0°C (273K); pressure: 101.3 kPa and oxygen: 5 per cent (dry gas) we have therefore restricted the biogas engines to this limit within table S3.1 of the permit. Emission Limit Values in Table S3.1 have been set based on normal operating conditions and load - temperature 0°C (273K); pressure: 101.3 kPa and oxygen: 5 per cent (dry gas). The measurement uncertainty specified in section 4.5.1 of LFTGN08 v2 2010 shall apply.

<table>
<tr><th>Aspect considered</th><th>Decision</th></tr>
<tr><td></td><td>
<table>
<tr><th>Emission</th><th>Emission Limit Value</th></tr>
<tr><td>Oxides of Nitrogen</td><td>250 mg/m^3</td></tr>
<tr><td>Carbon Monoxide</td><td>40 mg/m^3</td></tr>
<tr><td>Total VOCs</td><td>1000 mg/m^3</td></tr>
<tr><td>Sulphur Dioxide</td><td>107 mg/m3</td></tr>
</table>
The following substances have been identified as being pollutants of concern from the emergency flare (Emission point A3) and ELVs based on BAT have been set for those substances, these being taken from Table “A” of LFGTN 05. Monitoring is however required only where the flare is operational greater than 10% of the time (on an annual basis). The flare will be providing a standby role only, being used when the gas upgrading plant is non-operational e.g. routine servicing, breakdown or commissioning.
<table>
<tr><th>Emission</th><th>Emission Limit Value:</th></tr>
<tr><td>Oxides of Nitrogen</td><td>150 mg/m3</td></tr>
<tr><td>Carbon Monoxide</td><td>50 mg/m3</td></tr>
<tr><td>Total VOCs</td><td>10 mg/m3</td></tr>
</table>
These limits are based on normal operating conditions and load - temperature 0°C (273K); pressure: 101.3 kPa and oxygen: 3 per cent (dry gas). The measurement uncertainty specified in section 5.3.1 of LFTGN05 v2 2010 shall apply.
These monitoring requirements have been imposed in order to ensure ongoing compliance in accordance with BAT and MCPD and to ensure a high level of protection for the environment.
</td></tr>
<tr><td>Monitoring</td><td>
We have decided that monitoring should be carried out for the parameters listed in table S3.1, of the permit, using the methods detailed and to the frequencies specified.
Monitoring requirements have been imposed in order to prevent pollution from the CHP plant and emergency flare (Table S3.1). Monitoring requirements are incorporated in accordance with Sector Guidance, Waste Treatment BAT reference document for waste treatment and BATC conclusions document (08.2018) under Directive 2010/75/EU, IPPC Sector Guidance note S5.06, Draft AD technical guidance Note and Environment Agency guidance, LFTGN08, LFTGN05 and M2. The objective is to ensure continued efficient operation of the control systems and continued compliance
</td></tr>
</table>

Aspect considered	Decision
	with relevant legislation. The gas engines are designed such that CO and VOCs emissions are not significant. However monitoring requires the operator to undertake emissions monitoring of the gas engines 6 months following the start of site operations and annually thereafter. Process monitoring requirements have been additionally incorporated (Table S3.2) this is proportionate to the process and in accordance with Environment Agency Guidance. Based on the information in the application we are satisfied that the operator's techniques, personnel and equipment have either MCERTS certification or MCERTS accreditation as appropriate.
Reporting	We have specified reporting in the permit. Reporting of oxides of nitrogen, carbon monoxide, total VOCs and sulphur dioxide from the CHP stack is required within the first six months of commissioning the new engines and annually thereafter. This is proportionate for the process, and in accordance with Environment Agency technical guidance LFTGN08 and LFTGN05, confirming compliance with relevant benchmarks. Reporting requirements for annual production or biomethane generated (tonnes or M3) and whole digestate (tonnes), performance parameters for Water/energy consumption, raw material usage, emergency flare operation, Biomethane exported and auxiliary boiler usage (Hrs) are additionally included, these are proportionate to the process and in accordance with sector guidance IPPC S5.06, Draft AD technical guidance Note and Controlling and monitoring emissions web guidance
Operator competence	
Management system	There is no known reason to consider that the operator will not have the management system to enable it to comply with the permit conditions. The decision was taken in accordance with the guidance on operator competence and how to develop a management system for environmental permits.
Technical competence	Technical competence is required for activities permitted. The operator is a member of an agreed scheme.
Relevant convictions	The Case Management System has been checked to ensure that all relevant convictions have been declared. No relevant convictions were found. The operator satisfies the criteria in our

Aspect considered	Decision
	guidance on operator competence.
Financial competence	There is no known reason to consider that the operator will not be financially able to comply with the permit conditions.
Growth Duty	
Section 108 Deregulation Act 2015 – Growth duty	We have considered our duty to have regard to the desirability of promoting economic growth set out in section 108(1) of the Deregulation Act 2015 and the guidance issued under section 110 of that Act in deciding whether to grant this permit. Paragraph 1.3 of the guidance says: "The primary role of regulators, in delivering regulation, is to achieve the regulatory outcomes for which they are responsible. For a number of regulators, these regulatory outcomes include an explicit reference to development or growth. The growth duty establishes economic growth as a factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation." We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document above. The guidance is clear at paragraph 1.5 that the growth duty does not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections. We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.

Response received from
Public Health England 24th May 2019
Brief summary of issues raised
The main emissions of potential concern are products of combustion from CHP, boilers and flare. We note the applicant has provided detailed dispersion modelling for emissions of nitrogen oxides and sulphur dioxides but doesn't appear to have considered other pollutants such volatile organic compounds or particulate matter. The Regulator should be assured that all potentially significant emissions to air have been adequately considered. Based on the information contained in the application supplied to us, Public Health England has no significant concerns regarding the risk to the health of the local population from the installation.
Summary of actions taken or show how this has been covered
The applicant has assessed the potential impacts of point source emissions to air; air quality modelling has been undertaken of point source combustion emissions from the combined health and power (CHP) engines using AERMOD dispersion plume modelling using conservative assumptions, the applicant's air quality assessment indicates that emissions will not lead to significant impacts off-site. The applicant has undertaken modelling of emissions of concern namely NO_X and SO_2 in accordance with the Table 2 limits of the MCPD and appears not to have assessed impacts for VOC's and CO. As the CHP engines will run on gaseous fuel (Biogas) there is little potential for emissions of particulate from the combustion process. Any VOC's emissions from the CHP combustion process will be largely unburnt methane gas from slippage through the engine. VOC emissions are inversely proportionate to the NOx and carbon monoxide (CO) emissions and are monitored to ensure that the internal combustion process is optimised. The gas engines are designed such that CO and VOCs emissions are not significant. We have included emission limit values (ELV) for pollutants of concern including an annual monitoring requirement for emissions to air in accordance our technical guidance LFTGN08, LFTGN05 and MCPD. We have also required the operator to undertake emissions monitoring of the gas engines 6 months following the start of site operations (annually thereafter) to ensure that assumptions made in the application relating to the releases of pollutants to air are verified, appropriate measures are in place to prevent pollution and demonstration of compliance with emission limit values. This is considered proportionate for the process, given its environmental impact and confirms compliance with relevant benchmarks. The site will have two gas fired 0.8Mwth back up boilers to provide heat to the pasteurisation process should the CHP engines be non-operational, the boilers are expected to be required <10 days per year. Due to their size they will not be subject to the Medium Combustion Plant Directive (MCPD) and no emission limits have been. Process monitoring requirements have been additionally incorporated (Table S3.2) this is proportionate to the process and in accordance with Environment Agency Guidance.