

## Standard rules SR2010 No16

# On-farm anaerobic digestion facility including use of the resultant biogas

### Introductory note

This introductory note does not form part of these standard rules

When referred to in an environmental permit, these rules will allow the operator to carry out on-farm anaerobic digestion of wastes and also use of the biogas in compression and spark ignition engines with an aggregate rated thermal input of up to 3 megawatts. The rules also allow use of standard commercial gas turbines, fuel cells (e.g. Molten Carbonate or Solid Oxide) or treatment followed by injection into the gas grid. These rules are limited to premises used for agriculture.

Permitted wastes do not include hazardous wastes. The total quantity of waste that can be accepted at any site under these rules must not exceed 75,000 tonnes per year. Any wastes controlled by the Animal By-Products Regulations<sup>1</sup> must be treated and handled in accordance with any requirements imposed by those Regulations.

The permitted activities must not be carried out within 500 metres of a European Site<sup>2</sup>, Ramsar site or a Site of Special Scientific Interest (SSSI) (excluding any SSSI designated solely for geological features). The permitted activities must not be carried out within a specified Air Quality Management Area (AQMA)<sup>3</sup>. The activities must be outside groundwater Source Protection Zone 1. Gas engine stacks between 3 metres and 7 metres in height have to be located 200 metres from any building used by the public including dwelling houses in cases where they do not have an 'effective stack height' of 3 metres as defined by the rules.

All storage and treatment of waste solids, liquids and sludges shall also not be within:

- 10 metres of any watercourse
- 50 metres from any spring or well, or from any borehole not used to supply water for domestic or food production purposes, and
- 50 metres from any well, spring or from any borehole used for the supply of water for human consumption. This must include private water supplies.

These standard rules do not allow any emission into surface waters or groundwater except clean water from roofs and parts of the site not used for waste activity including storage of wastes. However, under the emissions of substances not controlled by emission limits rule, biogas condensate, treated digestate and waste waters may be discharged to a sewer subject to a consent issued by the local water company.

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<sup>1</sup> The Animal By-Products (Enforcement) (England) Regulations 2011 (SI 2011 No.881) and the Animal By-Products (Enforcement) (Wales) Regulations 2011 (SI 2011 No.600 W.88)

<sup>2</sup> A candidate or Special Area of Conservation (cSAC or SAC) and Proposed or Special Protection Area (pSPA or SPA) in England and Wales.

<sup>3</sup> An Air Quality Management Area which has been designated due to concerns about nitrogen dioxide.

**End of Introductory Note**

# Rules

## 1 – Management

### 1.1 General management

1.1.1 The operator shall manage and operate the activities:

- (a) in accordance with a written management system 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; and
- (b) using sufficient competent persons and resources.

1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.

1.1.3 Any person having duties that are or may be affected by the matters set out in these standard rules shall have convenient access to a copy of them kept at or near the place where those duties are carried out.

1.1.4 The operator shall comply with the requirements of an approved competence scheme.

### 1.2 Avoidance, recovery and disposal of wastes produced by the activities

1.2.1 The operator shall take appropriate measures to ensure that:

- (a) the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste by the activities; and
- (b) any waste generated by the activities is treated in accordance with the waste hierarchy referred to in Article 4 of the Waste Framework Directive; and
- (c) where disposal is necessary, this is undertaken in a manner which minimises its impact on the environment.

The operator shall review and record at least every four years whether changes to those measures should be made and take any further appropriate measures identified by a review.

## 2 – Operations

### 2.1 Permitted activities

2.1.1 The operator is only authorised to carry out the activities specified in table 2.1 below ("the activities").

<b>Table 2.1 Activities</b>	
<b>Description of activities</b>	<b>Limits of activities</b>
<p><b>R13:</b> Storage of wastes pending the operations numbered R1, R3 and D10</p> <p><b>R3:</b> Recycling or reclamation of organic substances that are not used as solvents</p> <p><b>R1:</b> Use principally as a fuel or other means to generate energy.</p> <p><b>D10:</b> Incineration on land</p>	<p>All activities must be carried out on premises used for Agriculture.</p> <p>Treatment of waste including shredding, sorting, screening, compaction, baling, mixing and maceration.</p> <p>Digestion of wastes including pasteurisation and chemical addition</p> <p>Gas cleaning by biological or chemical scrubbing.</p> <p>Gas storage and drying</p> <p>Treatment of digestate including screening to remove plastic residues, centrifuge or pressing, addition of thickening agents (polymers) or drying.</p> <p>Composting and maturation of digestate</p> <p>The total quantity of waste accepted at the site shall be less than 75,000 tonnes a year.</p> <p>The use of combustible gases produced as a by-product of the anaerobic digestion process as fuel.</p> <p>Except for the auxiliary flare, the aggregate rated thermal input of all appliances used to burn biogas shall be less than 3 megawatts.</p> <p>Use of an auxiliary flare required only for short periods of breakdown or maintenance of the facility.</p>

2.1.2 All process plant and equipment shall be commissioned, operated and maintained, and shall be fully documented and recorded, in accordance with the manufacturers recommendations.

## 2.2 The site

2.2.1 The activities shall not extend beyond the site, being the land shown edged in green on the site plan attached to the permit.

2.2.2 The activities shall not be carried out within:

- (a) 500 metres of a European Site or a Site of Special Scientific Interest (SSSI);
- (b) a specified AQMA;
- (c) a groundwater Source Protection Zone 1
- (d) 50 metres from any well, spring or borehole not used to supply water for domestic or food production purposes, and

(e) 50 metres from any well, spring or from any borehole used for the supply of water for human consumption. This must include private water supplies.

(f) 10 metres of any watercourse

2.2.3 The distance of gas engine stacks from any building used by the public including dwelling houses shall be as specified in table 2.2 below

<b>Table 2.2 Distance of gas engine stacks from buildings used by the public</b>	
<b>Stack</b>	<b>Distance from buildings used by the public (metres)</b>
Effective stack height is 3 metres	0
Stack height is 7 metres	0
Stack height is > 3 metres and <7 metres	200

## 2.3 Waste acceptance

2.3.1 Waste shall only be accepted if:

- (a) it is of a type and quantity listed in tables 2.1 and 2.3 of these rules; and;
- (b) it conforms to the description in the documentation supplied by the producer and holder.

2.3.2 Records demonstrating compliance with rule 2.3.1 shall be maintained.

<b>Table 2.3 Waste Types</b>	
<b>Waste Code</b>	<b>Description</b>
<b>02</b>	<b>WASTES FROM AGRICULTURE, HORTICULTURE, AQUACULTURE, FORESTRY, HUNTING AND FISHING, FOOD PREPARATION AND PROCESSING</b>
<b>02 01</b>	<b>wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing</b>
02 01 01	sludges from washing and cleaning – food processing waste, food washing waste
02 01 03	plant tissue waste - husks, cereal dust, waste animal feeds
02 01 06	animal faeces, urine, manure including spoiled straw
<b>02 05</b>	<b>wastes from the dairy products industry</b>
02 05 01	biodegradable materials unsuitable for consumption or processing (other than those containing dangerous substances) – solid and liquid dairy products, milk, food processing wastes, yoghurt, whey
02 05 02	sludges from on-site effluent treatment

## 2.4 Operating techniques

2.4.1 The activities shall be operated using the techniques and in the manner described in Table 2.4 below.

<b>Table 2.4 Operating techniques</b>
<p>1) All storage and treatment of waste solids, liquids and sludges shall comply with the following distances:  <b>10 metres of any watercourse</b>  <b>50 metres from any spring or well, or from any borehole not used to supply water for domestic or food production purposes, and</b>  <b>50 metres from any well, spring or from any borehole used for the supply of water for human consumption.</b></p> <p>2) All waste solids, liquids and sludges shall be securely stored.</p>

- 3) All storage and process tanks shall be fit for purpose and be constructed and maintained to a recognized standard with appropriate leak detection.
- 4) Digestate shall be stored within containers or lagoons and should be of a design and capacity fit for purpose. The lagoon shall have a free board of 750mm.
- 5) Gas engine stack height shall be no less than 3 metres.
- 6) All biogas condensate shall be discharged into a sealed drainage system.
- 7) Emissions of unburned biogas and the operation of the auxiliary flare shall be minimised. Any significant emissions of unburned biogas (including the operation of the pressure relief valves associated with biogas storage) and the operation of the auxiliary flare shall be recorded.

## 3 – Emissions and monitoring

### 3.1 Emissions to air, water or land

3.1.1 There shall be no point source emissions to air, water or land, except from the sources and emission points listed in table 3.1

3.1.2 The limits given in table 3.1 shall not be exceeded.

<b>Table 3.1 Point source emissions to air - emission limits and monitoring requirements</b>			
<b>Emission Point and Source</b>	<b>Parameter</b>	<b>Limit (including units)</b>	<b>Monitoring Frequency and Standard or Method</b>
Stacks on engines	Oxides of Nitrogen	500 mg/m <sup>3</sup>	Annual monitoring  Monitoring equipment, techniques, personnel and organisations employed for the engine stack emissions monitoring programme (including the measurement of exhaust gas temperature) shall have either MCERTS certification or MCERTS accreditation (as appropriate).
	Carbon monoxide	1400 mg/m <sup>3</sup>	
	Sulphur dioxide	350 mg/m <sup>3</sup>	
	Total volatile organic compounds including methane	1000 mg/m <sup>3</sup>	
	Non methane volatile organic compounds	75 mg/m <sup>3</sup> Emission levels at Normal Temperature and Pressure and 5%O <sub>2</sub> , unless otherwise agreed in writing by the Environment Agency  Minimum stack exit velocity of 15 m/s to ensure effective plume breakaway	
Stacks on boilers burning biogas	Oxides of Nitrogen	No limit set	None specified
	Carbon monoxide	No limit set	
Auxiliary flare	Oxides of Nitrogen	No limit set	None specified
	Carbon monoxide	No limit set	
Pressure relief valves	Biogas	No limit set	None specified

## **3.2 Emissions of substances not controlled by emission limits**

- 3.2.1 Emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution. The operator shall not be taken to have breached this rule if appropriate measures, including, but not limited to, those specified in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions.
- 3.2.2 The operator shall:
- (a) if notified by the Environment Agency that the activities are giving rise to pollution, submit to the Environment Agency for approval within the period specified, an emissions management plan;
  - (b) implement the approved emissions management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.
- 3.2.3 All liquids in containers, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise leakage and spillage from the primary container.

## **3.3 Odour**

- 3.3.1 Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where that is not practicable, to minimise, the odour.
- 3.3.2 The operator shall:
- (a) maintain and implement an odour management plan;
  - (b) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to odour, submit to the Environment Agency for approval within the specified period, a revised odour management plan;
  - (c) implement any approved revised odour management plan from the date of approval, unless otherwise agreed in writing by the Environment Agency.

## **3.4 Noise and vibration**

- 3.4.1 Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan, to prevent or where that is not practicable, to minimise, the noise and vibration.
- 3.4.2 The operator shall:
- (a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to noise and vibration, submit to the Agency for approval within the period specified, a noise and vibration management plan;
  - (b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

## **3.5 Monitoring**

- 3.5.1 The operator shall, unless otherwise agreed in writing by the Environment Agency, undertake the monitoring specified in table 3.1.

- 3.5.2 The operator shall maintain records of all monitoring required by these standard rules including records of the taking and analysis of samples, instrument measurements (periodic and continual), calibrations, examinations, test and surveys and any assessment or evaluation made on the basis of such data.

## 4 – Information

### 4.1 Records

- 4.1.1 All records required to be made by these standard rules shall:
- (a) be legible;
  - (b) be made as soon as reasonably practicable;
  - (c) if amended, be amended in such a way that the original and any subsequent amendments remain legible or are capable of retrieval; and
  - (d) be retained, unless otherwise agreed by the Environment Agency, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:
    - (i) off-site environmental effects; and
    - (ii) matters which affect the condition of land and groundwater
- 4.1.2 The operator shall keep on site all records, plans and the management system required to be maintained by these standard rules, unless otherwise agreed in writing by the Environment Agency.

### 4.2 Reporting

- 4.2.1 The operator shall send all reports and notifications required by these standard rules to the Environment Agency using the contact details supplied in writing by the Environment Agency.
- 4.2.2 Within one month of the end of each quarter, the operator shall submit to the Environment Agency using the form made available for the purpose, the information specified on the form relating to the site and the waste accepted and removed from it during the previous quarter.

### 4.3 Notifications

- 4.3.1 The Environment Agency shall be notified without delay following the detection of:
- (a) any malfunction, breakdown or failure of equipment or techniques, accident or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution;
  - (b) the breach of a limit specified in these standard rules; or
  - (c) any significant adverse environmental effects.
- 4.3.2 Written confirmation of actual or potential pollution incidents and breaches of emission limits shall be submitted within 24 hours.
- 4.3.3 Where the Environment Agency has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Environment Agency when the relevant monitoring and/or spot sampling is to take place. The operator shall provide this information to the Environment Agency at least 14 days before the date the monitoring is to be undertaken.
- 4.3.4 The Environment Agency shall be notified within 14 days of the occurrence of the following matters except where such disclosure is prohibited by Stock Exchange rules:
- a) Where the operator is a registered company:
    - any change in the operator's trading name, registered name or registered office address;

- and
  - any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.
- b) Where the operator is a corporate body other than a registered company:
  - any change in the operator's name or address; and
  - any steps taken with a view to the dissolution of the operator.
- c) In any other case:
  - the death of any of the named operators (where the operator consists of more than one named individual);
  - any change in the operator's name(s) or address(es);and
  - any steps taken with a view to the operator, or any one of them, going into bankruptcy, entering into a composition or arrangement with creditors, or, in the case them being in a partnership, dissolving the partnership.

## 4.4 Interpretation

4.4.1 In these standard rules the expressions listed below shall have the meaning given.

4.4.2 In these standard rules references to reports and notifications mean written reports and notifications, except when reference is being made to notification being made "without delay", in which case it may be provided by telephone.

*"accident"* means an accident that may result in pollution.

*"anaerobic digestion"* means a process of controlled decomposition of biodegradable materials under managed conditions where free oxygen is absent, at temperatures suitable for naturally occurring mesophilic or thermophilic anaerobe and facultative anaerobe bacteria species, which convert the inputs to a methane-rich biogas and whole digestate.

*"agriculture"* means as defined in The Agriculture Act 1947 including:-"horticulture, fruit growing, seed growing, dairy farming and livestock breeding and keeping, the use of land as grazing land, meadow land, osier land, market gardens and nursery grounds, and the use of land for woodlands where that use is ancillary to the farming of the land for other agricultural purposes, and 'agriculture' shall be constructed accordingly"

*"animal waste"* means any waste consisting of animal matter that has not been processed into food for human consumption

*"authorised officer"* means any person authorised by the Environment Agency under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in Section 108(4) of that Act.

*"D"* means a disposal operation provided for in Annex IIA to Directive 2006/12/EC of the European Parliament and of the Council of 5 April 2006 on Waste.

*"digestate"* means material resulting from an anaerobic digestion process

*"domestic purposes"* has the same meaning as in section 218 of the Water Industry Act 1991.

*"emissions of substances not controlled by emission limits"* means emissions of substances to air, water or land from the activities, either from the emission points specified in these standard rules or from other localised or diffuse sources, which are not controlled by an emission limit.

*"European Site"* means a European site within the meaning of Regulation 8 of the Conservation of Habitats and Species Regulations 2017.

*"food production purposes"* means the manufacturing, processing, preserving or marketing purposes with respect to food or drink for which water supplied to food production premises may be used, and for the purposes of this definition "food production purposes" means premises used for the purposes of a business of preparing food or drink for consumption otherwise than on the premises.

*"Gas engine effective stack height"* means:

- a) If away from buildings actual stack height is no less than 3 metres.
- b) If attached to or on top of a building the stack tip must be no less than 3 metres above roof ridge.



- c) If there are other buildings within a distance of 5L from the point of discharge, the top of the stack must be no less than 3 metres above the roof ridge of the highest building. L is the lesser of the two measurements of building height and maximum width of the building.

*“groundwater”* means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

*“groundwater Source Protection Zone”* has the meaning given in the document titled “Groundwater Protection: Policy and Practice” published by the Environment Agency in 2006.

*“impermeable surface”* means a surface or pavement constructed and maintained to a standard sufficient to prevent the transmission of liquids beyond the pavement surface, and should be read in conjunction with the term “sealed drainage system” (below).

*“MCERTS”* means the Environment Agency’s Monitoring Certification Scheme.

*“pollution”* means emissions as a result of human activity which may—

- (a) be harmful to human health or the quality of the environment,
- (b) cause offence to a human sense,
- (c) result in damage to material property, or
- (d) impair or interfere with amenities and other legitimate uses of the environment.

*“quarter”* means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October.

*“R”* means a recovery operation provided for in Annex IIB to Directive 2006/12/EC of the European Parliament and of the Council of 5 April 2006 on Waste.

*“sealed drainage system”* in relation to an impermeable surface, means a drainage system with impermeable components which does not leak and which will ensure that:

- (a) no liquid will run off the surface otherwise than via the system;
- (b) except where they may lawfully be discharged to foul sewer, all liquids entering the system are collected in a sealed sump.

*“secure storage”* means storage where waste cannot escape and members of the public do not have access to it.

*“site”* means the location where waste storage and treatment activities can take place.

*“specified AQMA”* means an air quality management area within the meaning of the Environment Act 1995 which has been designated due to concerns about oxides of nitrogen.

*“SSSI”* means Site of Special Scientific Interest within the meaning of the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000).

*“year”* means calendar year commencing on 1<sup>st</sup> January.

## **End of standard rules**