

**Generic risk assessment for draft standard rules set number SR2009 No 4 v4.0**
**Standard Facility:**

 Waste Recovery Operation: **combustion of biogas in engines at sewage treatment works (<5Mw)**
**Location:**

Applies to all potential locations.

**Risk assessment carried out by:**

Environment Agency

**Date:**

04-May-18

The scope of the permit and associated rules is defined by the following risk criteria:

- Parameter 1 Permitted activities - The storage and recovery of waste (R13, R1,) **and incineration of biogas**
- Parameter 2 Permitted wastes - **biogas from sewage sludge digesters**
- Parameter 3 **Except for the auxiliary flare, the aggregate rated thermal input of all appliances used to burn biogas must be less than 5 megawatts.**
- Parameter 4 **Maximum quantity of animal waste, including animal carcasses, shall be limited to 10 tonnes per day [this excludes manures and slurries]**
- Parameter 5 The activities shall not be carried out within **500 metres** of a European site or Site of Special Scientific Interest (excluding those designated solely for geological features).
- Parameter 6 The activities must not be carried out within 200 metres of the nearest sensitive receiver
- Parameter 7 The activities must not be carried out within an Air Quality Management Area (AQMA). **Gas engines stacks 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.**

Abbreviations:

SR - Standard Rule  
 NOx - Oxides of nitrogen  
 CO - Carbon Monoxide  
 TVOC **Total Volatile Organic compounds**  
 Sox **Sulphur Dioxide**  
 CHP - Combined heat and power  
 SR (emissions of substances not controlled by emission limits) - emissions of substances .... shall not cause pollution...., with appropriate measures:  
**effective** gas engine stack height shall be no less than 3 metres;  
 all biogas condensate shall be discharged into a sealed drainage system; fugitive emissions of biogas shall be prevented.

Data and information				Judgement				Action (by permitting)	
Receptor	Source	Harm	Pathway	Probability of exposure	Consequence	Magnitude of risk	Justification for magnitude	Risk management	Residual risk
What is at risk? What do I wish to protect?	What is the agent or process with potential to cause harm?	What are the harmful consequences if things go wrong?	How might the receptor come into contact with the source?	How likely is this contact?	How severe will the consequences be if this occurs?	What is the overall magnitude of the risk?	On what did I base my judgement?	How can I best manage the risk to reduce the magnitude?	What is the magnitude of the risk after management? (This residual risk will be controlled by Compliance Assessment).
Local human population.	<b>Releases of NO2 and SO2, CO and Total Volatile Organic Compounds (TVOC)</b>	Harm to human health - respiratory irritation and illness.	Air transport then inhalation.	Low	Medium	<b>Medium</b>	There is potential for exposure to anyone living close to the site or at locations where members of the public might be regularly exposed.	Activities shall be managed and operated in accordance with a management system (will include inspection and maintenance of equipment, including engine management systems), point source emissions to air with emission limits for <b>Oxides of Nitrogen (NO2) Carbon Monoxide (CO) , Sulphur Dioxides SO2 and Total Volatile Organic Compounds (TVOC) .</b> The activities shall not be carried out within an AQMA zone. <b>Effective stack height must be 3m.</b>	Low

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What is at risk? What do I wish to protect?	What is the agent or process with potential to cause harm?	What are the harmful consequences if things go wrong?	How might the receptor come into contact with the source?	How likely is this contact?	How severe will the consequences be if this occurs?	What is the overall magnitude of the risk?	On what did I base my judgement?	How can I best manage the risk to reduce the magnitude?	What is the magnitude of the risk after management? (This residual risk will be controlled by Compliance Assessment).
Local human population.	Point source emissions to air	Harm to human health - respiratory irritation and illness.	Air transport then inhalation.	Low	Medium	Low	Monitoring of CHP and Generators will be in line with permitted limits and monitored and expressed as per TGN M2.	As above and point source emissions to air with emission limits	Low
Local human population	Release of unburnt biogas	Harm to human health - respiratory irritation and illness. Release of potent climate change gases.	Air transport	Medium	High	Medium	Potential for release in emergency and maintenance via pressure relief valves	Auxiliary flare are available and used but limited to emergency situation and planned maintenance. Pressure relief valves are inspected regularly. Unplanned releases are reported.	
Local human population	Release of microorganisms (bioaerosols)	Harm to human health - respiratory irritation and illness.	Air transport then inhalation	Medium	High	Medium	Potential for release at waste reception/treatment and maturation	Maturation activities are not carried out in the open within 250m metres of the nearest sensitive receiver.. Operations have to take place within a closed system with appropriate filters or scrubbing system.	
Local human population	Odour	Nuisance, loss of amenity	Air transport then inhalation.	Medium	Medium	Medium	Local residents often sensitive to odour. Wide range of waste may cause odour issues at reception from wastes, release of biogas and from digestate hence control measures adopted.	Emissions shall be free from odorous compounds. An odour management plan is required. Non- point source emissions of biogas shall be minimised using appropriate measures. All storage tanks and lagoons are required to be covered also AD is an enclosed process. A buffer zone for odour has been kept at 200 metres from the nearest sensitive receiver so that below this limit odour control can be assessed in a bespoke permit.	Low
Local human population	Noise and vibration	Nuisance, loss of amenity, loss of sleep.	Noise through the air and vibration through the ground.	Low	Low	Low	Local residents often sensitive to noise and vibration but there is low potential for exposure.	Noise and vibration shall be minimised and not cause nuisance. A noise and vibration management plan may be required.	Low
Local human population and / or livestock after gaining unauthorised access to the installation	All on-site hazards: machinery.	Bodily injury	Direct physical contact	Low	Medium	Low	Direct physical contact is minimised by activity being carried out within enclosed digesters so a low magnitude risk is estimated.	Activities shall be managed and operated in accordance with a management system (will include site security measures to prevent unauthorised access).	Low
Local human population and local environment.	Arson and / or vandalism causing the release of polluting materials to air (smoke or fumes), water or land.	Respiratory irritation, illness and nuisance to local population. Injury to staff, fire fighters or arsonists/vandals. Pollution of water or land.	Air transport of smoke. Spillages and contaminated firewater by direct run-off from site and via surface water drains and ditches.	Medium	High	Medium	Although biogas is flammable, risk of direct physical contact is reduced by activity being carried out within enclosed systems.	As above. An accident management plan is required as part of management system (will include fire and spillages).	Low

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What is at risk? What do I wish to protect?	What is the agent or process with potential to cause harm?	What are the harmful consequences if things go wrong?	How might the receptor come into contact with the source?	How likely is this contact?	How severe will the consequences be if this occurs?	What is the overall magnitude of the risk?	On what did I base my judgement?	How can I best manage the risk to reduce the magnitude?	What is the magnitude of the risk after management? (This residual risk will be controlled by Compliance Assessment).
Local human population and local environment.	Accidental explosion of biogas.	Respiratory irritation, illness and nuisance to local population. Injury to staff, fire fighters or arsonists/vandals. Pollution of water or land.	Air transport . Spillages and digestate direct run-off from site and via surface water drains and ditches.	Low	High	Medium	Unlikely to happen - reduced by effective management systems.	Management systems required to include <b>DSEAR assessment</b> . Bunding of tanks etc.	Low
Local human population and local environment	Accidental fire causing the release of polluting materials to air (smoke or fumes), water or land.	Respiratory irritation, illness and nuisance to local population. Injury to staff or fire fighters. Pollution of water or land.	As above.	Low	Medium	Medium	Risk of accidental combustion of waste is moderate.	As above	Low
All surface waters close to and downstream of site.	Spillage of liquids, including oil.	Acute effects: fish kill	Direct run-off from site across ground surface, via surface water drains, ditches etc.	Low	Medium	Low	Potential for spillage from digestions tanks and storage vessels.	SR - Digestion tanks require appropriate bunding SR - no point source emissions to water. Run off restricted by SR on emissions of substances not controlled by emission limits.... with appropriate measures: all biogas condensate shall be discharged into a sealed drainage system. Impermeable surface required for storage of all wastes.	Low
All surface waters close to and downstream of site.	As above	Chronic effects: deterioration of water quality	As above. Indirect run-off via the soil layer	Low	Medium	Low	As above	As above	Low
Abstraction from watercourse downstream of facility (for agricultural or potable use).	As above	Acute effects, closure of abstraction intakes.	Direct run-off from site across ground surface, via surface water drains, ditches etc. then abstraction.	Low	Medium	Low	Watercourse must have medium / high flow for abstraction to be permitted, which will dilute contaminated run-off.	As above	Low
Groundwater	As above	Chronic effects: contamination of groundwater, requiring treatment of water or closure of borehole.	Transport through soil/groundwater then extraction at borehole.	Low	Medium	Low	Potential for spillage from digestions tanks and storage vessels.	As above. Activities cannot take place within groundwater protection zone 1 or if a source protection zone has not been defined then within 50 metres of any well, spring or borehole used for the supply of water for human consumption. This must include private water supplies. Impermeable surface required for AD plant.	Low

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Protected nature conservation sites - European sites and SSSIs.	Any, but principally NOx.	Harm to protected site through toxic contamination, nutrient enrichment, disturbance etc.	Any	Low	Medium	Low	Emissions to air may cause harm to and deterioration of nature conservation sites.	Emissions of substances not controlled by emission limits (excluding odour and noise) 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. At 500 metres or above, the potential hazards from the permitted activities pose a low risk to the broad sensitivity of species and habitats groups. The standard permit only applies at this distance or more. Emission limits for stack gases are specified.	Low

**Notes:** Red triangle indicates comment containing supporting information

Yellow columns contain drop down menus that allow automatic evaluation of risk in green column