Odour Management Plan

Home Farm Grange

January 2026

Project No.: SOL_25_P007_ENG

...consulting sustainability

sol environment

Document Details	
Document Title	Odour Management Plan
Document Subtitle	Home Farm Grange
Project No.	SOL_25_P007_ENG
Date	January 2026
Version	QMS_7.5.38_TEM – Template – Report Long Form – New Style (Perm) v5
Author	Rhys Morgan
Client Name	Engie Renewable Gases UK Ltd

Document History				
Version	Comments	Date	Author Initials	Reviewer Initials
I1	Issue to EA	November 2025	RM	EH
I2	Reissue following EA Comment	January 2026	RM	EH

Signature Page

January 2026

Odour Management Plan

Home Farm Grange

Rhys Morgan
Environmental Consultant

Emily Hingston
Client & Project Manager

This report has been prepared by Sol Environment with all reasonable skill, care, and diligence, and taking account of the Services and the Terms agreed between Sol Environment Ltd and the Client. This report is confidential to the client, and Sol Environment accepts no responsibility whatsoever to third parties to whom this report, or any part thereof, is made known, unless formally agreed by Sol Environment Ltd beforehand. Any such party relies upon the report at their own risk.

Sol Environment disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the Services

Registered office: 10 The Lees, Malvern, Worcestershire, WR14 3HT

Company Registered in England no. 7068933

Sol is ISO 9001:2015 certified by British Assessment Bureau Limited, a UKAS Accredited Certification Body number 8289 for the scope of Environmental Consultancy providing a range of services to companies in the UK and Europe. Certificate number: 259774.

CONTENTS

List of Tables

List of Figures

1. INTRODUCTION

This document has been prepared by Sol Environment Ltd on the behalf of Engie Renewable Gases Ltd ("Engie" hereafter) in support of its Environmental Permit Application relating to their proposed site at Home Farm Grange at Land East of A162, Low Farm, South Milford, Sherburn in Elmet, LS25 6FW. The National Grid Reference for the site is SE 50420 32210.

The document provides a structured framework and approach in effectively managing potential odour releases associated with the operations at the site.

This Odour Management Plan document (referred hereafter as the 'OMP') has been produced in accordance with the following documents:

- Environment Agency Technical Guidance '*Odour Management: comply with your environmental permit'* published online 3rd December 2025;
- Environment Agency's Technical Horizontal Guidance Note '*H4: Odour Management: How to comply with your permit' (now withdrawn)*; and
- General monitoring procedures detailed in Environment Agency guidance document Internal Guidance for the *Regulation of Odour at Waste Management Facilities*.

The purpose of this document is to outline the management control measures that have been established to prevent and control odour emissions and associated impacts from the site.

1.1 Structure of Odour Management Plan

The OMP has been structured in accordance with the EA *H4 Odour Management Plan Guidance (since withdrawn),* and the latest version of the Odour Management guidance, published on 3rd December 2025.

This OMP has been developed to clearly define measures which will be implemented on site to what control and/or prevent odour. The potential measures considered are in-line with the available guidance and include the following:

- Receipt and Management of Odorous Materials;
- Transfer of Chemicals to Air;
- Containment of Contaminated Air;
- End of Pipe Treatment;
- Engaging your Neighbours;
- Response to Complaints;
- Ceasing or Reducing Operations; and
- Accident Management Plan.

The OMP considers the following aspects of the facility:

- Activities that have the potential to produce odour and sources of release;
- Actions to mitigate the effect of odour release (during normal and abnormal operations);
- Details of the sites monitoring regime;

- Details of responsible persons at the installation; and
- Potential outcomes of each failure scenario in respect to odour impact.

1.2 Responsibility for Implementing, Maintaining, and Reviewing the Odour Management Plan

Primary responsibility for the implementation, maintenance and review of this Odour Management Plan falls to the competent Site Operations Manager. The Site Operations Manager is responsible for ensuring all staff are trained in the contents of this management plan and that operational procedures align with the objectives of this management plan. Training is undertaken in the style of "toolbox talks" – a common practice in industry for delivering training. New staff members are trained by the Site Operations Manager (or other competent senior staff member prior to beginning their role. Refresher training is delivered to all staff annually, or when significant changes/updates have been made.

This plan is stored electronically on site, within the company's document library, and a physical copy is stored in the site office for easy access by site staff. This plan is reviewed on an annual basis as part of the site's annual environmental review of all protection measures and methodologies.

1.3 Status of Odour Management Plan

The OMP is a "live" document and will form part of the key environmental management documents for the facility. All monitoring procedures, responsibilities and compliance actions will be updated as and when required.

Any revisions in the OMP or associated Annexes will be updated and inserted accordingly.

2. SITE DETAILS

2.1 Site Location

The proposed site is located at Land East of A162, Low Farm, South Milford, Sherburn in Elmet, LS25 6FW.

The National Grid Reference for the centre of the proposed site is SE 50420 32210.

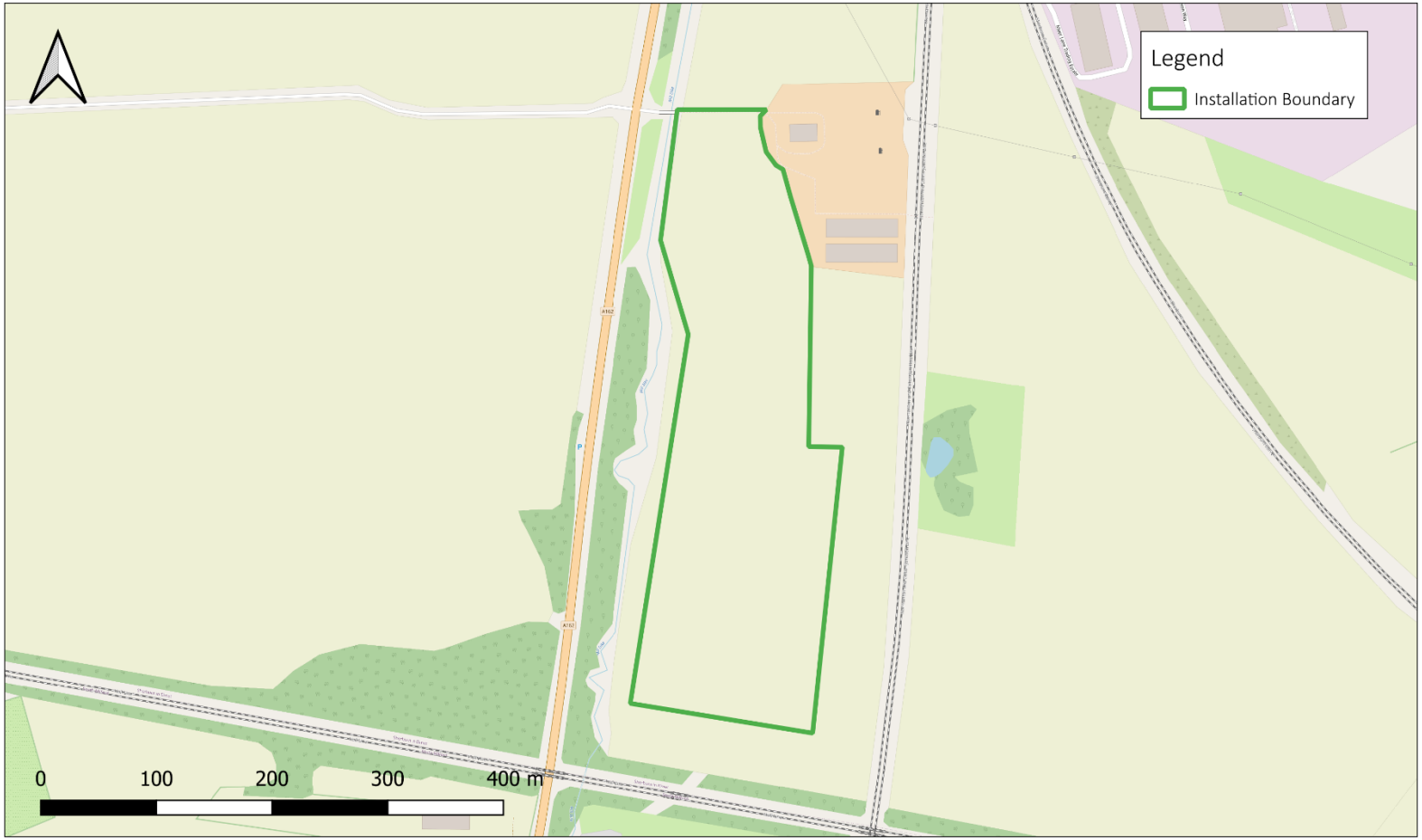
2.2 Site Description

Engie's proposed AD plant will accept up to 100,000 tonnes per annum of feedstock including manures and slurries, maize, silage, whole crop rye, vegetable waste and potato rejects from Home Farm and other local farms. Biogas produced by the AD plant will be upgraded and exported to the grid, and the digestate, which will meet PAS 110 accreditation, will be used for agricultural land improvement.

The site will comprise of the following key infrastructure, as well as a collection of ancillary infrastructure:

- Silage Clamps;
- Feedstock Reception Building;
- Feeders;
- Liquid Feed Tanks;
- 1 x Digestion Tank;
- 2 x Post Digesters;
- Biogas Upgrading Plant;
- 2 x Natural Gas Gensets;
- Digestate Lagoon;
- Grid Connection infrastructure;
- CO2 Building;
- Separator Building;
- Bund (4m in height surrounding tank area).

.



Project Number: SOL_25_P007_ENG Doc Ref: Annex B - Site Plans Map Title: Installation Boundary Date: 26/03/2025 Drawn by: RM Checked by: EH	Site Address: Land East of A162, Halstow Energy AD Facility Low Farm South Milford Sherburn in Elmet LS25 6FW	1. Do not scale off this drawing 2. All dimensions to be confirmed on site 3. This drawing is copyright of Sol Environment Ltd 4. This drawing is to be read in conjunction with relevant consultant drawings and specifications 5. QMS Reference: QMS_7.5.39_TEM - Template - GIS Drawing - Horizontal v1

sol environment
a: Unit 5.3 The Paintworks, Bath Road, Bristol, BS4 3EH
w: www.sol-environment.co.uk
e: enquiries@sol-environment.co.uk
t: 01684 572727

Figure 2.1 - Site Location

Figure 2.2 - Installation Layout Plan

2.3 Site Context

The following sections outline the site context, including the proposed boundary and layout, surrounding site setting and any nearby sensitive receptors.

2.3.1 Site Setting

The site is located in a mixed-use landscape, comprising of a blend of industrial, commercial (including agriculture), residential and recreational assets, as well as prominent ecological features. Table 2-1 outlines the surrounding site setting in greater detail, including features in the immediate vicinity, within 500m and beyond 500m of the proposed site.

Table 2.1 - Site Setting

Direction	Description
North	Immediate Vicinity: Agricultural Land, Low Farm Energy AD Plant Within 500m: Agricultural Land, Bypass Park Estate, Commercial Units including YDL Distribution, David Wattson Transport, and Bishop's Move York Beyond 500m: Agricultural Land, Residential housing and local amenities in Sherburn in Elmet, A162 Road, Surface Water Lagoon, commercial units including The Great Bear, Esterform Packaging, and Sherburn Motor Spares
East	Immediate Vicinity: Agricultural Land, small woodland block Within 500m: Agricultural Land, Railway Line Beyond 500m: Agricultural Land, Sherburn in Elmet Airfield Airport (EGCJ), Breeze Aviation Services Ltd, Gascoigne Wood Power Plant
South	Immediate Vicinity: Agricultural Land, Railway Line Within 500m: Agricultural Land, Maltings Tea Rooms, Floosie Brow Artist, Woodhaven Boarding Kennels and Cattery Beyond 500m: Amur AD Plant, The Maltings Organic Treatment, Residential Housing and local amenities in South Milford, Agricultural Land, Railway Line
West	Immediate Vicinity: Mill Dike Within 500m: A162 road, Agricultural Land, small woodland Beyond 500m: Residential housing on Milford Road, Tadcaster Timber Products, Agriclutral Land, South Milford railway station, YWT Sherburn Willows Nature Reserve,

2.3.2 Nearby Sensitive Receptors

The nearest residential areas to the site are on Mill Lane, located approximately 150m south of the site boundary. Table 2.2 details the identified human receptors relevant to the site:

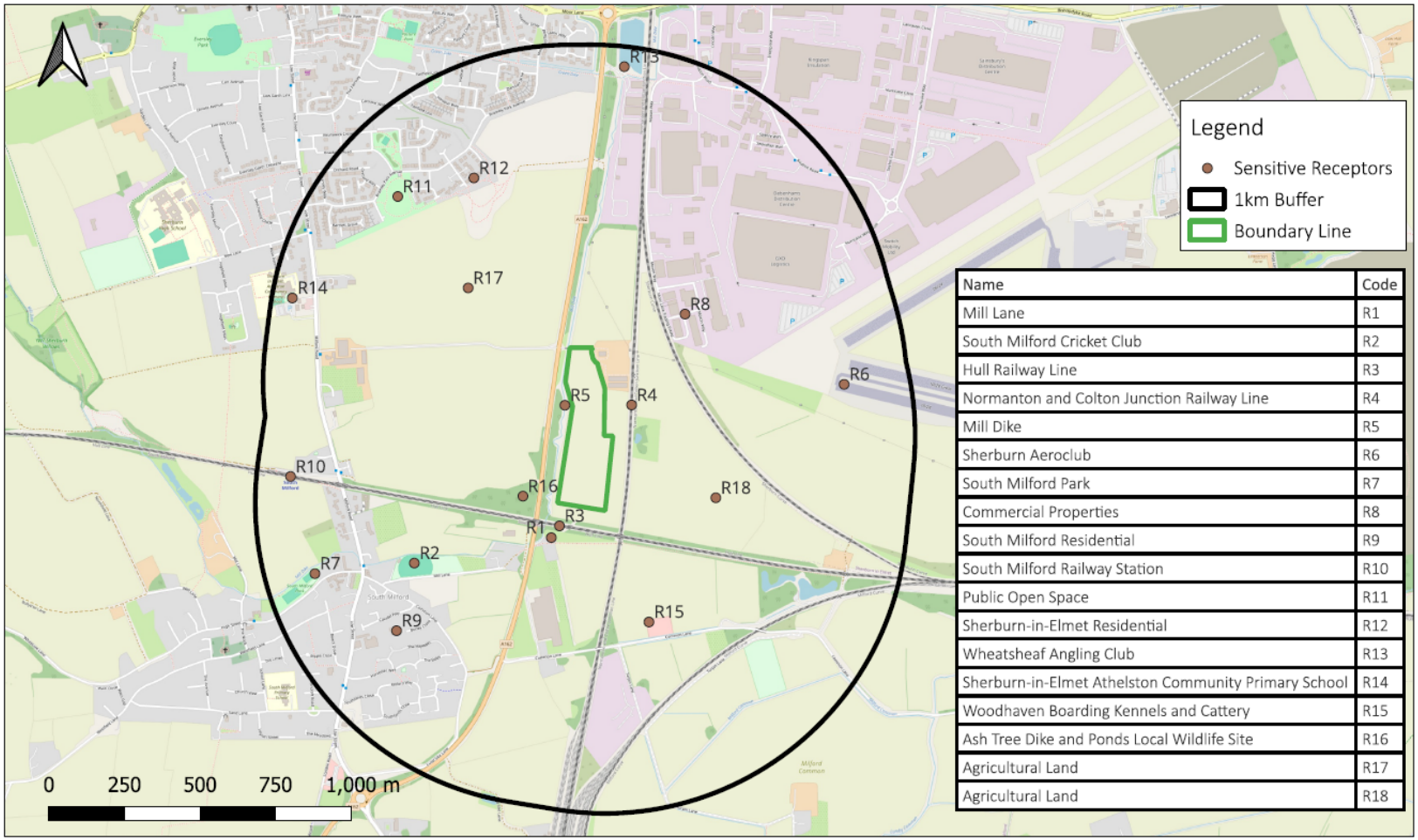
Table 2.2 - Human Receptors

Receptor Name	Distance from Site
Mill Lane	150m S
Maltings Tea Room	330m S
Milford Plants	330m S
Residential properties (Common Lane)	530m S
South Milford (residential housing)	550m SW
South Milford Cricket Club	410m SW
South Milford Football Club	430m SW
South Milford Home Farm	650m W
Residential housing – Milford Road	870m NW

Public open space	770m NW
Bypass Park Estate	430m N
Wheatsheaf Angling Club	940m N
Commercial and Industrial Estate	300m-1.72km NE
Sherburn Aeroclub	890m E
Woodhaven Boarding Kennels and Cattery	500m SE

Figure 2.3 shows the sensitive receptors identified as relevant to the site.

Due to the proximity of the site to human and ecological receptors, the site could be considered to be moderately sensitive in relation to potential emissions, such as odour. However, numerous operational measures for the control and mitigation of emissions have been applied to site to ensure that all potential releases are prevented, therefore reducing this risk.



Name	Code
Mill Lane	R1
South Milford Cricket Club	R2
Hull Railway Line	R3
Normanton and Colton Junction Railway Line	R4
Mill Dike	R5
Sherburn Aeroclub	R6
South Milford Park	R7
Commercial Properties	R8
South Milford Residential	R9
South Milford Railway Station	R10
Public Open Space	R11
Sherburn-in-Elmet Residential	R12
Wheatsheaf Angling Club	R13
Sherburn-in-Elmet Athelston Community Primary School	R14
Woodhaven Boarding Kennels and Cattery	R15
Ash Tree Dike and Ponds Local Wildlife Site	R16
Agricultural Land	R17
Agricultural Land	R18

Project Number: SOL_25_P007_ENG Doc Ref: Annex A - Site Plans Map Title: Sensitive Receptors (Home Farm Grange) Date: 03/04/2025 Drawn by: RM Checked by: EH	Site Address: Land East of A162, Halstow Energy AD Facility Low Farm South Milford Sherburn in Elmet LS25 6FW	1. Do not scale off this drawing 2. All dimensions to be confirmed on site 3. This drawing is copyright of Sol Environment Ltd 4. This drawing is to be read in conjunction with relevant consultant drawings and specifications 5. QMS Reference: QMS_7.5.39_TEM - Template - GIS Drawing - Horizontal v1

sol environment
a: Unit 5.3 The Paintworks, Bath Road, Bristol, BS4 3EH
w: www.sol-environment.co.uk
e: enquiries@sol-environment.co.uk
t: 01684 572727

Figure 2.3 - Sensitive Receptors

2.3.3 Wind Direction

The estimated wind direction for the proposed site comes from a predominantly westerly direction, based on historic wind direction recordings taken from the former RAF Church Fenton located approximately 5.40 km northeast of the site.

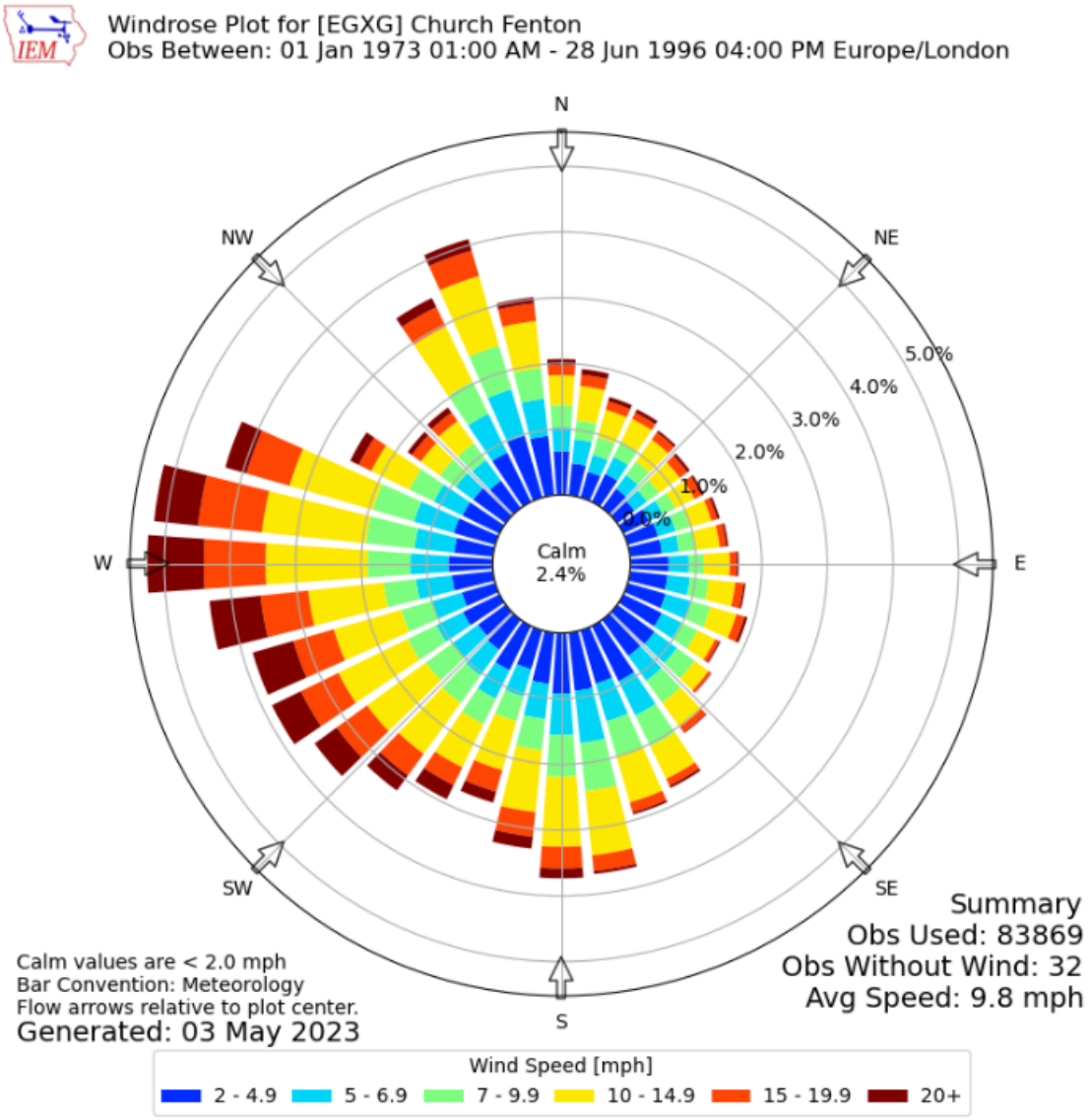


Figure 2.4 - Wind Rose for former RAF Church Fenton

3. PROCESS DESCRIPTION

The proposed AD plant will process up to 100,000 tonnes per annum of feedstock (including manures and slurries, maize, silage, whole crop rye, vegetable waste and potato rejects) from Home Farm and other local farms.

The proposed process includes these key stages:

- *Feedstock Reception and Storage*: Incoming wastes such as manures will be delivered to site and stored within the feedstock reception building. Energy crops and silage will be stored externally within the silage clamps while liquid feedstocks, such as, slurries will be stored in reception tanks:
- *Digestion*: Solid feedstocks are fed to a sealed unit via hoppers, where they are mixed with the liquid feedstocks and recirculated liquids to create a substrate which is pumped into the processing vessels (digesters). Within the digesters, the substrate is mixed and heated to allow the bacteria to break down the organic matter in the absence of oxygen. During digestion, biogas is continuously produced in the vessels, typically around 55% methane and 45% carbon dioxide:
- *Digestate Separation:* Following digestion, the residual digestate material containing indigestible fibre and nutrients is pumped to a separation system, where the solid fraction is separated from the liquid fraction. Solid digestate is then stored in a dedicated segregated Digestate Storage area within the enclosed Separator Building and liquid digestate is stored in the engineered covered digestate lagoon prior to being spread to land as fertiliser at the appropriate time;
- *Biogas Upgrading:* The majority of the biogas produced during the process is upgraded to remove CO2 and convert to pure biomethane. Biomethane is a clean renewable gas that is compliant with the gas grid specifications and regulations. The biomethane is continuously monitored and metered prior to injection into the gas grid;
- *Carbon Dioxide Recovery*: During biogas upgrading, a side stream of clen compressed CO2 is produced. This will be recovered and liquified before being sent offsite to an end user, likely the food and drinks industry;
- *Electricity Production:* Two natural gas generator sets will be utilised to provide electrical power for onsite use; and
- *Biogas Combustion*: A small portion of the gas produced will be combusted in the biogas boiler (560kWth) which will provide heat to the plant during start up and in extremely cold weather situations.

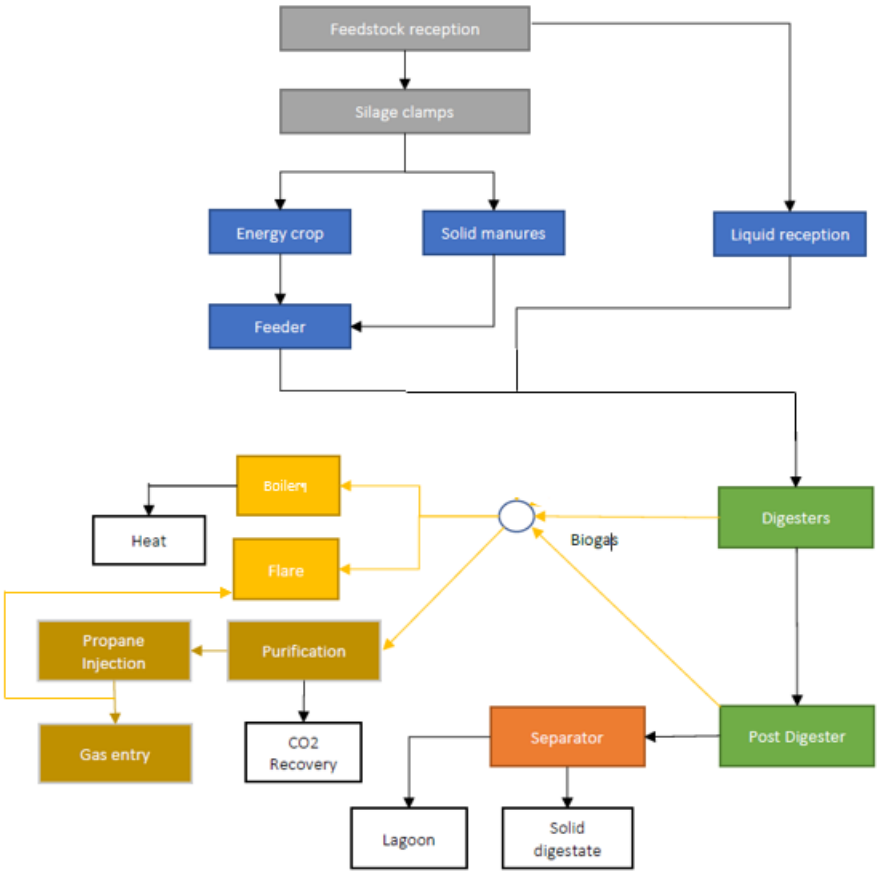


Figure 3.1 - Process Flow Diagram

3.1 Competent Operator

All site activities will be performed by competent and trained individuals who are both suitably qualified and experienced.

All personnel employed on site will be suitably trained and experienced at operating all plant and equipment associated with their particular role; especially with regard to the acceptance and handling (and associated rejection) procedures for odorous materials received on site.

On occasions where these competent and experienced personnel are off work or unable to perform their role, the most suitable replacement will be sourced from the available workforce and any relevant training will be administered before they perform the task.

4. ODOUR SOURCES

The following sections detail the identified odour sources arising from both on-site sources and off-site sources.

4.1 Onsite Odour Sources

4.1.1 Source Materials

The site has been designed to accept and treat a maximum of 100,000 tonnes per annum of feedstocks including non-hazardous agricultural and green wastes.

It is acknowledged that these wastes have the potential to be odorous, and storage times onsite are largely dictated by the process. The site operates with a hierarchy of odour control and abatement measures to ensure that the potential for odour impacts is minimised.

Delivery of material to the site will be via agricultural tractor and trailer loads, HGVs and road tankers, in the case of liquid wastes. All vehicles will be covered or contained to prevent odour emission during transport to site. Waste materials will be unloaded on the external concrete apron and immediately transferred for storage within the Feedstock Reception Building which is fitted with an extraction system to keep the building under negative pressure, and an odour abatement unit, or within designated tanks.

An Odour Impact Assessment has been undertaken, concluding that potential odour impacts from the site on nearby receptors will not be significant. The table below details potentially odorous materials accepted on site:

Table 4.1 - Source Materials

Waste Type	EWC Code	Odour Potential	Quantities and Storage Time[1]
Agricultural and Forestry Wastes	02 01 01 02 01 03 02 01 06 02 01 07 02 01 99	Moderate to High Agricultural and Forestry wastes have variable odour potential, with some (02 01 06) likely having a high odour potential through release of ammonia and hydrogen sulphide.	Up to 638 tonnes in the waste reception building – maximum residence time of 1 month Liquid feedstock tanks up to 60m^3 per tank (2 tanks total) – maximum residence time of 1 week
Food Preparation and Processing Wastes	02 03 01 02 03 04 02 03 05 02 04 01 02 04 03 02 05 01 02 05 02 02 06 01 02 06 03 16 10 02 20 01 25 20 03 02	Moderate to High Food preparation and processing wastes have variable odour potential, with some (02 05 02, 02 06 01) likely having a high odour potential from dairy and bakery effluent treatment. The majority of wastes have a moderate potential for odour with worsening effects if not managed correctly.	Up to 638 tonnes in the waste reception building – maximum residence time of 1 month Liquid feedstock tanks up to 60m^3 per tank (2 tanks total) – maximum residence time of 1 week

Drink Production (alcoholic and non-alcoholic) Wastes	02 07 01 02 07 02 02 07 04 02 07 05	Moderate Wastes from the drinks production industry are considered to have a moderate potential, with the exception of 02 07 05 which may have a high odour potential through its fermented and microbial nature.	Up to 638 tonnes in the waste reception building – maximum residence time of 1 month Liquid feedstock tanks up to 60m^3 per tank (2 tanks total) – maximum residence time of 1 week
Waste Treatment Wastes, including produced digestate	19 02 10 19 06 03 19 06 04 19 06 05 19 06 06 19 08 09 19 08 12	Moderate to High Waste from waste treatment have a moderate to high odour potential from the organic and fermentative process used to in treatment. The waste of the highest potential are 19 06 05 and 19 08 09	Up to 638 tonnes in the waste reception building – maximum residence time of 1 month Liquid feedstock tanks up to 60m^3 per tank (2 tanks total) – maximum residence time of 1 week Sillage Clamps – 25,600 tonnes (spread over 2 clamps)
Green Waste	20 02 01	Moderate The storage of green waste is not likely to arise in significant odour potential, however during the anaerobic digestion process, green waste has the potential to strong, ammonia-like, and musty odours.	Up to 638 tonnes in the waste reception building – maximum residence time of 1 month

[1]Storage times will be kept to a minimum, however these are dictated by the anaerobic digestion process. As a result, storage times will be variable and subject to change to meet process demands

4.1.2 Releases

A number of potential odour releases have been identified. These are outlined below:

- Air exhaust from the waste reception & separator buildings via the odour treatment plant and stack;
- Exposed crops within silage clamps;
- Farmyard Manures (FYM) unloaded on concrete apron prior to transfer;
- FYM stored within the reception building;
- Liquid slurry stored within tanks via a vent;
- Exposed crops and FYM during transfer to the feeder;
- Exposed and agitated material within the feeder hopper;
- Emissions from liquid digestate storage lagoon vents; and
- Emission from road tankers at liquid digestate filling points.

Emissions from storage of solid digestate are considered as part of the air exhaust from the buildings via the odour treatment plant and stack. As the AD process is sealed, this does not form part of the list of odour releases. If releases from this plant are detected, this would indicate a fault and result in immediate remedial measures to address the issue.

4.2 Offsite Odour Sources

There are other potential sources of off-site odour identified that may be relevant to the proposed site. These are identified in the table below:

Table 4.2 - Offsite Odour Sources

Offsite Odour Source	Distance from site	Source Type
Low Farm	Approximately 20m NE	Farm
Low Farm Energy AD Plant	Approximately 20m NE	AD Plant
South Milford Home Farm	Approximately 660m W	Farm
Amur AD Plant	Approximately 520m S	AD Plant
The Maltings Organic Treatment Plant	Approximately 720m S	AD and Composting Facility
Unnamed Farm	Approximately 750m E	Farm

5. CONTROL MEASURES

The site has several measures in place to control odour; all of these are considered in relation with the operations that are undertaken on site on a daily basis.

The site has aligned its environmental management system and operational procedures in accordance with the site environmental permit.

Environmental Management System procedures ensure that good operational practices are employed. Effective management and control of the process minimises odour generation.

The following sections detail management techniques, procedures, and odour control measures to minimise the potential for odour generation from the process.

5.1 Receipt and Management of Potentially Odorous Materials

Due to the nature of the site's activities, there is potential for odour emissions and impacts to arise from the site if waste is not managed effectively.

Upon receipt of odorous material, the site will adhere to its waste acceptance procedures (including pre-acceptance and rejection procedures). All incoming waste will be inspected to ensure they are permitted on site and are conforming loads with the necessary standards.

Delivery of material to the site will be via agricultural tractor and trailer loads, HGVs and road tankers, in the case of liquid wastes. All vehicles will be covered or contained to prevent odour emission during transport to site.

Feedstock delivery of crops will only be undertaken for short periods, with the waste quickly compacted, covered and sealed following deposition in the storage clamps. Odour emissions from these sources are therefore likely to be short in duration and controlled effectively once the relevant materials are contained.

Delivery of FYM will be deposited upon the concrete apron and transferred immediately to the feedstock reception building[1]. Operational controls will ensure that delivery of FYM is typically only when required and transfer into the building will be immediate with a maximum time of 30minutes. Roller shutter doors will be closed when not in use and the building is kept under slight negative pressure to prevent odour release whilst doors are open. Any particularly potentially putrescible wastes are stored within the Feedstock Reception Building.

Meteorological conditions are routinely monitored with transfer and handling of odorous materials limited when potential impact at the nearest sensitive receptors could occur.

Removal of liquid digestate created by the process will be via road tankers. There is potential for short term odour emissions to arise from the displacement of air within the tanker during the filling process. This will be mitigated through use of carbon filters. Solid digestate created by the process will be stored within the reception building before removal from the site via covered bulkers.

[1] Unloading within the building is not practicable, due to the tip loading nature of the delivery vehicles and restrictive height of the building eaves.

A primary odour control measure on site will be the strict adherence to site's EMS and accepting only waste that is outlined in the permit. Following these measures will help to eliminate odorous materials entering site that could cause potential issues, especially if left in storage for any lengthy period of time.

The below waste reception and storage regime will result in a significant reduction in the likely odour potential of waste received at the facility:

- All waste will be subject to pre-acceptance and acceptance procedures;
- Waste will be subject to random spot checks by site staff to ensure odorous materials are covered or contained appropriately;
- Materials with higher odour potential are stored within an enclosed building with extraction and abatement;
- Good housekeeping measures to ensure yard areas and drainage gullies are clear of detritus;
- AD process is fully enclosed within covered vessels;
- Storage of solid digestate internally within enclosed building;
- Storage of liquid wastes in tanks;
- Tank vents connected to abatement within the feedstock building;
- Storage of liquid digestate in covered lagoon;
- Lagoon vents are fitted with carbon filters for odour abatement;
- Covering of external feedstocks;
- Minimisation of handling times during feedstock delivery and transfer (30 minutes maximum for FYM delivered to concrete apron).

5.2 Transfer of Odour to Air

Limited transfer of odour to air could take place during several of the normal operating activities undertaken on site. This will include

- Odour release from delivery of solid feedstock to concrete apron prior to transfer to the Feedstock Reception Building;
- Odour release from the transfer of feedstocks from clamps into the feeder unit;
- Odour release from vents surrounding the digestate lagoon;
- Displacement of air during filling of tanks.

Delivery of feedstocks to the concrete apron is required due to operational logistics. Unloading of the vehicles directly into the feedstock reception building is not possible due to the restricted height of the eaves. As such, initial unloading onto the external concrete apron and then immediate pushing into the building is to be undertaken. It is proposed that that this process takes no longer than 30 minutes, minimising the time spent externally prior to enclosure within the building.

Filling of tankers undertaken at the dedicated point east of the lagoon. It is expected that between 3 loads per day during winter and 23 loads per day over spring/late summer may occur. Displacement of potentially odorous air during tanker filling will be abated through use of a carbon filter.

Although odour release from vents on the liquid slurry tanks has been considered, these will be mitigated by connection to the abatement within the feedstock building.

All of the above odour emission sources have been included within the site Odour Impact Assessment. The OIA concludes that there will be no significant impact at the nearest sensitive receptors from operation of the AD facility.

Mobilisation of odorous chemicals to the air will be minimised through the following control measures:

- Covering of externally stored materials to reduce the rate of evaporation, prevent rain ingress, prevent escape of odorous air and prevent heating through exposure to sunlight.
- Ensuring particularly odorous materials are stored internally within the Feedstock Reception Building;
- Minimisation of handling of externally stored materials, with handling times at the face during delivery and transfer kept to a minimum before resealing with the cover;
- Covering of the liquid digestate lagoon and process tanks/vessels;
- Vents from the liquid feed tanks are connected to the feedstock building ababtement unit;
- Vents from the lagoon are to be abated via carbon filter.

5.3 Containment of Contaminated Air

Storage of wastes will be within the feedstock reception building. Solid digestate will be stored within the Separator Building. Both buildings will be kept under negative pressure to ensure no fugitive emissions when the doors are open. All extracted air within the buildings will be passed through the odour control unit and emitted via the 14 m high odour stack. Please see Section 5.4 for details on the proposed Odour Control Unit.

Feedstocks stored externally are covered, with handling times kept to a minimum.

The digestate lagoon is covered, with vents fitted with appropriate abatement.

All tanks and vessels associated with the process are sealed, preventing emissions from the process itself.

Vents from liquid feed tanks / blending tank are connected to the abatement system of the feedstock building.

5.4 End of Pipe Treatment

The Feedstock Reception Building is fitted with an extraction and odour abatement system. This will effectively treat any odorous emissions from within the building prior to release to atmosphere via a 14m high stack. Emissions from the Separator Building, liquid feedstock tanks and liquid digestate tank are also routed to the odour control unit. Reductions in ammonia will be at a minimum of 97% efficiency and reductions of odour will be at a minimum of 90% efficiency.

Odour Control Unit

The proposed Odour Control Unit has been designed and manufactured by *Centriair*, using their ColdOx™ system. In summary the system utilises a hybrid approach, with an acid scrubbing system combined with a UV and activated carbon system, thereby reducing the requirements for sulphuric acid storage (H_2SO_4 96%) onsite.

It is designed to intake 50,406m^3 per hour. Prior to treatment, it is expected that there will be in excess of 150,000 OU/m^3. Following treatment, it is expected to reduce to less than 1,000 OU/m^3, marking a significant reduction in odorous compounds per unit of air.

The proposed unit is approximately 16m long and 5m wide.

In the Odour Control Unit, the first stage of treatment is within the UV reactor, built together with an active carbon filter. The UV unit has a lamp life of 16000 hours and is primarily used to treat air from the buildings. Active carbon filters with a medium residence time are required due to the initial treatment and the combined effects from oxidation and carbon. Dual carbon beds, along with industrial centrifugal fans, are present to prevent pressure drops within the system. SulphaRed filters with a medium residence time work to remove up to 100% of hydrogen sulphide by converting it to sulphur salt by chemical adsorption.

The NH_3 removal counter current scrubber is operated under acidic conditions to remove ammonia and other alkaline components from the intake gas. This is achieved by adding H_2SO_4 to the washing water. This system is designed to operate 24 hours per day without shutdown, other than for maintenance. The acid scrubbing system will primarily treat air from the reception and digestate storage tanks.

Additionally, biogas produced by the process is subject to upgrading and treatment prior to utilisation within the sites biogas boiler or injection to the grid. The raw gas treatment unit removes emissions such as Carbon Dioxide (CO_2), Hydrogen Sylphide (H_2S) and Particulates. The raw gas treatment unit effectively captures CO_2 from the raw gas and scrubs H_2S and particulate emissions via adsorption methods, activated carbon and particulate filters. H_2S is the only emission in the raw gas profile believed to be potentially odorous.

As such, the onsite biogas boiler will not release any odorous emissions.

5.5 Transport and Dispersion

Transport of potential odour sources around site, i.e. feedstocks and digestate, will be kept to a minimum, with double handling avoided and transfer times kept as low as reasonably practicable. The site will monitor meteorological conditions, including wind speed and direction to enable appropriate planning of transfer activities.

Potential odour emissions from the Feedstock Building will be treated via the odour abatement unit prior to discharge via a 14-meter-high stack. This stack has an exit diameter of 1 meter, and releases at a rate of 23.2m/s. This stack has been designed for optimal dispersion and to minimise odour impact for nearby receptors. Emissions from the Separator Building, liquid feedstock tanks and liquid digestate tank are also routed to the odour control unit. Full details can be found in the Odour Impact Assessment found in Annex A.

5.6 Engaging your Neighbour

If an action is being considered that has the potential to cause temporary odour impacts outside of the normal operational procedures, then the local Environment Agency area team will be informed in advance. Neighbours who may be affected as identified in Section 2.3.2 will be contacted to advise them of the operation being undertaken, and that any increase in odour will be of a temporary nature.

In addition, the site will engage with the local community as often as possible in order to alleviate against negative site perception. The site management shall operate a publicly accessible website, whereby contact information is published such that the public remain informed and are provided with a means of contacting the site if necessary.

In the event of a complaint received from a nearby receptor or stakeholder, Engie will operate in accordance with the complaint's procedure (see Section 5.7 below).

5.7 Response to Complaints

Receipt of an odour complaint during normal operations is treated as an exceedance of control levels. The primary response will be as detailed in accordance with the site's complaints procedure.

A Complaint Report Form will be completed as soon as the complaint is received, as described in Annex B.

An investigation shall be initiated into the cause of the complaint, this will involve as necessary.

- An olfactory survey following the procedure detailed in Section 6.2. The results of the survey will be recorded electronically, a list of information that is recorded electronically is provided within Annex C at the end of this document;
- An examination of the site activities at the time of the complaint;
- An examination of the meteorological conditions at the time of the complaint; and
- A review of the effectiveness of operational and odour control procedures.

If the complaint is validated, it will be treated as an exceedance of the control level. The outcome of the investigation will determine the corrective actions to be implemented (see Section 7).

5.8 Ceasing or Reducing Operations

Following investigations carried out as a result of an odour complaint, consideration will be given to waste acceptance until appropriate measures can be put in place to mitigate any odour impacts.

5.9 Accident Management Plan

The site will maintain a fully functional accident management plan as required by the Environmental Permitting Regulations.

The accident management plan sets out the actions to be taken and measures required to prevent incidents and where an incident occurs the appropriate mitigation action to be taken.

The plan considers the following scenarios:

- Any spillage or leaks;
- Any vandalism;

- Flooding;
- Fire;
- Receiving incompatible waste on site;
- Failure of main services; and
- Failure of major plant and equipment.

Please refer to Section 8 which provides more information on how the site will address any events which could cause odour emissions from site.

6. MONITORING

The company will employ the following monitoring techniques to ensure that the Control Measures (**Section 5**) are maintained, and effective, operational procedures are followed and that good practices are being implemented:

- Site inspections by the Site Manager or delegated personnel;
- Site audits and inspections by the Environmental Agency;
- Site Inspections by the Planning Authority; and
- Third party audits.

6.1 Responsible Persons

Responsible persons are detailed within Annex D. All site personnel are responsible for immediately reporting odour problems to the Site Manager or Managing Director.

6.2 Meteorological Conditions

Meteorological forecasts and conditions shall be monitored to ensure that any potential odour complaints can be fully investigated, and that effective monitoring can be carried out. Meteorological data will be recorded as per Table 6-1 below.

Table 6.1 - Meteorological Monitoring

Monitoring Requirements	Frequency
Observed and recorded description of condition	Recorded Daily
Precipitation	
Wind speed and direction	Recorded continuously
Temperature	

6.3 Olfactory Monitoring

Given the low risk of odour impact, as determined by the Odour Impact Assessment, odour shall be monitored at a frequency of once per day, as directed by the Site Operations. Observations shall be noted electronically and a list of information that is recorded electronically is provided within Annex C at the end of this document. A minimum of 1 survey will be conducted per day, with additional surveys conducted as required and directed by the Site Operations Manager.

Surveys shall be carried out in accordance with the monitoring protocol contained within the Environment Agency's *Technical Guidance Note H4*.

Four locations will be selected to carry out the "sniff test" and these locations will be downwind of the site sources but within the site boundary. Tests carried out at these locations are to confirm that malodour is not detectable at the site boundary.

If odour is detectable at the site boundary, an offsite investigation will be required in the direction of the prevailing wind and closest sensitive receptor. This will also be recorded electronically, a list of information that is recorded electronically is provided within **Annex C** at the end of this document.

The odour assessor must not be subject to significant odour in the 30 minutes prior to the assessment. This survey will be carried out in accordance with the guidance laid out in the *H4 Odour Management Guidance*. This is to ensure that monitors are not suffering from odour fatigue and will be sensitive to site odours.

If any detectable odour is identified at the site boundary and is judged to be moderate (Odour Intensity Rank 3) then the Site Operations Manager will be notified immediately and the olfactory survey will continue to attempt to determine the scope and extent of the odour plume, as follows:

- A suitable location downwind of the site and potentially sensitive receptor at which the odour plume is unlikely to extend will be selected for assessment;
- Survey will continue toward the facility until a site-related odour is perceived; and
- Assessment points perpendicular to the plume axis and equidistant from the site will then be monitored, subject to access requirements.

Monitoring frequencies shall be as detailed in **Table 6.2**

Table 6.2 - Monitoring Frequencies

Parameter	Monitoring Technique	Frequency
Meteorology	See **Table 6.1** for details	
Odour	Olfactory Monitoring	Minimum of once per day, with additional surveys conducted as required. Increased frequency in response to complaints
	External Olfactometry Monitoring	Biannual site odour monitoring by competent third party
	Complaints Monitoring	Continuous
Complaints	Corrective Action Monitoring	Post-implementation of a corrective action

The following scales will be used:

Table 6.3 - Odour Intensity Scale

Score	Intensity
0	No Odour
1	Very Faint Odour
2	Faint Odour
3	Distinct Odour

4	Strong Odour
5	Very Strong Odour
6	Extremely Strong Odour

Table 6.4 - Hedonic Tone Scale

Score	Intensity
+4	Very Pleasant
+3	Pleasant
+2	Moderately Pleasant
+1	Mildly Pleasant
0	Neutral Odour/No Odour
-1	Mildly Unpleasant
-2	Moderately Unpleasant
-3	Unpleasant
-4	Very Unpleasant

6.4 Internal Odour Monitoring

Odour monitoring is conducted at frequencies detailed in **Table 6.2** by a competent person.

The main aim of monitoring will be to test if any odours emitted from the site will be causing the nearest receptors nuisance. In scenarios where nuisance is being caused then operations can be suspended until the conditions improve, also the site operations manager may deem it necessary to find the precise source of the odour and attempt to eliminate it or neutralise it immediately.

6.5 Records

Appropriate records shall be maintained and include the following details:

- Results of inspections and olfactory monitoring carried out by site personnel;
- Meteorological conditions including wind speed and wind direction;
- Operational problems including date, time, duration, prevailing weather conditions and cause of problem;
- Notification to the EA of abnormal/odorous activities on site
- Complaints received including address of complainant (if available);
- Details of corrective action taken, and any subsequent changes to operational procedures; and
- An evaluation of the effectiveness of control and abatement techniques used.

If any samples have to be analysed by laboratory-based olfactometry then the following records must be made:

- Date, time and details of emissions point sampled, and why you chose them;
- How you preserved the samples (holding time and conditions);
- Method of sampling (e.g grab sample);
- The laboratory where the results were analysed, and any certification status;
- Any laboratory observations that might affect how you interpret results;
- Process parameters; and
- Weather conditions.

7. ODOUR MANAGEMENT RISK ASSESSMENT

The following risk assessment, below in **Table 7.1** has been prepared in line with the latest Odour Management guidance, published on 3rd December 2025. It considers the risks relevant for the site, and the sources of the described risks, relevant receptors, pathways from source to receptor, control measures, as well as overall risk ratings.

Table 7.1 - Odour Impacts Risk Assessment

Odour Source	Pathway	Receptor	Risk Rating (before mitigation)	Mitigation Measures	Risk Rating (after mitigation)
Receipt and Storage of Solid Wastes	Airborne	Local Residents businesses and recreational users of the area	Medium	▪ A primary odour control measure on site will be the strict adherence to site's EMS, including waste acceptance and rejection procedures and accepting only waste that is outlined in the permit. Following these measures will help to eliminate odorous materials entering site that could cause potential issues. ▪ All incoming waste will be inspected to ensure they are permitted on site and are conforming loads with the necessary standards. ▪ Delivery of material to the site will be via agricultural tractor and trailer loads and HGVs which will be covered or sealed to prevent odour releases. ▪ Delivery of FYM will be deposited upon the concrete apron and transferred immediately to the feedstock reception building. Roller shutter doors will be closed when not in use and the building is kept under slight negative pressure to prevent odour release whilst doors are open. ▪ Any particularly potentially putrescible wastes are stored within the Feedstock Reception Building. ▪ Solid waste materials with higher odour potential are stored within an enclosed building with extraction and abatement; ▪ Meteorological conditions are routinely monitored with transfer and handling of odorous materials limited when potential impact at the nearest sensitive receptors could occur. ▪ Waste will be subject to random spot checks by site staff to ensure odorous materials are covered or contained appropriately; ▪ AD process is fully enclosed within covered vessels; ▪ Good housekeeping measures to ensure yard areas and drainage gullies are clear of detritus; ▪ Storage of solid digestate internally within enclosed building; ▪ Minimisation of handling times during feedstock delivery and transfer. (FYM on the concrete apron limited to 30minutes maximum).	Low

Receipt and Storage of Liquid Wastes	Airborne via release from vents and displaced air in tanks	Local Residents businesses and recreational users of the area	Medium	▪ A primary odour control measure on site will be the strict adherence to site's EMS, including waste acceptance and rejection procedures and accepting only waste that is outlined in the permit. Following these measures will help to eliminate odorous materials entering site that could cause potential issues. ▪ All incoming waste will be inspected to ensure they are permitted on site and are conforming loads with the necessary standards. ▪ Delivery of material to the site will be via road tankers which will be covered or sealed to prevent odour releases. ▪ All liquid waste will be stored in tanks, and tank vents will be connected to abatement within the feedstock building.	Low
Air exhaust from the waste reception & separator buildings via the odour treatment plant and stack	Airborne via release into atmosphere	Local Residents businesses and recreational users of the area	Medium	▪ The Feedstock Reception Building is fitted with an extraction and odour abatement system. ▪ Any odorous emissions from within the building will be effectively treated prior to release to atmosphere via a 14m high stack. ▪ Emissions from the Separator Building, liquid feedstock tanks and liquid digestate tank are also routed to the odour control unit. Reductions in ammonia will be at a minimum of 97% efficiency and reductions of odour will be at a minimum of 90% efficiency. ▪ Odour value at the stack will be 1000 OU/m^3. ▪ The odour extraction and abatement systems will be well-maintained in-line with the manufacturer's instructions to prevent breakdown or failure. ▪ Only suitable trained operatives will be permitted to operate the extraction and abatement system to prevent accidental damage occurring from improper operation	Low
Exposed crops within silage clamps	Airborne via wind-whipping	Local Residents businesses and recreational users of the area	Medium	▪ Feedstock delivery of crops will only be undertaken for short periods, with the waste quickly compacted, covered and sealed following deposition in the storage clamps. Odour emissions from these sources are therefore likely to be short in duration and controlled effectively once the relevant materials are contained. ▪ All external feedstocks will be covered whilst stored in silage clamps	Low
Exposed crops and FYM during transfer to the feeder, and within the feeder hopper	Airborne via agitation	Local Residents businesses and recreational	Medium	▪ All feedstocks will be minimally handled to prevent odour release via excessive agitation ▪ During transfer to the feeder odour release may happen though will be minimal and for a short duration	Low

		users of the area		▪ Handling of transfer of feedstock to the feeder will be done in accordance with onsite waste and feedstock handling procedures ▪ Only trained site staff will carry out transfer activities to the feeder.	
Emissions from liquid digestate storage lagoon vents	Airborne via release from vents	Local Residents businesses and recreational users of the area	Medium - Low	▪ All liquid digestate will be stored within the onsite covered lagoon. ▪ There are 11 vents from the lagoon. ▪ Each vent is fitted with a carbon filter as appropriate abatement to further odour emissions arising from the venting of gases.	Low
Emission from road tankers at liquid digestate filling points	Airborne via displacement of air	Local Residents businesses and recreational users of the area	Medium-Low	▪ Removal of liquid digestate created by the process will be via road tankers. There is potential for short term odour emissions to arise from the displacement of air within the tanker during the filling process. ▪ During tanker filling, displaced air will be vented via a carbon filter as appropriate abatement to prevent odour	Low
Spills and Material Handling Failures	Airborne via agitation from spill/leak	Site Staff, Local Residents businesses and recreational users of the area	Low	▪ All infrastructure will be constructed in line with the relevant standards to prevent accidental spills or leakages of odorous material. ▪ All storage areas are located upon impermeable hardstanding with sealed drainage systems. ▪ Any and all spills or leakages will be cleaned up immediately upon detection to prevent any undue odour release to air ▪ Appropriate guidance for storage, such as CIRIA 736, is followed on site to minimise the risk of leakages or loss of containment ▪ All operational staff will be trained in the safe handling of odorous materials in relation to their specific role to prevent spillages arising from operational error ▪ Tanks will be inspected visually on a daily basis by the site staff to ensure the continued integrity of the tanks and identify the requirement for any remedial action. The site manager will be ultimately responsible for ensuring monitoring, inspections and where applicable, maintenance, is carried out. ▪ The site EMS includes a Spill Response Procedure and spill kits are located and maintained at strategic locations around site.	Low

Plant or Equipment Failure	Airborne via failure of containment within process or associated abatement	Local Residents businesses and recreational users of the area	Medium	▪ Plant or equipment failures (e.g. odour abatement plant, transfer vehicles) have the potential for significant release of odour, although the likelihood of the plant/equipment failing remains low ▪ All plant and equipment are subject to the Inspection, Maintenance and Repair programme implemented on site designed to minimise the risk of plant/equipment failing ▪ All plant and equipment is maintained in accordance with the manufacturer's instructions ▪ Only site staff are permitted to operate plant and equipment to the level they have been trained at. No unauthorised operation of plant or equipment will be undertaken on site ▪ All plant and equipment will be constructed to the relevant standards to prevent breakdown or failure, and therefore the release of odour. ▪ Should plant or equipment fail, and the risk of significant odour releases arise, secondary control measures appropriate to the failure will be implemented. This may include ceasing operations or the acceptance of new material until repairs are made.	Low
Vandalism	Airborne via agitation, fire, or plant damage/destruction	Local Residents businesses and recreational users of the area	Low	▪ The site will have a CCTV monitoring system ▪ The site will be secured by a 2.4m high steel paladin-type perimeter fence. ▪ Motion detecting security lighting will be in operation across the site ▪ Fencing will be maintained and repaired to ensure its continued integrity. If damage is sustained, repair will be made within the same working day. If this is not possible, suitable measures will be taken to prevent unauthorised access to the site and permanent repairs will be affected as soon as is practicable. ▪ All visitors to the site are required to register in the visitor's book and sign out again on exit, thereby minimising the risk of unauthorised visitors on the site.	Low

8. COMPLIANCE ACTION PLANS

8.1 Control and Trigger Levels

Control and Trigger levels are presented below in

Table 8.1 - Control and Trigger Levels

Parameter	Monitoring Technique	Control Levels
Odour	Routine Olfactory Monitoring	Odour Intensity ⩾3 recorded at any monitoring location (persistent / transient nature noted and considered)
	Complaints Monitoring	Receipt of complaint

8.2 Compliance Actions

A recording of Odour Intensity ≥3 during routine olfactory monitoring or the receipt of a complaint will necessitate further investigation into the causes and indicate whether further monitoring is required. Actions to be taken in the event of an exceedance will be dictated by the nature and extent of the exceedance(s) (e.g., by considering the magnitude of exceedance and whether it was event driven or on-going).

8.3 Detection of Moderate Odour During Olfactory Surveys

Detection of a moderate odour, (i.e., 'odour easily detected while walking and breathing normally, possibly malodorous), will initiate a more extensive olfactory survey to determine the extent of the odour plume (as described in Section 6.3). An investigation will be initiated into the cause of the odour. This shall involve as necessary:

- A review of the site activities at the time of the olfactory survey;
- A review of the meteorological conditions at the time of the olfactory survey; and
- A review of the effectiveness of process operations and odour control procedures.

8.4 Corrective Actions

The outcome of an investigation will determine the corrective actions to be implemented. The following corrective actions will considered, but not be limited to:

- Alteration to waste reception procedures and odour control measures employed;
- Review of all processes on site; and
- Update of OMP if new procedures are created.

Extent of the corrective actions undertaken will be decided by the competent site operations manager, as per their responsibility of implementing this odour management plan.

8.5 Reporting

Exceedance of a control level will be investigated (as described above) and recorded. This includes recording the following:

- Nature of the incident;
- Date of occurrence(s);
- Results of the investigation;
- Details of responses / action plans implemented;
- The event will be marked within the site's incident log; and
- The report of any exceedance will be made available to the Environment Agency on a quarterly basis.

9. INCIDENTS AND EMERGENCIES

Consideration has been given to the types of failure or abnormal events that have the potential to result in an odour impact. Abnormal events include the following:

- Power outage or electrical supply fault
- Breakdown of plant resulting in potential backlog of waste;
- Breakdown of plant resulting in failure of air extraction system; and
- Fire and Explosion.
- Road Closures

Failure and abnormal event scenarios are summarised below.

Power Outage or electrical supply outage

Power to the site is provided by two onsite natural gas generator sets. In the event of a power outage, an emergency diesel generator is available to provide power to critical systems until genset power is restored.

In the unlikely event this were to occur, short-term odour impacts may be experienced through loss of the odour control unit in the reception building.

Breakdown of plant resulting in potential backlog of waste

A supply of critical spares will be maintained onsite. The site will employ skilled fitters / contractors to promptly repair any faults.

All plant and equipment will be maintained and regularly serviced in accordance with the manufacturer's recommendations and planned maintenance procedures to minimise breakdowns.

In the event that repairs cannot be promptly carried out relevant activities will be suspended where there is an increased risk of odour emissions or offsite impact.

If necessary, the facility will remain closed to further deliveries of waste until the plant is restored and any backlog cleared.

Breakdown of plant resulting in failure of extraction and abatement system

Receipt of potentially odorous or putrescible feedstock material will cease.

All stored feedstock from the feedstock reception building will be processed as quickly as possible and no additional waste will be stored in the feedstock reception building.

All plant and equipment will be maintained and regularly serviced in accordance with the manufacturer's recommendations and planned maintenance procedures to minimise breakdowns.

If necessary, the facility will remain closed to further deliveries of waste feedstock until the plant is restored and the backlog is cleared.

Fire and Explosion

Fire and explosion risk procedures will be adopted onsite. If required following a fire or explosion, operations will cease in the affected area until all plant and infrastructure are restored.

The site will operate a full evacuation plan in the event of a fire or explosion, and the relevant authorities and will be informed at the earliest opportunity.

Following a fire, all plant would be inspected, replaced and repairs implemented as necessary. Further waste receipt would be suspended until normal operation is restored.

Road Closures

In the event that the A162 is closed, the site will be unable to received additional feedstock. Operations will continue as normal for the site, and the road closure team will be consulted about provisions for access to and from the site during road closure times.

Given the local significance of this highway, extensive road closures are very unlikely and impacts from road closures are expected to be minimal.

9.2 Abnormal Meteorological Conditions

Although it is accepted that a number of meteorological conditions can exist that promote the generation of odour and may inhibit its effective dispersion (i.e. high temperatures and still conditions) such scenarios are not considered to have the potential to impact the facility and surrounding receptors.

The facility will monitor and record all meteorological conditions and make suitable planning arrangements to ensure that any major maintenance activities are carried out in favourable meteorological conditions to reduce the potential for impact

10. INSPECTION, MAINTENANCE AND REPAIRS.

The site, including all of its infrastructure, plant and equipment, will be subject to the site's Inspection , Maintenance and Repair programme. The programme will fulfil all of its duties when reviewing onsite infrastructure including water containment facilities, abatement systems, treatment plant and equipment as well as site surfacing.

This programme will be in place, in part, to prevent unplanned odour releases for plat failure or breakdown before it occurs by regularly inspecting, maintaining and repairing (where necessary) all plant, equipment and infrastructure showing signs of damage or degradation. These will include:

- Process equipment, including AD digestors and feeders;
- Monitoring instruments;
- Ventilation systems, including the onsite extraction and abatement system;
- Buildings, including the Feedstock Reception Building and Separator Building;
- Infrastructure such as the silage clamps; and
- Containment features, including all tanks and bunds.

The site will undergo daily inspections once operational to ensure signs of damage or degradation are detected as early as possible, so repairs can be made before failure occurs.

All plant and equipment will be maintained, serviced, and repaired in line with the manufacturer's instructions.

If significant repairs or maintenance is required, appropriate secondary control measures will be sought to prevent significant odour release. This may include ceasing operations or the acceptance of further waste on site. Secondary control measures will be determined on a case-by-case basis.

A full record of inspections, maintenance and repair activities will be kept on site.

APPENDIX A ODOUR IMPACT ASSESSMENT

APPENDIX B ODOUR COMPLAINTS FORM

ODOUR COMPLAINT REPORT FORM	
Time and date of complaint:	
Name and address of complainant:	
Telephone number of complainant:	

Date of odour:	
Time of odour:	
Location of odour, if not at above address:	
Weather conditions (i.e., dry, rain, fog, snow):	
Temperature (very warm, warm, mild, cold or degrees if known):	
Wind strength (none, light, steady, strong, gusting):	
Wind direction (e.g. from NE):	
Complainant's description of odour: What does it smell like?	
Intensity (see Reference Table 1):	
Duration (time):	
Constant or intermittent in this period:	
Does the complainant have any other comments about the odour?	
Are there any other complaints relating to the installation, or to that location? (either previously or relating to the same exposure):	
Any other relevant information:	
Do you accept that odour likely to be from your activities?	
What was happening on site at the time the odour occurred?	
Operating conditions at time the odour occurred (e.g. flow rate, pressure at inlet and pressure at outlet):	

Actions taken:

Form completed by:	Date:	Signed;

Odour Intensity	Description
1	No detectable odour
2	Faint odour (barely detectable, need to stand still and inhale facing into wind.
3	Moderate odour (odour easily detectable while walking and breathing normally, possibly offensive)
4	Strong odour (bearable, but offensive odour – will my clothes hair/smell?)
5	Very strong odour (malodorous)

APPENDIX C ODOUR REPORTING FORM

ODOUR REPORTING FORM					
Name of Assessor:					
Confirm Compliance with Reference Table 1:					
Survey Timings	Date				
	Start Time				
	Finish				
Location of Sniff Test :					
Weather Conditions (dry, rain, fog, snow etc)					
Wind Direction (e.g from the SW)					
Wind Strength (none, light, steady, strong, gusting)					
Cloud Cover (%)					
Temperature (°C)					
Precipitation					
Location [1]	Odour Intensity [2]	Odour Extent [3]	Odour Description [4]	Receptor Sensitivity [5]	

<u>Sketch</u>

Provide a sketch of test and source locations

[1]What site boundary points / sensitive receptor?
[2]Refer to Reference Table 2
[3]Refer to Reference Table 3
[4]Describe the character of the odour (e.g. rotten eggs, musty, earthy, drains etc)
[5]Refer to Reference Table 5

Notes;

If odour intensity is judged as 3 or above at any external location within the site boundary the Site Manager must be immediately notified

The extent of the plume should be investigated as follows:

Four suitable locations downwind of the biofilter beds / drying plant but internal to the site boundary will be chosen to clarify that the impact is not detectable at the site boundary and able to create an offsite impact.

In the event that the odour is detectable at the site boundary, an offsite investigation will be required in the direction of the prevailing wind and closest sensitive receptor. Continue toward the site until a faint odour is detectable.

Select further assessment points at right angles to the plume axis and equidistant from the facility to determine extent of plume.

REFERENCE TABLE 1	
Requirements for Assessor	
Assessor has not been exposed to waste related odours for previous 30 minutes	
Assessor has not smoked or consumed strongly flavoured food or drink in previous 30 minutes	
Scented toiletries should not be applied immediately before or during assessment.	
Vehicle used for assessment should not contain deodoriser and care should be taken concerning odour in windscreen wash.	
Reference Table 2	
Odour Intensity	Description
1	No detectable odour
2	Faint odour (barely detectable, need to stand still and inhale facing into wind.
3	Moderate odour (odour easily detectable while walking and breathing normally, possibly offensive)
4	Strong odour (bearable, but offensive odour – will my clothes hair/smell?)
5	Very strong odour (malodorous)
Reference Table 3	
Odour Extent	Description
1	Local and transient (only detected during brief periods when wind drops or blows)
2	Transient as above, but detected away from site boundary
3	Persistent but fairly localised
4	Persistent and pervasive up to 50m from site boundary
5	Persistent and widespread (odour detected > 50m from site boundary
Reference Table 4	
Receptor Sensitivity	Description
1	Low (e.g. footpath, road)
2	Medium (e.g. industrial or commercial workplaces)
3	High (e.g. housing, pub/hotel etc)

APPENDIX D RESPONSIBLE PERSONS

Control Measure	Responsible Persons	
	Implementation on-site	Overall Manager
Receipt and Management of Odourous Materials In accordance with Section 3.1.		
Engaging your Neighbours In accordance with Section 3.6.		
Response to Complaints In accordance with Section 3.7.		
Meteorological Conditions In accordance with Section 4.2		
Olfactory Monitoring In accordance with Section 4.3		
Internal Odour Monitoring In accordance with Section 4.4		
Further Monitoring In accordance with Section 4.5.		
Record Keeping In accordance with Section 4.6.		
Complaint and Corrective Action Monitoring In accordance with Section 5.		

APPENDIX E ODOUR CONTROL UNIT TECHNICAL DETAILS

Quotation no:	1741	Valid through:	2025-12-31	Customer:	Engie UK
Date	2025-12-01	Our ref:	Emanuel Andersson	Your ref:	Phil Morris

Budget Quotation for Odour removal

Centriair develops and offers technology leading solutions for abatement of industrial airborne emissions. We provide solutions with proven environmental and economic benefits. Our systems typically have higher performance and lower energy consumption than prevailing solutions. We help the industry solve a broad range of emission problems while increasing the productivity and reducing operations and maintenance costs.

These benefits are achieved through higher performance, lower energy consumption and by recovering energy from the process. We work across a broad range of industry sectors, however most of our customers are in the food processing and waste processing industries.

Centriair AB
Ögärdesvägen 4A
433 30 Partille
Tel. 46 (0)31 263500
E-mail info@centriair.com
Reg. number 556737-9374

Introduction

Centriair is pleased to offer this quotation for odour removal at the client site based on the ColdOx™ system.

The following design is suggested to be designed for the application. The outlet gas will meet the following criteria:

- Odour concentration less than 1 000 OU/m3 from the chimney.

No	Component	Power Installed/Normal operation	Material
1	Sulphared Compact 1500 + support fan – treating 1 500 m3/h.	1,1/ 0,7 kW	Stainless steel AISI 316L
1	NH3 Scrubber + support fan - treating 13 470 m3/h	7,5/5,4 kW	GRP
2	UV reactor of model Frej with 10 lamp frames – treating 50 406 m3/h	16/15,0 kW per reactor	Reactor, lamp frames, stainless steel AISI 304 Control panel, ballast cabinets stainless steel AISI 304. C4 corrosion protection level.
2	Carbon filter 2x8 - treating 50 406 m3/h		Stainless steel AISI 304
1	Main fan. IP54 - treating 103 670	30/21,0 kW	Stainless steel AISI 304
1	Piping between equipment		
1	Drainpipes with water trap		
1	Instrumentation for control and monitoring		

Centriair AB
Ögärdesvägen 4A
433 30 Partille
Tel. 46 (0)31 263500
E-mail info@centriair.com
Reg. number 556737-9374

Process description

Expected inlet odour concentration values

Before Sulphared	
< 150 000 OU/m3	
Before NH3 Scrubber	
< 24 000 OU/m3	
< 100 ppm NH3	
Before ColdOx	
< 11 000 OU/m3	
< 5 ppm NH3	
	Outlet ColdOx
	< 1 000 OU/m3

Process description:	
Process gas flow:	50 406 m3/h
Process temperature:	< 40 °C
Pressure drop from customer plant:	500 Pa in total assumed for before and after Centriair system
Atex Zone:	None. Centriair equipment is not designed to operate in ATEX zones.

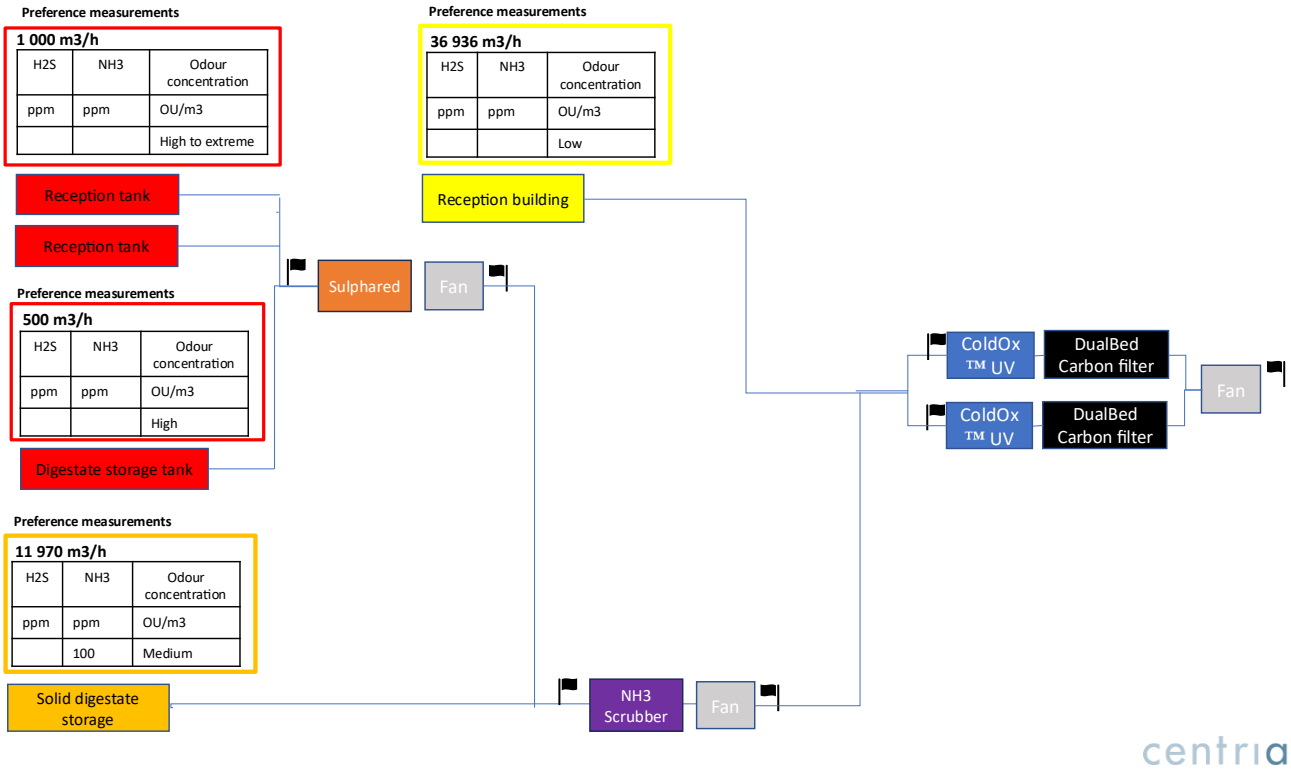
The odour treatment is described according to the feedstock plan (see appendix D) provided by the

In order to maintain a guaranteed performance below 1 000 OU/m3, the odour treatment is designed for the substrates and processes for the current installation. Hence, if the quantity or type of substrate is changed fundamentally from the existing plan, Centriair should be consulted to ensure that the system can maintain the guaranteed level 1 000 OU/m3.

Centriair AB
Ögärdesvägen 4A
433 30 Partille
Tel. 46 (0)31 263500
E-mail info@centriair.com
Reg. number 556737-9374

Odour mapping & Conceptual design

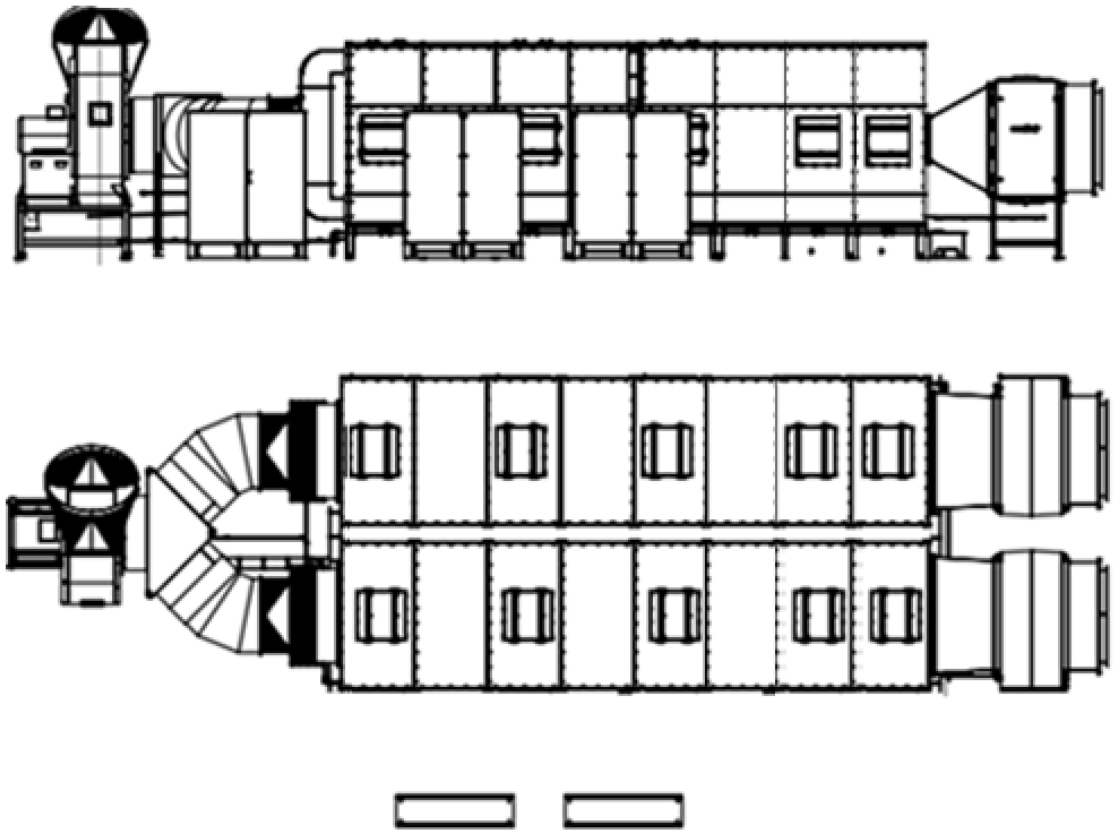
Below is the odour mapping and conceptual design for the odour treatment system.



Centriair AB
Ögärdesvägen 4A
433 30 Partille
Tel. 46 (0)31 263500
E-mail info@centriair.com
Reg. number 556737-9374

Overall footprint

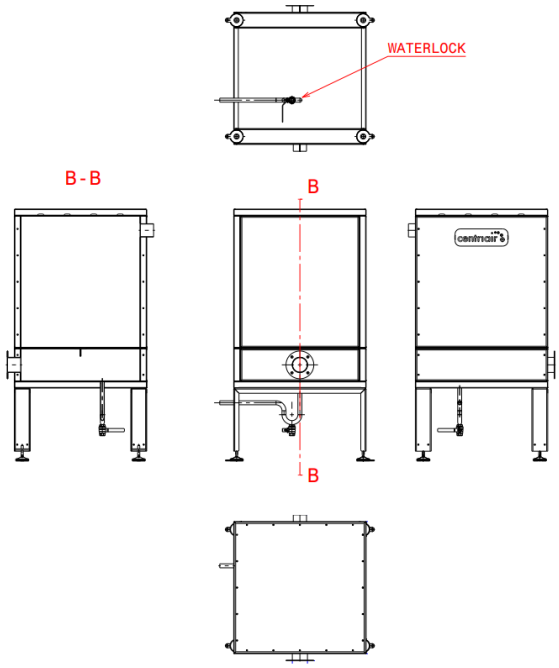
ColdOx™-system – treating 50 406 m3/h:
The proposed ColdOx™-system's footprint is preliminary 16 meters long. The width is 5 meters. Please note that a width of minimum of 8 meters is space necessary for service operations and the height is 3 meters. See an example of a similar layout below.



.

Centriair AB
Ögärdesvägen 4A
433 30 Partille
Tel. 46 (0)31 263500
E-mail info@centriair.com
Reg. number 556737-9374

Sulphared Compact 1 500 – treating 1 500 m3/h:
The Sulphared compact 1 500's footprint is approx. 1,5 meter long. The width is a minimum of 1,5 meter, please note that 2 meters width is necessary for service operations, and the height is 2,0 meters.



NH3 Counter Current Scrubber 13 470 m3/h:
The proposed acid scrubber's footprint: Diameter: 1,3 m, and height: 6,0 m.

Centriair AB
Ögärdesvägen 4A
433 30 Partille
Tel. 46 (0)31 263500
E-mail info@centriair.com
Reg. number 556737-9374

Detailed system specification

UV Specification:

Description :	The UV reactor is the first treatment stage, built together with the active carbon filter. Lamp life is approximately 16 000 hours. Basic control setup is start/stop signal from your system and running and error signal back to your system. Control and safety solution includes pressure guard for the UV as well as door switches. Equipment prewired with “plug and play” to minimize site wiring. Automatic flushing system of lamps, CIP (Clean in Place). Safety switches with alarm system in case of lamp failure. Controls and signaling see Appendix D.
Note:	The ballast panel should be positioned within 10 meter cable length from the UV reactor.
Electrical connection:	380-400 V/50 A three phase + Neutral 50 Hz
Weight:	Total weight of one reactor including support and lamp frames is 580 kg.
Process gas flow:	50 406 m^3/h
Maximal operating temp:	40 °C.
Control system:	PLC Siemens S7 1200

Active Carbon Specification:

Description:	Active Carbon filter with medium residence time due to the initial treatment and combination effects from oxidation + carbon. Dual carbon beds to minimize pressure drop.
Material:	Stainless steel AISI 304
Disposal of Carbon	For the disposal of spent media, we recommend following the guidelines of the European Waste Catalogue EWC and use the waste code number 19 09 04 or 15 02 03 – non hazard waste. Numerous landfills containing household trash and building materials will accept the loaded gas purification product, which is totally harmless to the environment, after submitting a declaration of analysis.
Other:	Centriair has the right to decide which type of activated carbon that operates.

Centriair AB
Ögärdesvägen 4A
433 30 Partille
Tel. 46 (0)31 263500
E-mail info@centriair.com
Reg. number 556737-9374

Fan Specification:

Description:	Industrial centrifugal fans from stainless steel driven by frequency inverter. Fans come with VFD system to regulate the airflow changes. The fan is designed assuming 500 Pa pressure drop in the ducts before and after the ColdOx® System (total 500 Pa). The exact pressure drops in the ducts to our system must be specified before ordering the final fan. This will have to be done already at the detailed design stage. Please revert if additional pressure capacity is needed.
Electrical connection:	380-400 V

SulphaRed Specification:

Description:	SulphaRed filter with medium residence time Dual carbon beds to minimize pressure drop.
SulphaRed volume:	1 500 kg
Pressure drop:	< 100 Pa
Dimensions:	1 500 x 1 500 x 2 000 mm
Material:	Stainless steel 316L

Centriair AB
Ögärdesvägen 4A
433 30 Partille
Tel. 46 (0)31 263500
E-mail info@centriair.com
Reg. number 556737-9374

NH3 Scrubber:

Description: NH3 removal counter current scrubber is operated at an acidic pH-value by adding H2SO4 to the washing water in order to remove ammonia and other alkaline components. The system is designed for a 24 h/day operation without shut down besides maintenance.

Including:

- Scrubber made from GRP
- Packing material
- Droplet separator
- Recirculation pump
- Circulation pipe incl. spraying nozzles
- Pressure gauge
- Level control for the pump sump
- Dry-run protection for the pump
- Heater for the sump
- Automatic blow down with
- Conductivity measurement
- In- and outlet flange for exhaust air.
- Control cabinet

Doing station – Dosing of acid (H2SO4 96%) equipped with:

- Dosing cabinet
- Dosing pump
- Suction and dosing line
- pH probe
- Measuring and control devices
- Leakage sensor

Excluded:

- Chemicals and storage tanks

Centriair AB
Ögärdesvägen 4A
433 30 Partille
Tel. 46 (0)31 263500
E-mail info@centriair.com
Reg. number 556737-9374

Appendix A: Scope of Delivery

Project delivery Scope of Scandinavian Centriair System (Sup = Supplier, Pur = Purchaser	Centriair Scope	
Equipment	Included	Excluded
ColdOx UV	☑	☐
Media	☑	☐
Lamps	☑	☐
Carbon Filter	☑	☐
Main fan	☑	☐
Skid and railings	☐	☑
Chimney	☐	☑
Critical Spare Parts	☑	☑
Heat Tracing	☑	☐
Local certifications for works	☐	☑
Sulphared Compact 1 500 + support fan	☑	☐
Option: Service dampers	☐	☑
NH3 Scrubber + support fan	☑	☐
Drain box for Coldox System	☑	☐
Spent CIP water connection to owner utility	☐	☑
Option: Ducting design	☐	☑
VFD cabinets	☑	☐
Electrical Wiring & Installation		
Cables between Centriair system components (max 10 meters)	☑	☐
Fieldbus connection to the main control panels	☐	☑
Electrical feed to Centriair Control Cabinets	☐	☑
Ducting		
Connection between Centriair components	☑	☐
Connections beyond Centriair components	☐	☑
Foundation		
Structural reinforcements	☐	☑
Water Supply	☐	☑
Drain	☐	☑

Centriair AB
Ögärdesvägen 4A
433 30 Partille
Tel. 46 (0)31 263500
E-mail info@centriair.com
Reg. number 556737-9374

Project delivery Scope of Scandinavian Centriair System (Sup = Supplier, Pur = Purchaser	Centriair Scope	
Transportation	Included	Excluded
Transportation FCA, as specified in quote	☑	☐
Off-loading from incoming transport and storage on site.	☐	☑
Import tarrifs and customs duties - Not applicable	☐	☑
Installation		
Electricity, heating and light supplies during installation	☐	☑
Lifting gear with operator for the installation of the system.	☐	☑
Storage on site prior to installation	☐	☑
Local certification of our engineers to perform works on site - Not applicable	☐	☑
Other items		
ATEX Classification	☐	☑
All local permits, certification for installation team - Not applicable	☐	☑
Bank Guarantee costs	☐	☑
Travel & accommodation costs for work	☑	☐
Odour measurements	☐	☑
Additional items not specified in the proposal	☐	☑

Centriair AB
Ögärdesvägen 4A
433 30 Partille
Tel. 46 (0)31 263500
E-mail info@centriair.com
Reg. number 556737-9374

Appendix B: Standard documentation

Document
P&ID
Instrument list
Valve List
Motor List
Cause and effect matrix (Loop List and Interlocks)
Technical specifications (Fan etc)
Interface list
Instrument Equipment Specification (datasheets)
General arrangement drawing (PDF)
Footprint and load and inteface Drawing
Spare part List
Circuit diagrams
Power consumption list
Cabin Arrangement drawings
Signal list (Alarms etc)
Declaration of conformity
Operation and Maintenance documentation
Take over protocol (Signed with ev punches)

Centriair AB
Ögärdesvägen 4A
433 30 Partille
Tel. 46 (0)31 263500
E-mail info@centriair.com
Reg. number 556737-9374

Appendix C: Standard Communication & Signal Interface

Doc. Type List
Doc. Name Fielbus communication

Centriair					Client			
Siemens					**XXX**			
s7-1200					XX-xxxx			
Modbus TCP server				RD=READ	Modbus TCP client			
192.168.24.11/24				WR=WRITE				
				Modbus TCP				
Address	**Type**	**Function**	**comment.**	**Signal**	**Type**	**Function**	**comment.**
1.0	Bit	System ready	1=OK	--> RD	Bit	System ready	1=OK
1.1	Bit	System running	1= running	--> RD	Bit	System running	1= running
1.2	Bit	RemoteControl	1= remote active	--> RD	Bit	RemoteControl	1= remote active
1.3	Bit	Reset alarm	pos edge	<-- WR	Bit	Reset alarm	1=reset
1.4	Bit	Start	pos edge	<-- WR	Bit	Start	1=start
1.5	Bit	Stop	pos edge	<-- WR	Bit	Stop	1=stop
1.6	Bit	com watchdog	Set bit	<-->RD/WR	Bit	com watchdog	reset bit
1.7	Bit	A-alarm active	0=OK	--> RD	Bit	A-alarm active	0=OK
1.8	Bit	B-alarm active	0=OK	--> RD	Bit	B-alarm active	0=OK
1.9	Bit			SPARE			
1.10	Bit			SPARE			
1.11	Bit			SPARE			
1.12	Bit			SPARE			
1.13	Bit			SPARE			
1.14	Bit			SPARE			
1.15	Bit			SPARE			
2	WORD	spare1	Project specific	--> RD	WORD	spare1	Project specific
3	WORD	spare2	Project specific	--> RD	WORD	spare2	Project specific
4	WORD	spare3	Project specific	--> RD	WORD	spare3	Project specific
5	WORD	spare4	Project specific	--> RD	WORD	spare4	Project specific
6	WORD	spare5	Project specific	--> RD	WORD	spare5	Project specific
7	WORD	spare6	Project specific	--> RD	WORD	spare6	Project specific
8	WORD	spare7	Project specific	--> RD	WORD	spare7	Project specific

Centriair AB
Ögärdesvägen 4A
433 30 Partille
Tel. 46 (0)31 263500
E-mail info@centriair.com
Reg. number 556737-9374

Appendix D: Feedstock plan

Culture_Corn_Silage	**12 080**	16
Culture_Rye_Silage	**13 750**	18
Animal dejections_Chicken_Manure	**7 500**	10
Animal dejections_Cattle_Manure	**4 000**	6
Animal dejections_Pig_Manure	**5 100**	7
Fruit & Vegetable & derivatives _Potato_Vegetable	**6 000**	8
Animal dejections_Cattle_Slurry	**5 000**	7
Animal dejections_Horse_Manure	**4 000**	5
Fruit & Vegetable & derivatives _Sugar Beet_PulpMash	**0**	
Bakery waste__Bread	**0**	
Cereale & processed Crops _Rapeseed_Presscake	**0**	
Dairy waste__Whey_diluted	**1500**	2
Dairy waste__Whey_concentrated	**6000**	8
Fruit & Vegetable & derivatives _Mixed Vegetable_Vegetable	**3000**	4
Culture residues & Green Waste_Sugar beet_Pulpmash_pressed		
	67 930	91

Centriair AB
Ögärdesvägen 4A
433 30 Partille
Tel. 46 (0)31 263500
E-mail info@centriair.com
Reg. number 556737-9374

Appendix E: Overall consumption

The information about the consumption is conservative.

Water consumption UV reactor

The CIP from the UV reactors: (2)*22 l/day = 44 l/day

Consumables ColdOx system & Sulphared

Maintenance work	Quantity	Type	Interval (months)	TOTAL GBP	Total per year GBP
Carbon Filter					
Change of carbon	10 000	[kg]	~ 18-24	35 200	17 600
UV lamps					
Replacement of lamps	200	[pcs]	~ 24	13 200	6 600
Sulphared					
Change of Sulphared	1 500	[kg]	~ 12-18	3 900	2 600

** Please note that the carbon & Sulphared life time is only an estimate, calculated based on previous experience.*

Water consumption Packed NH3 Scrubber

The water consumption assuming 13 470 m3/h @ 100 ppm NH3 24 hours each day drift hours. 10% blowdown concentration.

NH3 Scrubber: 38 L/hour + Evap. losses

Consumables Packed NH3 Scrubber

The sulphuric acid consumption assuming 13 470 m3/h @ 100 ppm NH3 24 hours each day drift hours. 96% acid concentration.

Type	l/h			
96% Acid	1,67			

Centriair AB
Ögärdesvägen 4A
433 30 Partille
Tel. 46 (0)31 263500
E-mail info@centriair.com
Reg. number 556737-9374