GP Biotec Ltd

Great Porthamel, Talgarth,

LD3 0DL

Odour Management Plan

(OMP)

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Contents

1 Introduction

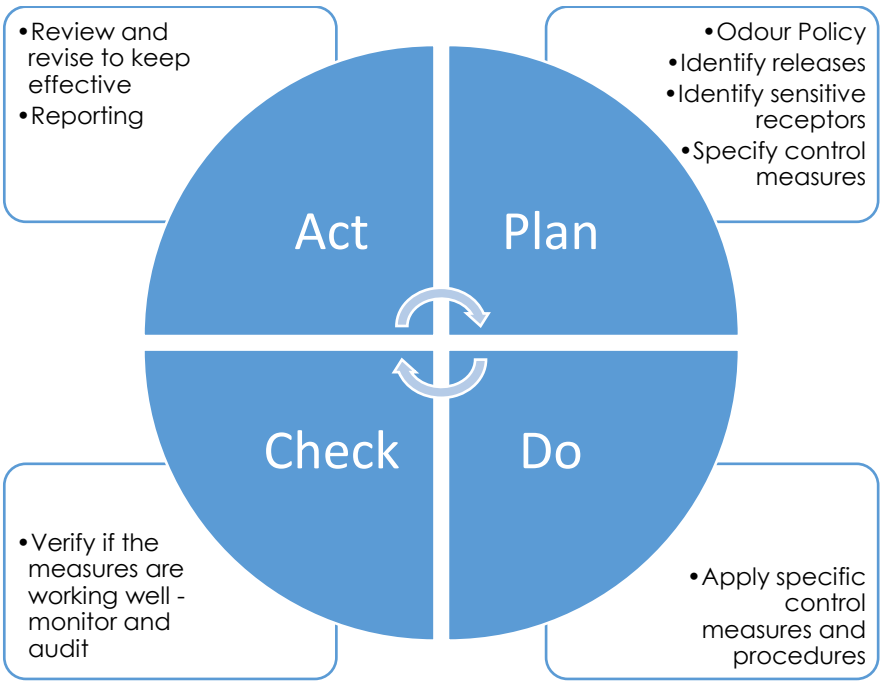
This document provides an overview of the potential odour impacts from activities associated with the anaerobic digestion process at GP Biotec, and the current odour management systems in place. The purpose of the Odour Management Plan (OMP) is to consider the relevant activities that may contribute to the arising and migration of odours at the GP Biotec site, and to detail the remedial/precautionary actions that may be required. The document also gives the details of the current infrastructure, procedures and general practices involving odour detected at the site.

The OMP has been produced in accordance with Environment Agency H4 Odour *Management How to Comply with your environmental permit* and General Monitoring procedures detailed in Environment Agency guidance document Internal Guidance for *the Regulation of Odour at Waste Management Facilities*. This OMP also now incorporates the requirements specified within BAT Conclusions of the Waste Treatment BREF Document (see section 7.4.1).

The OMP has factored in odour monitoring procedures in line with best available techniques and form's part of the Site's Environmental Management System. The procedures and record keeping methods/locations related to odour management are in Annex II of this document.

The OMP follows basic management system principles: Plan, Do, Check and Act, as illustrated below, whilst meeting the Environment Agency's and NRW's general requirements for OMPs as described in their Technical Guidance Note H4.

Figure 1.1 - OMP Cycle



2 Odour Policy Statement

The GP Biotec OMP policy statement is as follows:

- To seek continual improvements in environmental performance.
- To prevent the generation of odour where possible
- To contain the odour and use effective treatment techniques, or other means of minimising emissions, where prevention is not possible.
- To keep exposure to odour at sensitive receptors below the level at which it would give reasonable cause for annoyance.
- To promote the use of good practices for the control of odour, including adequate maintenance and cleaning, storage, containment etc; and
- To limit site activities under exceptional circumstances where odour cannot be controlled, i.e., major abatement plant stoppages, equipment failure etc.

3 Site Overview

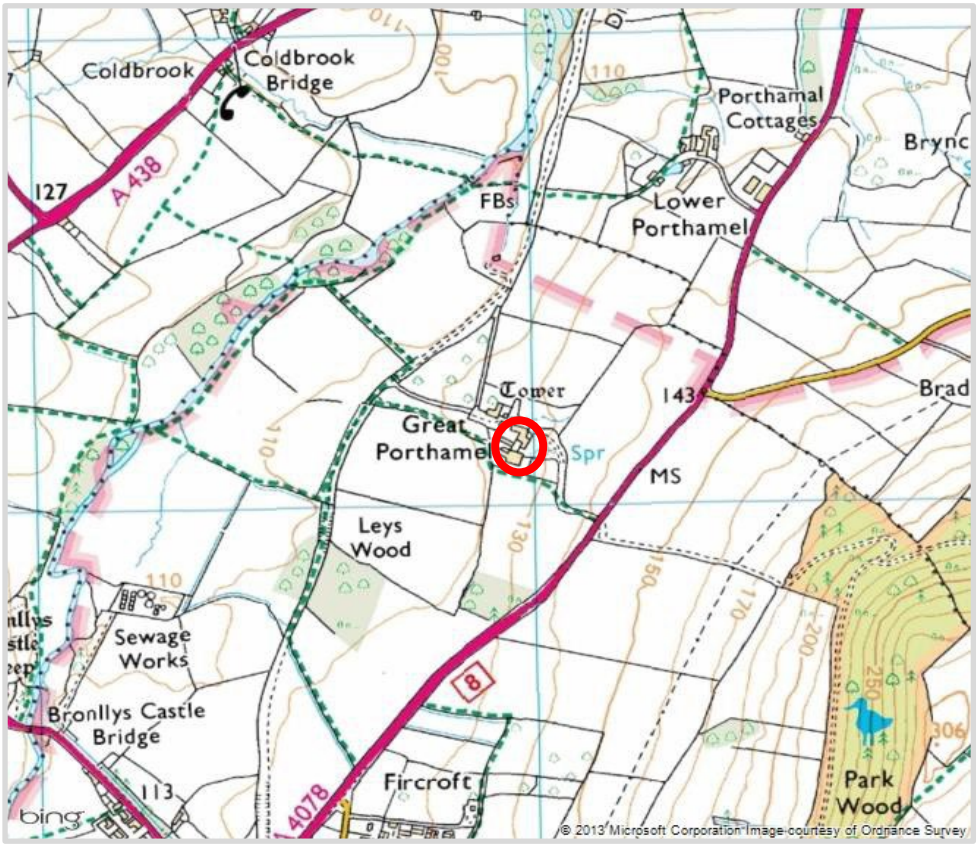
3.1 Site Location

The Site is located on a farm n the outskirts of a small town (Talgarth) in Powys, mid Wales.

Grid Reference: 316017, 235022

Site Address: GP Biotec Ltd, Great Porthamel Farm, Talgarth, Powys, LD3 0DL

Figure 3.2 - Site Location



3.2 Process Overview

GP Biotec operates an on-farm **wet, mesophilic anaerobic digestion** (AD) plant, processing waste from a variety of sources, but predominantly a mixture of animal by-product (ABP) waste and non-ABP waste from abattoirs, as well as farm energy crops (grown by the Sites affiliated farm business) into **biogas** and **digestate**.

The biogas is converted into **heat** and **electricity.** A proportion of the heat is used to heat the parts of the plant which require it and to heat Site offices and other buildings. All the electricity produced

(minus the parasitic load to operate the plant) is metered into the National Grid and sold to a renewable energy supplier.

The digestate produced by the AD process is **pasteurised** and controlled by a Quality Policy and Quality Management System. The separated digestate liquor and fibre are both certified under the **Biofertiliser Certification Scheme** and therefore no longer considered a waste material, but **biofertilisers**.

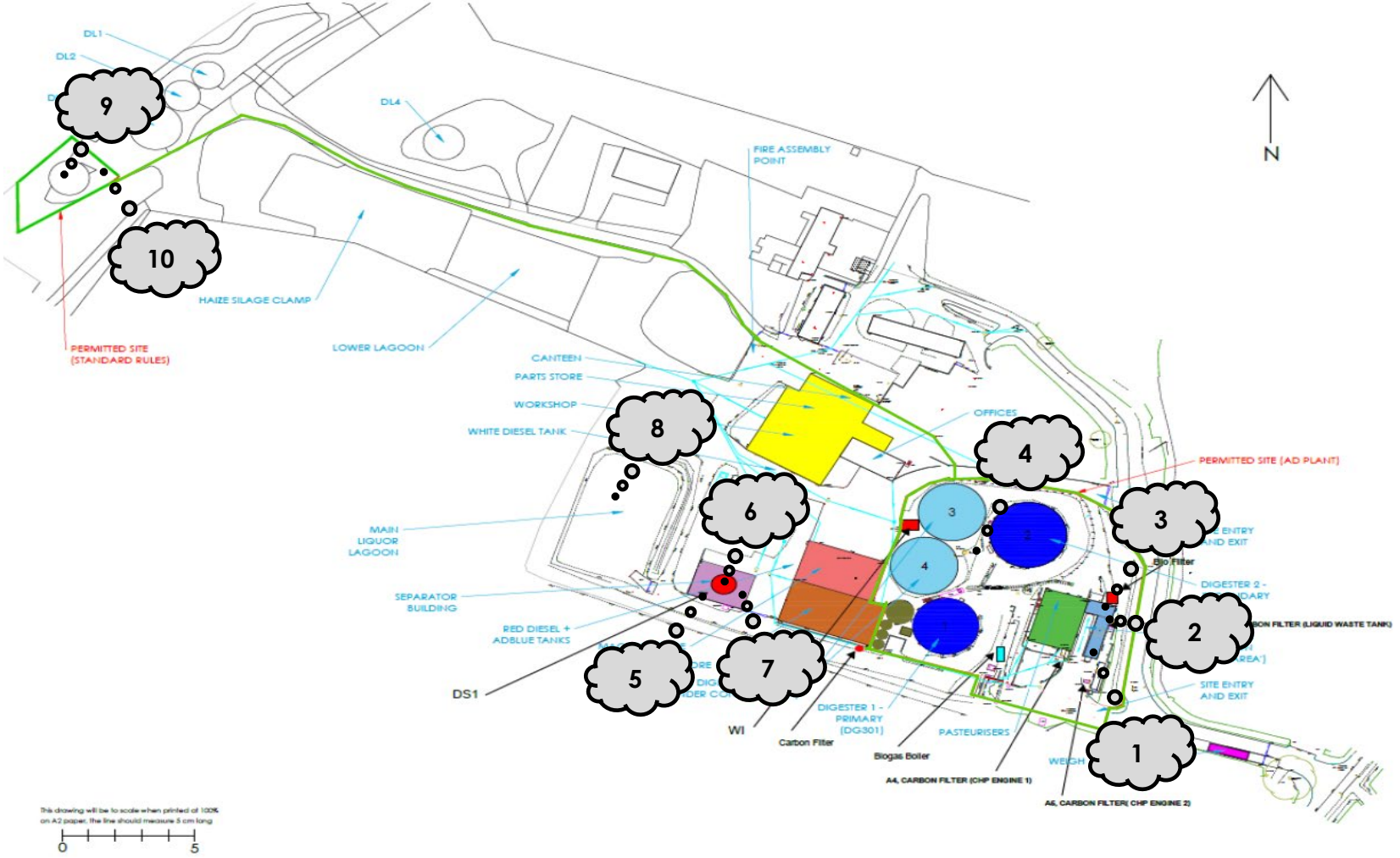
The digestate fractions are spread onto farmland owned and/or managed by GP Biotecs affiliated company GP Services (a farm business and haulage company).

3.3 Identification of Odour release points

The materials and activities with the most potential for odour include the following and are identified on the Site Plan below:

1. Waste delivery to Site & unloading of waste
2. Waste storage
3. Waste mixing
4. Digesters
5. Whole digestate storage
6. Digestate separator
7. Storage of digestate fibre
8. Digestate liquor lagoon
9. Waste storage, mixing and blending tank
10. Solid waste storage

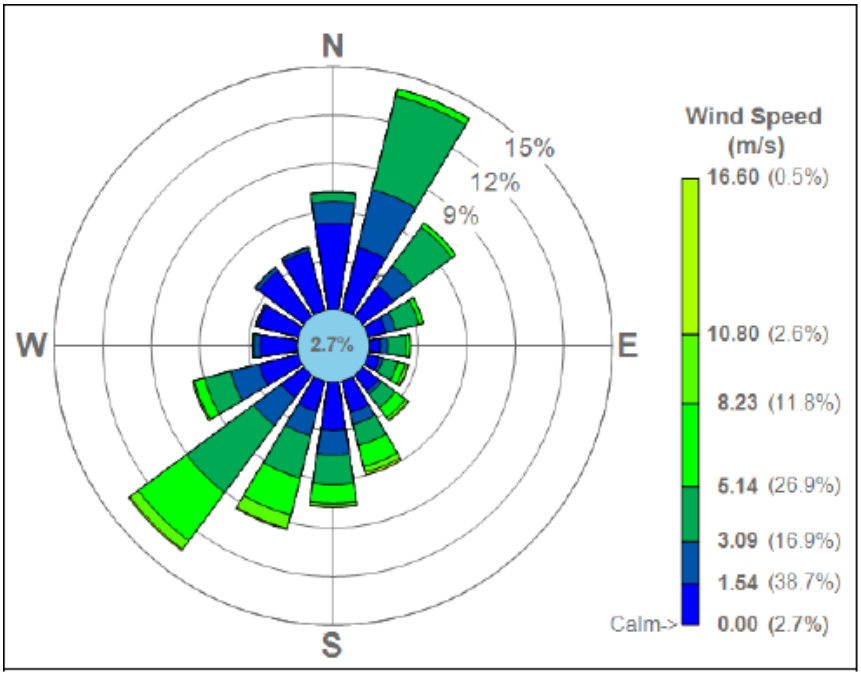
Figure 3.3- Potential Odour Release Points



3.4 Prevailing Meteorological Conditions

A summary of the prevailing wind direction during 2010 is provided below in the form of a wind rose. The wind direction which results in the majority of substantiated complaints is North-Easterly, but historically the dominant wind direction for the site is South Westerly.

Figure 3.4 - Wind Rose 2011, Sennybridge Weather Station



3.5 Nearest Sensitive Receptors

The nearest sensitive receptors within 1 km of the site are listed in Table 3.1 below and illustrated on the map in Illustration 3.2.

Table 3.1 - Nearest Sensitive Receptors

Receptor	Receptor Type	OS Grid Co-ordinates		Distance from Site	Direction
		X	Y		
Great Porthamel Mill	Residential	52.011721	-3.226314	501m	NE
Bryn Derwen, Talgarth	Residential	52.000618	-3.228886	753m	S
Ysgol Mynydd Du	Talgarth Primary School	52.001134	-3.232153	852m	SSW
Lower Porthamel Farm	Residential/Campsite	52.013099	-3.218789	791m	N

Bradwys Farm	Residential/Farm	52.009050	-3.210765	1.03km	NE
The Stables, Bronllys	Residential	52.012533	-3.238622	1.09km	NW
Residential (A479)	Residential	52.011775	-3.241364	1.12km	WNW
Riverside Caravan Park	Residential/Campsite	52.003247	-3.242612	1.27km	SW
Honey Cafe	Restaurant	52.009389	-3.244201	1.32km	W
Ffostyll Farm	Residential	51.999866	-3.220507	1.4km	ESE

Figure 3.5 - Map of Nearest Sensitive Receptors

3.6 Off-site Odour Sources

A list of sources of odour off-site, in the surrounding are detailed in Table 3.2 below.

Table 3.2 - Sources of Off-site Odour

Source	Source Description	Odour Description	Frequency	Distance	Direction
Butchers, Cross House, High Street, Talgarth	Butchers and Abattoir	Blood smell and rotting meat smell	Animals are slaughtered on a Friday	1.5km	SW

		from offal bins.			
Talgarth Livestock Market	Livestock market - intensive housing of cattle and sheep	Cattle and sheep waste	Livestock sales take place on Fridays. Liquid waste tanks are emptied on Thursday evenings.	1km	SW
Talgarth Sewage Treatment Works, Talgarth	Sewage Treatment Works	Human Sewage	Sporadic	850m	SE
Lower Porthamel Farm	Mixed farming (predominantly livestock)	Cattle manure	Seasonal	750m	N
Bradwys Farm	Livestock farming	Sheep dip, cattle manure	Seasonal	600m	NE
Great House Farm - Land	Mixed farming	Sheep dip	Seasonal	600m	SW
Trefiethal Court	Arable and apple farming	Spread poultry/ cattle manure	Seasonal	1.2km	N
Tower Lands, Trefecca Road, Talgarth	Sheep farming	Sheep waste when lambing shed being cleaned out	Seasonal	1.4	SW

Figure 3.6 - Sources of Off-site Odour map

4 Potential Odorous Activities and Control Measures under Normal Conditions

Key materials and activities with the potential to produce and release odour have been identified and are described below. Odour release points are detailed, with the pathway and key control measures under 'normal' Site operating conditions in tables for each process carried out on site.

The control measures include management techniques, procedures, and odour control measures to minimise the potential for odour generation at the points identified in Section 3.3.

The facility has been designed with a hierarchy of odour control measures based around the operational requirements of the site and has been aligned with sector best practice.

The control measures detailed below follow a hierarchical strategy and are colour coded in the table below:

1. **Prevention** of the release occurring.
2. **Containment** of the release
3. **Minimisation/reduction** of the release

Table 4.3 - Sources of odour and associated mitigation

Source Area	Activity	Pathway	Control Measures under 'Normal' conditions
Waste Reception	Arrival of waste on-site[1]	Emitted to air directly from the bulkers/tankers	• Waste Reception procedures (Pre-Acceptance, Acceptance, Rejection, transfer & Reception see Standard Operating Procedures) • Supply agreements in place with suppliers to ensure waste of a certain quality; • Inspection of all incoming wastes, to ensure they are permitted and are not too odorous, non-conforming loads rejected/removed from Site; • Regular collections from/communication with customers to ensure waste is collected before becoming malodorous; • Delivery of liquid waste in sealed tankers; • Delivery of solid waste in covered bulkers; • For Beacon Foods food waste collection - arrangement with Ysgol Mynydd Du (one of the nearest sensitive receptors) to unload outside of school hours (7.30am – 3.30pm during term time in warmer weather); • Good housekeeping - cleanliness of the Reception Area will be maintained with regular scrapping and washing down of tankers & bulkers (all cleaning water is drained into the digester) • Waste is not accepted onto the site on Bank Holidays. • Staff trained to handle delivery. Staff are trained in procedures GP-E02, GP-E03, GP-E04 and GP-E05 by the Site Manager, training records are kept on file in the Site Office.

[1] See Annex I for a breakdown of all the wastes received on Site, their approximate quantities annually and their odour classification on the Hedonic Scale

	Unloading waste on-site	Emitted to air directly from: • the bulkers/tankers; solid feeder when the roller shutter door is open for unloading	• Transfer of liquid waste to storage tanks via Bauer link; • Immediate transfer to liquid waste storage tanks or sealed solid feeder; • Solid waste loads will be tipped on arrival at the site in the dedicated hopper in the Reception Building, which is kept under negative pressure, the air is circulated 4 times every hour[2] • The electric roller door on the Reception Building will only be opened when the load of solid waste is ready to be tipped, it will be closed immediately once unloading is completed (approximately 5-10 minutes)
	Spillage during unloading liquid waste	Emitted to air directly from the spillage	• Any spillages arising from the transfer of liquid waste will be immediately cleaned up see Accident Management Plan for Spill Response Plan in Annex VI
Waste Storage	Liquid Waste Storage (* particularly abattoir blood storage)	Emitted to air from liquid waste storage tanks via carbon filter outlet (*particularly odorous H_2S from blood storage)	• Blood storage tank are fitted with an ACTUS Carbon Adsorber filter system; • Daily check for H_2S at carbon filter outlet – carbon changed if reading of 3 ppm plus; • Cooling of stored blood to a level where odour is minimised (below 20°C) – temperature monitored by Scada system; • Maintenance contract in place for chiller; • The carbon filter system has a performance guarantee for the removal of the specified annual average of H_2S at an output of 0.1ppm H_2S[3]

[2] Which goes further than BAT – see 3.3.12. Indicative BAT requirements for Waste reception and storage of How to comply with your environmental permit. Additional guidance for: Anaerobic Digestion Reference LIT 8737 Report version 1.0 and November 2013)

[3] Pure Air Solutions Proposal for Odour Control System Process Storage - AD Plant for GP Biotec Limited Annex II)

			• Feedstock level control checks daily
			• Storage tanks situated within a concrete bunded area, overflow pipes flow into bunded area leaked waste is contained. The bunded area can then be washed down and drains into the Primary Digester tank; • Daily inspections of the tanks and bunded area
			• Any leakages from the storage tanks would be identified as part of the Daily Checks Procedure and/or when trained staff are unloading. As soon as a leak is identified it would be dealt with immediately, and washings drained back into the digesters, see Accident Management Plan for details of the Spill Response Plan
	Reception Solid / waste feeder	Emitted to air from storage of solid waste (gut content, lairage waste, garlic/vegetable peelings) from solid feeder.	• Solid feeding system monitored by the plants Scada system 24/7 – the Site Manager would be alerted to any issues with the solid feeder; • Roller shutter door on solid feeder shed is serviced 6-monthly; • The Reception Building that houses the hopper is held under negative pressure. Air changed four times per hour and extracted air passes through ACTUS Carbon Adsorber filter system to remove any odours before being released to atmosphere.
			• Solid waste contained in sealed Reception Building under negative pressure/carbon filter
Digester Tanks	Anaerobic Digestion of feedstocks	Leakage of digester substrate	• The 'feeding' of the Primary Digester Tank regulated by computer programme (Proleit), this is controlled and monitored by the Site Manager via TeamViewer. The Site Manager has a permanent connection to the Team Viewer computer system via his mobile phone.

			• Daily Check procedure would alert staff to any odour around the digester tanks; • All feedstock is pumped from storage tanks via enclosed pipework[4] to the Primary Digester tank, the pump is checked daily; • All material pumped from the Primary Digester Tank to the Secondary Digester Tank is via sealed and enclosed pipework, the pump is checked daily. • Both Digester Tanks are fitted with a sealed double membrane roof; • Feeding of digestate from the Secondary Digester Tank to the pasteuriser tanks is via sealed and enclosed pipework. • High level gauges and alarms in the Digester Tanks and pasteurisers, connected to computer software (TeamViewer) prevent overfilling via interlocks; • The Digester Tanks have leak detection chambers which are checked daily as part of the Daily Checks Procedure
			• H_2S levels within the Digester Tanks are measured and recorded by the computer programme (Proleit), this is monitored by the Site Manager and Environmental Systems Manager as part of the Daily Checks Procedure. • The H_2S level after both engines carbon filters may maximally rise to 200 ppm (See TAB 3 (Annex III) for CHP1& for CHP2). At higher levels, the CHP installations must be turned off and the CHP suppliers must be consulted on how best to handle the situation[5].

[4] Pipework built to BS ISO 8085 standards

[5] TAB 3 Inspection, maintenance and monitoring Biogas Installation – HOST and 01-SAFETY PRECAUTIONS CHP GENSET ENGINE: E-3262 LE 202 and 05-MAINTENANCE CHP GENSET ENGINE: E-3262 LE 202 (Annex III)

			• If H_2S levels are particularly high and oxygen addition is not sufficient, then Ferric sulphate will be injected into the Digester Tanks. • The Primary and Secondary Digester Tanks are contained within an impervious bund (plastic liner) to contain leakages. • The pasteuriser tanks are contained in a bunded room with 110% capacity of the pasteurisers. • There is a valve on the pump - with manual tap to prevent leaks
			• Leakage from the Digester Tanks would be contained within the bunded area • Leakage from the pasteurisers would be contained in the bunded room with 110% capacity of the pasteurisers
Digesters/CHP Containers	Production/Treatment of biogas	Fugitive emission of biogas potentially emitted to air through over pressure valves on digester tank roof membranes/engine containers	• H_2S is primarily removed from the biogas by desulphurisation bacteria. The bacteria convert the H_2S in the biogas to elemental sulphur. The elemental sulphur is removed through the digestate. • The desulphurisation bacteria have to be fed with maximal 4% air compared to the biogas production. At a higher air dosage, sulphuric acid is formed, that causes damage to the concrete and parts of the roof. • The desired amount of air is added to the digester through an air pump. The capacity of the air pump is limited in capacity, so that an explosive mixture will not occur. The amount of air to be dosed depends on the biogas production (see Desulphurization Table Annex IV and Section 3 Host Manufacturers Document TAB 1 Anaerobic Digestion Annex V). • Dewatering of biogas and re-feeding of condensate into the digester (for details see Section 4 Host Manufacturers Document TAB 1 Anaerobic Digestion Annex V)

			• Carbon medium in engine carbon filters to be replaced before H_2S level reach 200 ppm as stated in TAB 3 Inspection, maintenance, and monitoring (Annex III) and by Cooper Ostlund • Daily monitoring of the carbon filter systems in accordance with the Daily Checks Procedure, the records are paper forms filled out daily and kept in the Site Office; • Double membrane gas roof on digesters • Biogas transported in high quality pipes, built to BS ISO 4437-3:2014 • A gas detection system in the engine room means that an alarm goes off if there is a biogas leak in the engine room and the engine shuts down. • The gas alarm is triggered at 10% of the low explosion threshold (see Operating Manual ETW Energietecknik GMbH Annex VI)
Whole Digestate Storage	Whole Digestate Storage	Digestate odour emitted to air from DS1 (glass coated steel tank)	• DS1 storage tank has a plastic membrane cover to seal in odours; • Pipe fitted to membrane cover creates negative air pressure – this air is then passed through a carbon filter to remove ammonia odours. • Digestate is transferred from the pasteurisers to the Storth storage tanks via pipework built/welded to BS ISO 8085 standard; • Lengthy retention time in digesters and regular substrate testing to ensure fully digestated and therefore less odorous product is created
			• Leakage from DS1 would be contained within the digestate storage building, and leakage would collect in the underground silage clamp
Digestate Separator	Separation of whole digestate into liquor and fibre fractions	Ammonia odour emitted from galvanised tank on top of separator to carbon filter	• Samples of pasteurised digestate are tested regularly by an UKAS accredited laboratory to make sure the digestate is PAS 110:2014 compliant. • Galvanised feeder tank kept under negative air pressure;

			• Overflow pipe flows back into DS1 digestate storage tank • Storage has sealed doors and walls
Digestate Fibre Storage	Separated digestate fibre	Ammonia odour emitted to carbon filter	• Digestate fibre removed regularly during periods of warmer weather to avoid build-up of store and therefore build-up of odour
	Transfer of digestate fibre to off-Site location		• REA Biofertilizer Certification /Compliance with PAS 110:2014 and the ADQP
Digestate Liquor Storage Lagoon	Separated digestate liquor	Ammonia odour emitted to carbon filter	• A natural crust forms on top of the lagoon which minimizes the escape of ammonia to the atmosphere; • Bunded lagoon, registered with Natural Resources Wales (see submitted WQE3 form)
	Transfer of digestate liquor from lagoon to off-Site locations		• REA Biofertilizer Certification /Compliance with PAS 110:2014 and the ADQP; • To minimise potential odour, digestate is stored in the lagoon for no longer than 6 months. This is less than the limit of 12 months stated in the Standard rules SR2010No4 Mobile plant for land spreading Waste permit that GP Biotec holds. • GP Biotec has sufficient storage capacity during times when the land-bank may be unavailable for prolonged periods, where the land is waterlogged or frozen and to span the winter no spread periods, this is considered BAT[6]

[6] See How to comply with your environmental permit. Additional guidance for: Anaerobic Digestion Reference LIT 8737 Report version 1.0 and November 2013

Waste storage, mixing and blending tank	Storage of incoming wastes preparation and mixing.	Odorous emissions to air	• Only pre-arranged waste accepted. (Waste must undergo Pre-Acceptance, Acceptance, Rejection, transfer & Reception. See Standard Operating Procedures) • Waste accepted only once it passes the pre-acceptance criteria. • Delivery of liquid waste in sealed tankers. • Delivery of solid waste in covered bulkers. • Sealed connection from delivery tankers to storage mixing and blending tank via Bauer connection. • Air Spectrum odour control unit fitted to tank, with capability to neutralise constant odour production. • Odour walks conducted daily as part of the operator's daily checks. • Regular maintenance of mechanical mixer within tank, minimising chance of disruption to transfer of waste to digestion. • Good housekeeping - cleanliness of the Reception Area will be maintained with regular scrapping and washing down of tankers & bulkers (all cleaning water is drained into the digester) • Storage, mixing and blending tank situated within an impermeable concrete bunded area.
Waste Storage – Standard Rules area to be added	Storage of waste/products	Odour emissions to air	• This portion of site is pre-existing so will not introduce any new odour sources • Waste storage in this area is managed in accordance with the policies and practices implemented elsewhere on site • Waste storage in this area has not resulted in odour complaints previously, and it's inclusion in the current Installations permit will not inherently change its overall odour potential

4.1 Incident and Emergency Planning

Consideration has been given to the types of foreseeable failures or abnormal events that have the potential to result in an odour impact and what additional controls would be necessary. The table below describes these abnormal conditions, the additional control measures required and how these are actioned, when and by whom.

The plant is monitored so closely on a daily basis that at the first signal that any part of the process is failing due to a fault with equipment/imbalance in the microbes, a response is immediate (See Accident Management Plan). GP Biotec has a running agreement with Marches Biogas, who advise on the running of the plant based on samples from the digesters and provide advice as appropriate. However, in the event of the failure of the anaerobic digestion plant this may result in a delay in processing waste received. The magnitude of the impacts will depend on the length of the breakdown and the type and volume of waste held in the storage tanks yet to be processed. This waste could have the potential to result in the release of odour if the facility were 'on stop' for longer than 24 hours; in this eventuality the site has the capacity to store the waste for a considerable period.

The farm also holds a Standard Rules SR2010No4 Mobile plant for land spreading which means that if required the waste received by the site could be spread to land in an emergency, in compliance with the permit. There could be odour associated with this process, but it would be short-term.

Table 4.4 - Failure and Abnormal Conditions Control Measures

Failure/Abnormal Conditions	Issue Arising	Additional Control Measures	Time limit	Responsibility
Abnormally high temperatures (26°C +)	Stored blood becomes odorous	Reduce temperature of the chiller	Immediately	Site Manager
	Stored digestate fibre becomes odorous	• Remove from Site to field tumps; continue to remove to off-site storage; • If during term time switch off separator during the hours of 7.30am-3.30pm to prevent odour reaching sensitive receptors	Immediately	Site Manager
	Odorous waste *particularly Beacon Food waste	Collect waste during cooler times of the day – during term time loads to be collected and unloaded earlier than 7.30am, if not possible then during the late afternoon/evening	Immediately	Site Manager/Drivers
Fire[7]	Odour impact likely to be from burning infrastructure/burning biogas	• All staff alerted • Inform fire brigade[8] & NRW • If safe and practicable to do so dependent on size and location of fire, prevent fire spreading to explosion zones; • Inform Community Council and Community Liaison Group of the incident	Immediately	Site Managers
Power cut	The second CHP engine has been installed and can run in 'Island Mode', therefore despite a power cut the plant can keep running as normal.	If the second CHP engine failed, there may be minimal short-term odour related to the waste being held in storage. If power was down for more than 6 hours we would hire a generator to provide electricity until mains power was restored (this would take less than 6 hours to sort out).	Immediately	Site Manager

[7] In the event of a fire (on site) dependent of the size and location of the fire, site infrastructure may be compromised, see Fire Risk Assessment

[8] The local Fire Brigade have visited the Site on numerous occasions and the Fire Action Plan is stored in the weighbridge shed at the entrance to the Site

Road Closure	Closure of the A4078 from the North would limit access to the site for waste deliveries, this would have little impact on the odour management at the site and deliveries could be temporarily halted. If the entire A4078 was closed it would limit access to the site contractors and site staff (although the Site Manager resides on the farm where the site is situated, so the impact would be minimal). The site can be controlled remotely via the computer software (TeamViewer) in place.	• Waste could potentially be re-routed through Talgarth temporarily if the Town Council and Community Liaison Group were consulted; • The site can be controlled remotely via the computer software (TeamViewer) in place	Immediately	Site Manager
Plant Failure:	Increased odour emissions due to failure of key process plant	• In the event of plant failure, the site will be shutdown immediately as to prevent odour emissions being released by damaged or faulty plant • Plant will be inspected and repaired as soon as possible to ensure that any odour impacts are short-term and minimal	Immediately	Site Manager

		• Where replacement plant can be hired, this may be considered if repairs are likely to take a longer period of time, beyond what is reasonably expected • When repairs cannot be made and no alternative plant can be hired, waste will be removed, and no further deliveries will be accepted. • Plant failure is deemed highly unlikely due to the site's ongoing inspection and maintenance program that seeks to repair signs of damage or wear before failure can occur.		
Electricity Supply Failure	Odour from liquid waste storage because chiller and carbon filter would stop working	CHP2 Engine 'island mode' would be utilised, this would be able to sustain the supply of electricity to the plant. If CHP 2 failed a generator could be used.	Immediately (CHP2 'island mode') 24 hours (generator)	Site Manager
Failure of National Grid	Possibility of odour emanating from digester rooves if pressure relief valves activated; waste received onto site stored.	Western Power contacted to solve the problem. If odour on Site became an issue diverting the waste coming to Site would be considered to reduce methane production.	Immediately contact Western Power If waste storage is at 80% capacity and the (dependant on waste deliveries)	Site Manager

			Possibility of storing waste under Standard Rules SR2010No4 Mobile plant for land spreading	
Failure of Anaerobic Digestion process e.g. waste feedstock could contain contaminants that could negatively impact upon the anaerobic digestion process	Possibility of odour from waste storage if feeding is reduced or halted	Stop feeding and investigate – FOS/TAC, review feeding trends & gas yields. If no feeding for 48 hrs – consider storing waste on waste under Standard Rules SR2010No4 Mobile plant for land spreading or diverting waste. Contact HOST & Biogas Analytic for advice Circulate contents of Tank 2 into Tank 1 to dilute contents of tank 1 to increase bacteria in Tank 1. Additives to prevent foaming e.g. oil seed rape oil Pasteurise contents of digester and then transfer to storage in our Standard Rules Permitted Site (EPR/GB3631AP)	Immediately	Site Manager

Staff Absence	Low to no impact in terms of odour	Short-term staff shortages (such as a few days illness) will not affect the ability of the site to operate effectively as other staff members can be reassigned to critical operations. In the event of prolonged absence of staff members, GP Biotec would recruit temporary staff and provide training. These measures will also be employed if widespread absence occurs amongst staff members (such as food poisoning).	3-4 days	Site Manager
Vandalism/Site security	No or low impact	Unauthorised entry and tampering/malicious damage to property, plant and equipment is minimised by a secure gate and perimeter fence and all Site buildings have coded locks on them. The Site gate is locked out of hours and tanks and valves locked when not in use or out of hours. Plant and equipment are locked in secure storage out of hours. There are also 4 CCTV cameras which are monitored. Site Manager and Site Director reside on Site.	Immediately	Site Manager

4.2 Trigger Points and Contingency Planning

Various trigger values have been identified, and as a result of routine checks and inspections, if any of these values was exceeded, the Site Manager/Operations Manager will be required to take appropriate contingency measures. Exceedance of the control levels in Table 6.1 will result in further investigation into the causes of any odour and will instigate additional monitoring. Actions will be taken to abate any odour being produced on site.

Table 4.5 - Trigger Points

Trigger Point	Contingency Actions
Blood in storage tank exceeds 20 °C[9]	Reduce the chiller temperature
H_2S level from odour abatement carbon filter exceeds 3ppm[10]	Carbon media to be refreshed or replaced immediately[11]
Level of H_2S in Digester tanks rises above 200 ppm	Addition of O_2/ferric sulphate injection Immediate renewal of carbon media in carbon filter
On Site Odour Intensity 3	Two hourly monitoring & investigation
Receipt of Complaint	Complaint monitoring & investigation
Plant Failure (i.e. Foaming level 5)	Stop feeding and investigate. Contact HOST & Biogas Analytic for advice Circulate contents of Tank 2 into Tank 1 to dilute contents of tank 1 to increase bacteria in Tank 1. Additives to prevent foaming e.g. oil seed rape oil Consider possibility of storing waste under Standard Rules SR2010No4 Mobile plant for land spreading.

[9] Is considered BAT The Red Meat Processing (Cattle, Sheep and Pigs) Sector (EPR 6.12)
[10] See EH40/2005 Workplace Exposure Limits (Annex VIII)
[11] See instructions for refreshment of carbon media and replacement of media (Annex IV)

	Consider diverting waste
Meteorological conditions of 22°C + and wind direction SW	Collect Beacon Foods waste outside of school hours (7.30am - 5pm)

5 Management

This section of the OMP describes the following:

- roles and responsibilities of personnel on Site;
- the training and competence of staff in odour-critical roles;
- details of how the plan is implemented and maintained;
- responding to odour-related incidents;
- planned maintenance/repair and keeping of essential odour-critical spares;
- regular review of the OMP;
- community engagement;
- record keeping.

5.1 Review of the OMP

This plan will be reviewed annually by the Environmental Systems Manager from the date of acceptance by Natural Resources Wales (NRW) and amended as required. Amendments may be made more frequently should a method pertaining to odour management change in the interim and this will be considered to supplant the aforementioned annual review.

5.2 Roles and Responsibilities

The table below sets out the responsibilities relating to the OMP, the Site's Organogram can be found in Annex VII.

Role	Responsibility
Overall Implementation of the OMP	Site Manager & Environmental Manager
OMP related Training of Staff:	
Daily Checks	Site Manager
Odour Monitoring	Site Manager, Environmental Manager
Odour Monitoring:	
Routine On-Site Monitoring	Site Operatives, Site Manager
Complaint Monitoring	Site Manager, Environmental Manager
Liaison with complainants	Site Manager, Environmental Manager
Record Keeping	Environmental Manager, Agricultural Administrator
Community Engagement	Site Manager, Environmental Manager
Review of OMP	Environmental Manager

5.3 Training

Training on odour related activities is done in-house, records of all training are found in the Sites Training Matrix. Tool Box Talks are carried out to all members of staff. The Site Management team conduct the site investigations and follow ups to odour complaints being received.

5.4 Implementation and Maintenance of the Plan

The OMP is implemented daily via the odour monitoring that forms part of the Daily Checks, this and the engagement with the local community via the Community Liaison Group that is in place, enable effective monitoring and responsiveness.

Part of the monitoring strategy is to record weather conditions via the on-Site weather station. The station automatically records the conditions on the site continuously, including temperature, wind speed and direction, and conditions (i.e. dry, precipitous). The data is stored on the website https://www.wunderground.com/personal-weather-station/dashboard?ID=ITALGART2

5.5 Responding to odour-related incidents

5.4.1 Odour detected On-Site

Odour monitoring is carried out daily as part of the 'Daily Checks', if an odour with an intensity of 3 is detected an investigation will be carried out. Part of the investigation is contained within the 'Daily Checks' e.g., H_2S levels at the carbon filter, temperature of the blood storage tank. The Site Manager and Environmental Manager will record the information in the On-Site Odour Investigation Form and rectify any odour issues immediately. In compliance with BAT (10) procedures, substantiated complaints will be followed up by undertaking continued daily monitoring checks and a Dynamic Olfactometry Test if the odour is persistent and offensive. This will involve taking a sample of gas / air and sending to an Olfactometry Laboratory for odour intensity measurements in accordance with EN 13725 and EN 16841 standards for odour concentration and exposure. The approved Olfactometry Laboratory is Air Spectrum Environmental.

5.4.2 Odour detected Off-Site

If odour is detected off-site, GP Biotec will review operations to rectify problem as soon as possible. An odour walk will be undertaken of site to determine the potential causes and an off site investigation will also be undertaken. This includes an odour check to be conducted at points located on the odour map. If there is odour detected off site that is directly linked to the operations of the AD site, then this will result in continued monitoring and mitigations measures taken on site to

reduce the odours detected. It is essential that the site AD process odours are not linked to any odours arising from the spreading of digestate which is outside of the permit scope.

Delivery of waste to site will not be halted as the anaerobic digestion process is continual and the process can be upset significantly by changes in volume or even type of waste. In fact, by altering things significantly, odour impact could rather increase, therefore improvement by closure of the site is not workable in this instance. Investigating source of odour and amicably mitigating its spread has always proven successful.

5.4.3 Complaint Handling and Monitoring

Odour complaints are received by the site in two ways, either through NRW or direct contact to the site. Complainants are encouraged to use the NRW Hotline **0800 807 060**, or preferably the Site Office contact number - **07494 899205**.

If a complaint is received from the public (either direct to GP Biotec or via NRW or Environmental Health) a thorough investigation will be undertaken which comprises odour monitoring and a full investigation into on-Site activities, this information is recorded in the 'Complaint Monitoring Form' and the 'Complaint Response Form' (see Annex VII) and the 'Complaint and Inspection Log'.

Feedback would be provided to the complainant via the same route that the complaint was initially made, i.e. if the complaint was made via NRW the feedback would be sent back via NRW immediately. Our aim is to respond immediately to complaints, at the latest within 24 hours.

5.4.4 Odour Monitoring

Monitoring points have been identified to provide an overall assessment of odour at the site boundary and at the nearest sensitive receptors; any off-site odour sources not near a monitoring point are also included, all of these points are listed and illustrated in the table and map below respectively:

Table 5.6 - Odour Monitoring Points

Monitoring Point Number	Monitoring Point Description	Monitoring Point Location
1	Site Entrance	East
2	Second bend in the private lane	North
3	Junction A4078 and Hay Road	South West
4	Talgarth Medical Centre	South West

5	Brian George Butchers/Abattoir, Cross House, High Street, Talgarth	South West
6	Talgarth Livestock Market	South West
7	Talgarth Sewage Treatment Works, Talgarth	South East
8	Riverside Caravan Park	West
9	Honey Cafe	North West
10	Pontithel	North
11	Junction of A4078 and A438	North East
12	Junction of Velindre Road and A4078	North East

Sniff tests[12] at these monitoring points are carried out daily and may be used to provide information on odour levels where the purpose of the monitoring is to:

- Demonstrate if actions taken to reduce odours have been effective;
- Demonstrate compliance with permit conditions; and
- Carry out continuous checks on effectiveness of the control measures in place.

All results of sniff tests will be recorded in the Odour Monitoring Form (see Annex IX) that forms part of the 'Daily Checks'.

[12] Sniff test monitoring shall be carried out in accordance with the monitoring protocol contained within the Environment Agency's Technical Guidance Note H4 Appendix 1

Figure 5.7 - Monitoring Points Locations

5.4.5 Complaint and Corrective Action Monitoring

Details of complaints are recorded in the 'Complaint & Inspection Log' and include, date and time, nature of complaint, name of complainant (if given), a summary of the investigation/monitoring instigated as a result of the complaint, their results and feedback given to the complainant.

In the event of a complaint a trained member of staff will aim to investigate the odour as soon as the complaint has been received. The investigation will include the following:

- A sniff test at the location of the complaint
- Sniff tests at all the monitoring points identified in Table 7.1
- A consultation with Team Viewer to check the plant is running normally
- Checks that the carbon filters on site are both working normally
- Checks that the Reception Building is being maintained under negative pressure and that the air flow is normal.

- Meteorological conditions at the time of the complaint will be recorded.

All of the information above will be recorded in a Complaints Response Form, feedback relating to the report will then be given to the complainant direct or via NRW.

Complaints are reviewed annually as part of the Annual Report submitted to NRW by GP Biotec in accordance with their Environmental Permit conditions.

5.5 Planned maintenance/repair and keeping of essential odour-critical spares

Any maintenance that could potentially impact the local area would be carried out in meteorological conditions most conducive to minimising impact, for example:

Potentially Odorous Activity	**Measures to Minimise Impact**
Changing of odour control carbon in filters	• Coolest part of the day (early morning or late evening); • South-westerly wind; •
Cleaning out of digester tanks	• If possible south-westerly wind; • Inform NRW • Inform Community Liaison Group & announce on FYI Talgarth that there may be odour during maintenance work

5.6 Community Engagement

Community Liaison Group meetings to be held every six months between GP Biotec, Natural Resources Wales (NRW) and Talgarth Local Council to discuss past, present and future operations and provide an open forum for discussions, to ensure that the local community is kept up to date on improvements and activities on site.

If an action is being considered that may cause temporary odour, outside of the normal operational procedures, then before such action is taken NRW will be informed on **0800 807060** and by informing the NRW officer for the site. Neighbours who may be affected will be contacted to advise them of the operation being undertaken and that any increase in odour will be of a temporary nature.

6 Record Keeping

Records of the following will be kept on site:

- Results of daily odour monitoring;
- Meteorological data;
- Operational problems including date, time, duration, prevailing weather conditions and cause of problem.
- Details of corrective action taken and any subsequent changes to operational procedures and evaluation of the effectiveness of control and abatement techniques used.
- A complaints log will be maintained.
- Notification to NRW of abnormal/odorous activities on site
- Substantiated complaints and associated olfactometry tests

7 Audit and Reporting

The Environmental Manager will carry out an annual audit of the measures put in place by the OMP to verify if the measures are working well and whether any improvements need to be made.

The number of complaints made to the Site will be reported annually in the Site's Annual Report submitted to NRW in January of each year and any pertinent points from the audit will also be reported.

8 Future Improvements

Future odour related objectives for GP Biotec include:

Future Objective	Timescale	Responsibility
Formal auditing process of the OMP to be developed	2022	Environmental Manager
Implement BAT procedures in line with revised permit	2022	Environmental Manager

Appendix I - Classification of Waste Odours

Material Description	Odour Description	Hedonic Scale	Pattern of release	Potential Problems
Blood	Sulphurous, rotten cabbage, putrid	-4	Expected to peak during unloading. Material is transferred to storage as soon as it arrives on site.	Carbon filter and/or chiller failure. Increased volumes of blood stored over Bank Holiday weekends. Extremely hot weather.
Gut content & lairage	Sweet, gassy, pungent, rotting grass	-3	Expected to peak during unloading. Material is processed as soon as it arrives on site.	Failure of negative air pressure in Reception Building
Wastewater/ DAF sludge	Slurry, fat	-2	Expected to peak during unloading. Material is transferred to storage as soon as it arrives on site.	Carbon filter failure.
Garlic/vegetable waste	Strong garlic/rotting vegetable smell		Expected to peak during unloading. Material is transferred to storage as soon as it arrives on site.	Carbon filter failure

Appendix II – Pure Air Solutions

PURE AIR SOLUTIONS

Proposal: 1400096-0
GP Biotec Ltd
10th August 2014

5.0 Guarantee

The applicable guarantee is divided in a mechanical guarantee on equipment and a performance guarantee on the media.

5.1 Mechanical Guarantee

Our guarantee for this project covers a period of 12 months after commissioning and date of acceptance of the installation or 18 months after notification of readiness for shipment, whichever comes first, normal wear and tear excluded. Mechanical guarantee covers parts, materials and labour, but explicitly excludes maintenance, operation and travel/lodging expenses.

5.2 Performance Guarantee

The performance guarantee for removal of the specified annual average of H2S is an output of 0,1ppm H2S.

The performance guarantee is based on the airflow characteristics/conditions and specified regeneration periods as mentioned in this quotation and only valid in case the equipment is properly and regularly maintained in accordance with the specified instructions.

The media life time is >24 months, taken into account an expected regeneration period of > 4 months for the specified inlet H2S concentration.

We trust this proposal is of interest, however, should you have any queries or require any additional information please do not hesitate to contact us immediately.

Best regards,
Pure air solutions (UK) Limited

Bob Hines
Director

Appendix III – TAB 3 HOST

See Site Documents – Site Office

Appendix IV – Desulphurisation Table

Thermen 10,
7521 PS Enschede,
The Netherlands
Tel.: +31 (0)53 – 4609080
Fax: +31 (0)53 – 4609089
E-mail: info@host.nl
Internet: www.host.nl

HoST BIO-ENERGY INSTALLATIONS

Bank: ING rek. nr. 65.85.11.920
K.v.K. Enschede nr. 06091862

Desulfurization table

In the table below, at diverse gas productions the settings are displayed on which the air pump has to be set in that case.

Biogas-production [m³/day]	Biogas-production [m³/hour]	Air pump 4% [m³/hour]
600	25	1,0
1.200	50	2,0
1.800	75	3,0
2.400	100	4,0
3.000	125	5,0
3.600	150	6,0
4.200	175	7,0
4.800	200	8,0
5.400	225	9,0
6.000	250	10,0
6.600	275	11,0
7.200	300	12,0
7.800	325	13,0
8.400	350	14,0
9.000	375	15,0
9.600	400	16,0
10.200	425	17,0
10.800	450	18,0
11.400	475	19,0
12.000	500	20,0

Appendix V – TAB 1 HOST

See Site Documents – Site Office

Appendix VI – Engine Operating Instructions

See Site Documents – Site Office

Appendix VII - Organogram

See Site Documents – Site Office

Appendix VIII - Complaints Response Form

ODOUR COMPLAINT REPORT FORM		
Time and date of complaint:	**Date:**	**Time:**
Name and address of complainant:		
Contact details 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?		
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
6	Extremely strong odour

Appendix IX – Odour Monitoring Form

Name of Assessor:				
Survey timings		**Date**		
		Start Time		
		Finish		
Monitoring Point	**Location**	**Odour Intensity**	**Odour Extent**	**Odour Description**
1	Site Entrance			
2	Second bend in the private lane			
3	Car park Ysgol Mynydd Du			
3	Junction A4078 and Hay Road			
4	Ysgol Mynydd Du			
5	Talgarth Medical Centre			
6	Brian George Butchers/Abattoir, Cross House, High Street, Talgarth			
7	Talgarth Livestock Market			
8	Talgarth Sewage Treatment Works, Talgarth			
9	Riverside Caravan Park			
10	Honey Cafe			
11	Pontithel			
12	Junction of A4078 and A438			
13	Junction of Velindre Road and A4078			
Other Comments				

Odour Intensity	
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)

Odour Extent	
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