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LON HEN FELIN WASTE TREATMENT AND TRANSFER FACILITY

ODOUR MANAGEMENT PLAN

Prepared for

Gwynedd Skip & Plant Hire Limited

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ODOUR MANAGEMENT PLAN

Date: May 2017

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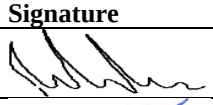
1	Issued to NRW	May 2017	**Prepared By:** R. Barlow		04/05/2017
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DRAWINGS

1 INTRODUCTION

1.1 Background

1.1.1 Gwynedd Skip & Plant Hire Limited operate a waste treatment and transfer facility located at Lon Hen Felin on Cibyn Industrial Estate near Caernarfon. An Environmental Risk Assessment has been completed for the operations at site, however, in order to provide additional assurance with regards to odour, an Odour Management Plan (OMP) has been produced to support the current permit variation application being determined by Natural Resources Wales (NRW).

1.1.2 The site is primarily used for the physical processing of incoming skip waste from commercial / industrial premises and householders.

1.1.3 All incoming wastes are deposited within the confines of the operations building for initial sorting. The facility can process up to 75,000 tonnes of waste per annum. Inside the building the incoming materials are fed into a trommel followed by the manual sorting, covered conveyor that extends out of the building, with underlying designated storage bays as shown on the Site Layout Plan (ref: 2858/1/002). In addition, small quantities of organic & inorganic fines will be stored in designated bays prior to being transferred from site, also as shown on the Site Layout Plan. Residual, suitable non-recyclates will be processed into Refuse Derived Fuel (RDF), which will be exported from site for recovery through incineration.

1.2 Reference to the Guidance

1.2.1 This Odour Management Plan (OMP) has been prepared in accordance with the following guidance documents:

- *An industry guide for the prevention and control of odours at bio-waste processing facilities – The Composting Association 2007*
- *European Commission Waste Treatment Industries BREF (August 2006) and,*
- *H4 – Horizontal Odour Guidance.*

1.2.2 Current regulatory guidance suggests a Source → Pathway → Receptor model be adopted with an emphasis on implementing effective and robust controls for odour abatement at the earliest stages possible (i.e. at source). The guidance acknowledges that assessment and control of odour can be difficult due to dispersal and the episodic nature of odour events. Assessments therefore are usually based on conservative worst case scenarios and are not a reflection of the preventative operational practices at the site.

1.2.3 The 'H4' guidance provides a regulatory framework by which a permitting officer can ensure an installation's compliance by the provision of specific conditions. H4 states that the Best Available Technique (BAT) is often site-

specific and can be determined by the controls necessary to meet benchmark odour concentrations at ground level at sensitive receptors.

1.2.4 This document provides a summary of the physical and management controls that will be employed to minimise odour release. It provides a site-specific assessment of the potential sources of odour, the pathways odour can take from the site and the receptors it is likely to impact. The potential release points of odour are identified, as are the management systems to prevent and control fugitive odour emissions. Monitoring and reporting systems are also described, as are emergency contingency plans.

1.3 Appraisal of Applicable Monitoring Techniques

1.3.1 The applicable monitoring techniques in this context are interpreted as the daily odour monitoring methodologies (olfactory) up and down wind of the site. Monitoring of operational control measures are listed separately. These have been reviewed in the context of the most recent guidance (i.e. H4) and updated accordingly.

1.4 Operational Control Measurers and Monitoring Techniques

1.4.1 The operational control measures and monitoring techniques to be implemented are detailed in this management plan and consider the odour source term identification process in Section 2.

1.5 Contingency Plans

1.5.1 Contingency plans for the potential odour source hazards are detailed in Section 5 below. These are based on current operational practices at the site and are subject to regular review by appropriately qualified personnel.

2 ODOUR SOURCE TERM CHARACTERISATION

2.1 Odour Source

2.1.1 The following sources of odour are considered in this section of the assessment:

- Odours from stored wastes in the building (prior to processing or transfer);
- Odours from the wastes stored following treatment; and
- Odours from waste processes during segregation.

2.1.2 Each of the above hazard source terms are described in greater detail below in the context of specific sources, and potential release points.

2.2 Waste Reception

2.2.1 Table 1 summarises the odour potential of each waste stream on site, the relative odour risk that waste stream may present to receptors and odour mitigation in terms of residence times. Further detail on each waste stream is provided below the table.

2.2.2 Mixed skip wastes from demolition and excavation projects will constitute the principal element of the materials received at the facility. Residual materials separated from the incoming skip wastes will contain the fraction of the municipal waste and consists of the following materials:

- paper and card;
- plastics;
- residual amounts of putrescible materials;
- metals; and
- textiles.

2.2.3 The site is currently permitted to accept biodegradable kitchen and canteen waste, however, these particular waste streams are not currently accepted at the site. Should this become a commercially viable option for the operator to undertake these collections, the OMP will be reviewed and updated accordingly. The odour generation potential of the currently accepted wastes is considered low on account of the non-putrescible nature of the waste. The odour generation potential is also linked to the age of waste prior to collection.

Table 1.Individual Waste Stream Odour Potential

Waste Stream	Odour Potential	Reason	Approximate Proportion of Waste Received	Compositional Consistency of Waste Stream	Priority
Mixed Skip Wastes	Low to Medium	Waste stream contains residual materials present in the incoming C & I skip wastes consisting predominantly of dry recyclables e.g. paper / textiles may degrade, but not to same extent as food waste. No existing canteen/food waste collection contracts.	100%	Variable composition	First

2.2.4 The Chartered Institute of Wastes Management (CIWM) and the Waste Resources Action Programme (WRAP) commissioned a review[1] that considered the odour generation potential of stored residual MSW. The review indicates that the volatile organic compounds (VOCs) from domestic waste generally peaked at one week whilst other compounds such as ammonia continued to increase over a 14 day storage period. Weather and storage conditions were also found to affect odour production. Overall, the review indicated that some odorous compounds may diminish and some increase between 7 to 14 days. The review reports typical odours that may be generated from residual MSW include those linked to microbial decomposition of the organic fraction and those associated with packaging materials and household products such as detergents. In general typical odour compounds are reported to include:

- VOC's including chlor-organics,
- hydrogen sulphide (rotten eggs),
- mercaptans (rotten vegetation e.g. cabbage) and
- amines (fishy smell).

Additionally it has been reported that alkanes, alkybenzenes and terpenes have been responsible for undesirable odours from kerbside waste containers[2].

2.2.5 The CIWM/WRAP review indicates that composition of the odorous chemicals change with time, some diminish whilst others increase, however overall it is recognised that the longer the storage time the greater the odour generation potential. In addition it is also understood that the warmer the waste the greater the odour production potential. The volume of waste stored and the depth of waste (which may result in anaerobic conditions and heat) are all factors that influence odour generation. These issues are all addressed in this report.

[1]Scoping Study of Potential Health Effects of Fortnightly Residual waste Collection and Related Changes to Domestic Waste Systems, Final Report, July 2009
[2]Statheropoulos M., Agapiou A., Pallis G. (2005) A study of volatile organic compounds evolved in urban waste disposal bins. Atmospheric Environment 39:4639–4645

Commercial and Industrial Wastes

2.2.6 Wastes may also be accepted from trade deliveries from private companies within the surrounding area, however, it is considered that these will consist of similar composition to that of the operator's incoming materials i.e. predominantly demolition and excavation contracts and householder skip loads.

Summary

2.2.7 The components of odorous compounds in the building are likely to vary depending on proportion of the incoming wastes accepted, however, the percentage of residual putrescible wastes is considered to be negligible. Odour tends to consist of a complex mix of chemicals in gaseous form, as described above wastes of the nature to be accepted exhibit accepted exhibit the following typical odours: VOC's including chloro-organics, hydrogen sulphide (rotten eggs), mercaptans (rotten vegetation e.g. cabbage) and amines (fishy smell).

2.2.8 The age of waste received and storage temperature will influence odour type and generation. It is recognised that in general increased odours are linked to longer storage of municipal type waste. However only a minority of odorous compounds appear to increase consistently with longer storage, therefore targeting particular odorous compounds is difficult. It is considered that actions aimed at reducing storage times, limiting stockpile sizes, minimising temperature, limiting evaporative losses and controlling odorous inputs are preferable and more practical control methods.

2.2.9 A summary of the activities carried out in the waste reception area of the building and how they might influence the odour potential of specific waste streams is detailed in Table 2.

Controls

2.2.10 Control systems and management controls relating to the stockpiles are discussed in Section 3 below.

Table 2.Odour Potential of Waste Streams at Waste Reception

Waste Stream	Deposit of waste in Reception Area	Loader transfer of waste into bays or shredder
Mixed Skip Wastes	**Low to Medium** • Odour which may have built up in vehicle will be released on deposit of wastes; • Deposit of wastes on floor may cause any bags / containers to split releasing odour; • Odorous wastes may taint other non-odorous material in the vehicle / building; • Unless tainted by odorous waste streams, odour potential should be low.	**Low to Medium** Waste will be disturbed when excavated from pile and when deposited but not agitated excessively (compared to shredding)

Potential Release Points

2.2.11 Waste is to be directly discharged into the building. The building has a designed capacity of approximately 2,000 tonnes for unprocessed wastes. It is very unlikely that this amount of waste will be deliberately accumulated in the reception area however and it is the operator's aim to process all accumulated

waste as soon as practicable. The priority will be to process the MSW waste first and any similar I&C waste. MSW will not be retained in the building for longer than 72 hours total (including processing and storage times prior to dispatch) to allow for weekends, bank holidays or mechanical breakdowns.

2.2.12 Any odours generated from the building may be released when the doors are opened to allow ingress/egress of waste delivery vehicles or when vehicles exit the building to take waste off site. Odours may also be released from other access and personnel doors associated with adjacent areas of the building. Other potential odour emission points include gaps in the building infrastructure that may be associated with ventilation, services entering the building or result from structural defect of damage.

2.3 Mechanical Treatment

Source Characterisation

The wastes subject to mechanical treatment are likely to have a similar odour generation potential at this point when compared to its initial delivery to the site, due to the predicted short storage time in the reception area. A summary of how the waste treatment activities might influence the odour potential of specific waste streams is detailed in Table 3.

Table 3.Odour Potential of Waste Streams during Treatment

Waste Stream	Treatment Activity		
	Size reduction in Shredder	**Separation via conveyor in Eddy Current Separator**	**Fines Generation**
C&I Residual Putrescible	**High** Shredding action maximised potential for odorous components to be mobilised into the air Mixing odorous / non-odorous waste may reduce MSW odour potential by dilution or absorption of odorous liquids into dry waste	**Medium / High** Potentially odorous compounds may be mobilised from shredded waste in eddy separator. Odorous waste may get mixed with low odour waste reducing the overall odour potential Aeration of waste may dry it and reduce odour release potential	**High** Generally non-odorous recoverable material removed from stockpile. If stockpile of fines grows too large or retained for excessively long periods, anaerobic conditions may develop and create significant odour potential
C&I Non-Putrescible	**Low** If not mixed with odorous waste	**Low** If not mixed with odorous waste	**Low** Majority of residual material likely to be recovered as RDF or recycled and unlikely to contribute to quantity of odorous fines

2.3.1 Wheeled loading shovels operating within the building will load waste from the reception area onto a centrally located shredder. The shredded material would then be deposited within the western quadrant of the building. This processed waste would, at this stage, be referred to as Refuse Derived Fuel (RDF) or waste derived fuel which will be loaded in loose form into HGV and removed for

recovery purposes. All separated ferrous and non-ferrous metals attracted would be stored in separate storage bays adjacent to the conveyor and be removed for recycling. Any fines materials resulting from the process will be removed from site for recovery or disposal.

2.3.2 Mixed C & I waste will be loaded onto the covered manual picking conveyor for physical separation of wood, plastics, cardboard and rubble materials. These non-putrescible materials will be stored in designated enclosed bays prior to removal from site for recovery purposes.

2.3.3 The mechanical processing of the waste may allow increased odour emissions resulting from increased surface area and splitting of previously sealed bags and shredding materials. The initial shredding and bag splitting processes are likely to generate the most significant odour during the mechanical treatment process.

Potential Release Points

2.3.4 It is not proposed to install any physical full height separation between the mechanical treatment area, reception area and product storage area. The potential release points are identified as the main vehicle access doors and associated personnel doors to the reception area, treatment area and product storage area.

Controls

2.3.5 Control systems and management controls relating to mechanical waste treatment are discussed in Section 3 below.

2.4 Storage of Products and Processed Wastes

Source Characterisation

2.4.1 Further to the screening and processing of the received materials, stockpiles of RDF, segregated metals and residual fines from mechanical separation process will be stored within the building awaiting transportation. A summary of how the waste treatment activities might influence the odour potential of specific waste streams is detailed in Table 4.

Table 4.Odour Potential of Waste Streams after Treatment

Waste Stream	Deposit of separated materials into HGVs	Transit of HGVs from building and off site
C&I derived fines	**Low / Medium** Disturbance of fines stockpile from MSW may result in odorous emissions if the stockpile has built up over long periods of time, however, fines material tends to be from non-putrescible source. Fines stockpile will be removed when there is sufficient material to fill a HGV, usually within 24 hours but no longer than 72 hours since last cleared.	**Low** All material loaded into HGVs and sheeted / covered when the vehicle leaves the building

RDF	**Low** Light material (plastics, paper) should have low odour potential as dry material.	**Low** All material loaded into HGVs and sheeted / covered when the vehicle leaves the building

2.4.2 The RDF materials will be stored in stockpiles within the building prior to loading into a HGV. This material has the potential to produce odour, however a significant proportion of the putrescible content will be removed by the mechanical treatment process. In addition, the moisture content of the material will have been reduced through processing and evaporative losses. As such, there is the potential for the generation of odour.

2.4.3 Residues from the screening undertaken inside the building include inert fine material may potentially contain putrescible components from resulting from the processing of MSW. The accumulated fines material will be removed from site when there is sufficient volume to fill a HGV but all stockpiles will be normally be removed within 24 hours but no later than 72 hours of the previous stockpile being cleared. Any waste stockpile containing a high proportion of putrescible wastes will be identified and its removal expedited.

2.4.4 The separated metals, wood and hardcore stockpiles are not considered to present a significant odour risk due to the low putrescible content of the waste.

Potential Release Points

2.4.5 The treated materials are stored within the building and, as such, are open to release odour into the atmosphere. Odours from the building may be released when the doors are opened to allow ingress/egress of waste delivery vehicles or when vehicles exit the building to take waste off site. Odours may also be released from other access and personnel doors associated with adjacent areas of the building. Other potential odour emission points include gaps in the building infrastructure that may be associated with ventilation, services entering the building or result from structural defect of damage.

Controls

2.4.6 Control systems and management controls relating to waste receipt and storage are addressed in Section 3 of this management plan.

3 ODOUR MANAGEMENT AND CONTROL

3.1 Waste Receipt, Storage and Treatment

Receipt

3.1.1 Control of incoming wastes will be managed according to the operator's site management systems and waste acceptance procedures. The waste acceptance protocols aim to identify malodourous waste which will be rejected and redirected to a suitable facility for alternative treatment or disposal.

3.1.2 Every effort will be made to identify malodours waste prior to delivery to site. All incoming loads will be weighed at the weighbridge and the appropriate waste acceptance procedures undertaken. Records of received wastes will be made and retained, appropriate documentation in accordance with the Duty of Care Regulations will be completed. The following records will be retained for each load of waste delivered:

- Date and time of delivery
- Vehicle details (registration)
- Description (including any associated strong odours);
- Origin (if known)
- Quantity

3.1.3 The waste acceptance protocols aim to identify malodourous waste which will be rejected and redirected to a suitable facility for alternative treatment or disposal. A waste acceptance check will be undertaken at the weighbridge with an additional visual check being undertaken at the point of discharge and during the processing of the waste. If the document checks at the weighbridge show that the wastes are not permitted, the load will be rejected.

3.1.4 After passing over the weighbridge, all waste delivery vehicles will discharge waste into the waste reception building. Any non-conforming wastes identified following deposit will be placed in a quarantine area (see Site Layout Plan) pending removal from the site to a suitable permitted facility. This will be actioned as soon as is practicable ideally within 24 hours but no later than 72 hours after receipt.

3.1.5 A record will be made of wastes found not to be permitted this may include: waste type, deliverer, date of receipt and the producer. Following rejection, the operator will inform NRW and direct the waste for alternative treatment or disposal. Actions will be undertaken to identify the origin of the waste and site management system reviewed to prevent re-occurrence of the issue. Any associated odour issues will be addressed as soon as practicable.

3.1.6 Operations staff will be vigilant for malodorous wastes and daily olfactory odour checks will be undertaken as detailed in Section 6.2 below. Doors will be checked daily to ensure effective operation and building infrastructure will be

checked daily for integrity. Daily checks will be made of the waste stored in the building, which will consider odour, storage time and stockpile size. Procedures will be employed so that stockpile age can be determined and to allow the oldest wastes to be treated in advance of the more recent deposits should odour issues be identified.

3.1.7 The site will be subjected to a strict housekeeping regime which assists with the aim of proactive management and associated environmental compliance. Daily inspections will be undertaken into the fabric of the development, as well as operational practices which will be controlled by the Environmental Management System. Daily checks are reinforced and supported by weekly supervisor and monthly manager inspections. All damage and faults are to be reported to the Site manager for action.

3.1.8 Routine cleansing of the relevant areas of the site, such as waste storage bays and receptacles will be undertaken at appropriate frequencies (weekly). These will be arranged to ensure there is no disruption to the continuity of operations. Given that the cleanliness of site forms part of our daily, weekly and monthly inspections cleaning will be undertaken as required, but monthly as a minimum.

3.1.9 In addition to the above, staff will be instructed to ensure that all external areas of the site are clear of any litter or other wastes.

Treatment

3.1.10 Controls relating to the receipt of waste as detailed above will reduce the risk of excessively odorous materials entering the treatment process of the facility. However, staff will remain vigilant for malodourous waste within the treatment process at each stage. Any malodourous waste noted within the treatment process will be identified and if possible removed from the output stockpile prior to removal from site.

3.1.11 Routine inspections and cleaning of the shredding and sorting equipment on site will be undertaken in order to identify and remove potentially odorous materials.

Storage

3.1.12 The proposed storage capacity of wastes prior to treatment allows for the storage of up to 5 days of waste delivery, however it is likely wastes will not be retained in the reception area for longer than 72 hours maximum to allow for mechanical breakdown or bank holidays. The mechanical treatment line will have a capacity that will allow the treatment of the maximum daily delivered tonnage within the planned daily operational period. Therefore the facility will have capacity to treat all delivered waste each day whilst providing for down time (e.g. maintenance / breakdown). Should plant maintenance or repair be required, any stockpiled waste will be treated on the basis to take account of odour generation potential this is likely to result in the oldest waste being treated first. The maximum storage time for wastes prior to treatment will be 72 hours. If wastes stored on-site prior to treatment present an excessive odour risk, contingency

measures will be implemented as detailed in Section 6.7 and 6.8 and the associated action plan in Table 3.

Evaporation Minimisation

3.1.13 Evaporation from warm wet waste may mobilise airborne odorous chemicals. Evaporative losses will be minimised by limiting total storage times to a maximum of 72 hours total, managing stockpile sizes and additional controls such as fine mist sprays may be used if deemed necessary. If necessary, a suppression system will be employed in specific areas on a risk based approach as required. Potential areas of deployment include stockpiled wastes in the reception area and mechanical processes identified as having a high odour generation potential. Excessive wetting down of the wastes will be avoided.

Air Management

3.1.14 The reception area may operate localised fine water sprays to reduce dust emissions and evaporative odour generation. The delivery doors to the reception hall will be kept closed when no access/egress is required. No further air treatment technologies or point source emissions are proposed for operation of the facility.

3.2 Drainage

3.2.1 Drainage infrastructure will be inspected, maintained and repaired as necessary. Routine maintenance includes flushing through pipework, checking the manhole chambers and interceptors and periodic emptying of the process water holding sump. Tanks and drainage infrastructure will be cleaned / jetted as necessary and no less frequently than annually in any case.

3.2.2 In the unlikely event that odour should become an issue as result of the onsite drainage system, a full review of the infrastructure will be conducted and cleaning and inspection frequencies adjusted accordingly.

4 ODOUR PATHWAY CHARACTERISATION

4.1 Overview

4.1.1 The principle mechanism for the transit of odorous emissions from site operations to adjacent sensitive receptors is via ambient air. The distance and direction that these emissions will be carried is determined by the following factors:

- Source Related Pathways;
- Meteorological Conditions; and
- Topography.

4.2 Source Related Pathways

4.2.1 The pathway an odorous emission takes from a site may depend on the specific source term and / or location it arises from. For example, odour arising from the tipping hall may follow a different route to that issuing from a bio-filter. The nature of the source related pathway could also influence the scale of the resulting impact on a sensitive receptor.

4.3 Meteorological Conditions

Wind Direction

4.3.1 The prevailing wind direction will determine which receptors will be affected and at what frequency

4.3.2 The main controlling factor in determining the pathway of odour is the ambient meteorological conditions. This is fundamental to the transportation of odour to sensitive receptors. The main controlling factor in determining the pathway of odour is the ambient meteorological conditions. This is fundamental to the transportation of odour to sensitive receptors.

Wind Velocity

4.3.3 Wind velocity will affect the distance an odour emission will travel. Conversely, increased wind speed could also beneficially improve dispersal. Those receptors closest to the installation are still at the highest risk of a negative impact however.

Air Temperature

4.3.4 Warm air may carry odours upwards by convection for their dispersal away from the site. However, warm weather will encourage the onset of biodegradation of exposed or temporarily stored wastes and therefore increase odour potential.

4.4 Adverse Weather Conditions

4.4.1 Unusual weather conditions may increase the risk of odour emissions from the site as existing countermeasures may not be as effective. Site staff will be vigilant to unusual trends in the meteorological data or forecasts which may

indicate strong winds or extremes of temperature which may cause a potential problem. The types of weather conditions that may impact on odour generation and emissions and appropriate contingency actions are detailed in section 5 below.

5 ODOUR RECEPTOR CHARACTERISATION

5.1 Identification of Receptors

5.1.1 Locally sensitive receptors can be characterised as follows:

- Domestic dwellings or workplaces;
- Public rights of way;
- Locally Sensitive Sites

Sensitivity of Receptors

5.1.2 The sensitivity of each receptor is based on the impact of unmitigated fugitive emissions to air (i.e. odour) from the facility. For example, a school or dwelling would have a high sensitivity, a retail showroom would have a medium sensitivity and a scrap yard or farm would be of a low sensitivity. This is determined by:

- Immediate locality (e.g. heavy industry or countryside);
- Frequency of receptor use or periods of occupancy;
- Who or what uses the receptor (children at school, wildlife in a SSSI);
- Any pollution contributed by the receptor itself.

Domestic Dwellings or Workplaces

5.1.3 There are both domestic dwellings and commercial/industrial premises within 1000m of the site and these are summarised below in Table 5. Locations of these receptors are also shown on the Sensitive Receptor Location Plan (ref: 2858/1/003).

Public Rights of Way

5.1.4 A number of public highways are located around the proposed site, the use of highways is transitory and as such human exposure to potential odours tends to be for short periods of time. A public footpath runs adjacent to the site along the western and northern boundary. The risk of odour to the users of adjacent public highways is considered to be low.

Locally Sensitive Sites

5.1.5 The site is located within an area which has been significantly altered by agriculture, historical and recent industrial development. The nearest sensitive sites are the Afon Seiont watercourse and SSSI, with the latter being located 1.8km distant.

Table 5. Sensitive Receptors

No.	Receptor	Category	Distance (m)	Direction from Site	Frequency Prevailing Wind Direction (%)
1	Industrial Units	Commercial / Industrial	20	W	7
2	Industrial Units	Commercial / Industrial	20	E	4
3	Industrial Units	Commercial / Industrial	20	N	11
4	Industrial Units	Industrial	25	S	1
5	Bodrual Holiday Cottages	Residential	230	ESE	3
6	Abattoir	Commercial / Industrial	200	S	1
7	Glan Gwna Holiday Park	Recreational	375	S	1
8	Redline Indoor Karting	Recreational	325	SW	6
9	Beacon Climbing Centre	Recreational	450	SW	6
10	Bryn Rhos	Residential	195	NW	11
11	Coed Mawr	Residential	425	NW	11
12	Houses A4086	Residential	450	WNW	10
13	Cae Garw	Residential	370	NNW	6
14	Commercial & Industrial Units	Commercial / Industrial	285	W	7
15	Afon Seiont	Watercourse	375	E	4
16	A4086 Llanberis Road	Highway	115	N	11
17	Afon Seiont SSSI	Designated Land	1800	W	7

* See Drawing No 2858/1/002: for location of receptors
*Wind direction information taken for the Caernarfon station from www.windfinder.com

6 COMMUNITY ENGAGEMENT, REPORTING & CONTINGENCIES

6.1 Overview

6.1.1 Prevention will be viewed as the most effective means of controlling odour before an impact occurs. The Source → Pathway → Receptor model determined above allows for the identification of the critical control points where odour can arise, how it can travel to a receptor and the likely impact.

6.1.2 It is intended the odour management system will mitigate any potential odour impacts of the installation on the identified receptors. Should complaints be received, a procedure will be in place to effectively deal with the issue in a sensitive, efficient and auditable manner.

6.1.3 The controls for each source term are detailed in previous sections of this report. The management of those controls will be based on the on-going monitoring regime at site. The monitoring regime can work as an early warning system to potential problems (e.g. meteorological monitoring) or a diagnostic tool to establish the cause of an odour event (e.g. perimeter monitoring).

6.2 Monitoring

Off-Site Olfactory

6.2.1 The Site Manager will be responsible for ensuring that regular inspections are made of the site and its perimeter in order to identify any sources of odour and to establish whether any odours are discernible. This will include odour arising from vehicles arriving at site and from the facility itself. Due to the potential for de-sensitisation to odours, odour monitoring will only be carried out by site personnel who do not work within facility building i.e. office or weighbridge staff. These personnel will be the most suitable to detect any fugitive odour outside the facility. Personnel nominated for odour monitoring will avoid entering the building except in an emergency or if they are wearing suitable face mask / respirators.

6.2.2 Off-site olfactory monitoring will also be carried out if required, with reference to the protocol in Appendix 1 of the H4 Technical Guidance Note, with an odour assessment form being completed. All site personnel will be responsible for reporting any odour problems immediately to the site manager or the next level of management if the manager is not available.

6.2.3 The following information will be recorded during each round of monitoring:

- Name of assessor and position at facility e.g. weighbridge clerk etc;
- Nature of any problem identified including location / source, date, time, duration, prevailing weather conditions and likely cause;
- Onsite activities and operational condition at the time of the monitoring visit (this should include any of the abnormal events detailed in Section 6.8 below);

- Records of the likely source of any odour even if it is not from the facility;
- Details on the corrective action taken, realistic timeframes for remedial works and any subsequent changes to monitoring and operational procedures.

6.2.4 The site manager will be informed immediately of any findings of odour attributed to the site and will authorise remedial measures to be taken.

Process Monitoring

6.2.5 Process monitoring is discussed in earlier sections of this report.

6.3 Complaints Process

6.3.1 Any complaints received at the Facility or via the Regulatory bodies including Natural Resources Wales (NRW) and Local Authority, will be recorded and will instigate further olfactory monitoring at the location of the complaint and on site to determine the extent and location of the odour, the odour causing materials and / or process itself. Where possible, as much information and detail about the complaint will be recorded, whether this is from the relevant authority or complaint direct to site. This information will assist in the investigation and determining the source of the odour.

6.3.2 All complaints and queries will be logged in accordance with the integrated management system as soon as in practicably possible. All complaints logged will be subject to investigation and complainants responded to within 48 hours of receipt. All responses will be through trained and experienced staff.

6.3.3 In the event that an odour complaint is received, additional monitoring will be undertaken at the nearest sensitive receptors. The person conducting the survey shall make note of any odours at each monitoring point including those not of obvious waste facility site origin.

6.3.4 Complaints regarding odour from the facility will be investigated in accordance with the protocol, and appropriate records maintained which may include:

- Complaints received including name and contact details of complainant (if known), and complainants description of the odour;
- Nature of problem including date, time, duration, prevailing weather conditions and cause of the problem;
- Onsite activities and operational condition at the time of the complaint;
- Records of the likely source of the odour even if it is clearly not from the facility;
- Details on the corrective action taken, and any subsequent changes to monitoring and operational procedures;
- NRW will proactively be informed by the operator of the complaint and the operator will confirm to the best of its knowledge the information described above.

6.3.5 The operator will ensure that the complainant has all the relevant contact details of the site (i.e. the Site Manager) and the officer responsible at NRW. The operator will be in regular contact with the complainant and NRW whilst the cause of the odour is being investigated and remediated.

6.3.6 An evaluation of the effectiveness of the techniques used will be carried out on completion of any remedial measures or if the complaints persist. Records of the above will be retained by site for future reference.

6.4 Means of Contact

6.4.1 The facility will be readily contactable to outside organisations and to members of the public. The site signage board (placed in a readily visible location) contains the necessary contact details for both the site operations and NRW. The company website also contains the necessary contact details for each individual site. Contact details are also made available through the local community liaison groups.

6.4.2 As part of the facility development, a community engagement plan will be fully developed, identifying all sensitive receptors and formulating a communications plan The community engagement plan will detail the complaints management and reporting procedures, to include, but not limited to:

- Immediate neighbours will be given information regarding the point and method of contact for the Facility in the event an odour has been detected or they want to discuss any activities at the Facility;
- The neighbours will be advised that any complaints / concerns will be addressed immediately following identification / notification and contingency action implemented; and
- The neighbours will be advised of any corrective action and a follow up call carried out if required.

6.5 Complaint Screening

6.5.1 As part of each odour complaint received, these will be objectively assessed against the wider environment to ensure that the source of the emission is traced back to the correct source. As discussed earlier in this OMP, it is essential that the source is correctly identified in order that mitigating measures can be applied effectively and correctly. The complaint will also be assessed against previous records to place the nature of the complaint into context.

6.5.2 If patterns in complaints emerge, community groups or individuals (subject to their agreement) will be called upon to act as an additional odour monitoring resource.

6.6 Complaint Investigation

6.6.1 In the event that odour is found to be causing a problem at the Facility, as determined and confirmed by investigation into off site complaints or during routine monitoring; measures will be taken to determine the source, and the following courses of action as detailed below shall be taken;

- Additional olfactory monitoring as detailed above to identify the extent of the plume and potential cause for the odour i.e. waste material and / or process activity;
- Examination of the operational activities at the Facility at the time of the odour complaint or odour identification;
- Examination of the meteorological conditions at the time of the complaint or odour identification;
- Carry out a review of the operational procedure and process controls and instigate any control measures immediately following identification of the problem; and
- Further olfactory monitoring will be carried out to ensure the issue has been addressed and to monitor the effectiveness of any control measures undertaken.

6.6.2 It is the operator's experience that complaints submitted to regulatory authorities can be made long after the actual odour event or delayed in their relay to the Permit holder for action, thereby making some investigations difficult due to the often transitory nature of odour or changing meteorological conditions. All complaints will be investigated, however, direct calls to site from complainants will allow for an immediate response and review.

6.7 Contingency and Emergency Plans

6.7.1 A contingency plan exists as part of the proposed alternative arrangements for the disposal and treatment of wastes should plant become inoperative in full or part for any significant length of time. These arrangements are not repeated in this section which considers contingencies relating to odour only.

6.7.2 In the event that odour is proven to be from the site and found to be causing a problem, as determined by the investigation of off-site complaints or during routine on-site monitoring, action will be taken to determine the source, and the following courses of action as detailed below shall be taken.

Malodorous Waste

6.7.3 It is deemed unlikely that the proposed wastes will be malodourous to such a degree that any particular waste cannot be accepted. However, if a particularly malodorous waste stream arrives on site it will be quarantined and sent for off-site disposal as soon as practical (ideally within 24 hours) and in any case no longer than 72 hours. The acceptance of the specific waste type will be put on hold pending further investigations.

6.8 Abnormal Events

6.8.1 The OMP assumes that the facility will be running under expected operational conditions. There are however a number of circumstances which that could result in an odorous emission from the site if not appropriately considered in advance.

Temperature Inversions

6.8.2 The conditions that can facilitate a temperature inversion (warm odorous air trapped beneath a layer of cold air under still conditions) can be predicted by simple regard to weather forecasts and/or the site meteorological data. If such conditions look possible, particular scrutiny will be given to ensuring that doors remain open for the minimal duration required. Olfactory monitoring (detailed in Section 6.3 above) will focus on the down-flow boundaries of the site to monitor for the early signs of low level odour movement.

Strong Winds

6.8.3 Wind pressure effects on the building from strong winds can induce positive pressure on the upwind side of a building and negative pressure on the downwind side.

6.8.4 The facility design will ensure the integrity of the building is maintained in all weather conditions. The external skin of the building is likely to comprise of a proprietary steel cladding construction with all joints and edges sealed by fasteners or other sealants where required for weather-proofing purposes. All openings for personnel access and egress will be provided with doors and all other openings for vehicular access will be provided with powered doors where regular/frequent access is required.

6.8.5 All penetrations to the building for process plant or mechanical and electrical services will also be sealed for weather-proofing and this will also prevent potential fugitive odour release via these pathways.

6.8.6 Daily visual inspection of the infrastructure will be undertaken and recorded. Additional inspection for damage resulting from high wind events will also be undertaken and contingency actions identified below considered should high wind conditions result in escape of likely escape of significant odours.

Snow / Ice

6.8.7 Severe cold weather may result in disruption to waste deliveries and removal of materials from site. Disruption to collection rounds may result in waste delivered to site that has been stored at the point of production for longer than anticipated. However the corresponding colder temperatures are likely to compensate for the increased storage time and result in waste with similar odour generation potential as would normally be expected. Inability to remove processed waste from site as a result of severe weather conditions is likely to coincide with the inability to deliver waste to the site. As a result the most likely scenario is a short term need to store processed waste. The storage plan for doing this is detailed in the tables below.

Hot Conditions

6.8.8 The warmer the waste the greater the potential to generate odour therefore an increase in ambient air temperature may result in increased odour from incoming wastes and wastes stored in the building. Daily inspections will be undertaken of the waste stored to ensure waste delivered to the site is processed as soon as practical and stockpiles of waste awaiting treatment are kept to an operational minimum. During prolonged periods of hot weather inspection frequency will be increased, the surface area of stored waste will be kept to a minimum and if any fixed dust/odour suppression sprays are installed, consideration may also be given to siting localised spray suppression on stored waste.

Power Failures

6.8.9 Power failures can have a negative impact on the operation of power doors and spray systems. In the event of a power cut notification will be completed and submitted to NRW. This will record the duration of the power failure, and if applicable, the management systems that were non-operational. If the power cut is attributed to a problem with the national supply, then the supplier will be notified as soon as possible. If the problem relates to issues with the electrical supply on the site premises, then a suitably qualified contractor will be brought onto site without delay to make necessary repairs or make appropriate replacements to relevant equipment.

6.8.10 Contingency actions for the both power failure and plant breakdown are identified in Table 6.

Table 6. Contingency Action Plan

ISSUE	PERIOD	MITIGATION PLAN
Facility not available as the delivery location. E.g. complete power failure / storage capacity full. Actions for waste deliveries	1 day	Direct deliver to alternative facility. Address mechanical failure issue
	Up to 72 hours	As above
	1 week	As above
	1 month	As above
	3 months or longer	Identify alternative long term delivery point – potentially temporary transfer station.
Facility not available as the delivery location E.g. complete power failure / storage capacity full. Actions for waste already on site	1 day	Contain waste on site within facility. i.e. delivery doors closed, remove processed wastes. Address mechanical failure
	Up to 48 hours	As above Risk assess odour generation and impact resulting from removal of waste compared to anticipated recommencement of operations.
	Up to 72 hours	Direct deliver to alternative facility. Address mechanical failure issue
	1 week / month	As above
	3 months or longer	Identify alternative long term delivery point.

ISSUE	PERIOD	MITIGATION PLAN
Facility available as delivery site but not for processing waste e.g. failure of mechanical sorting equipment	1 day – 3 days	Receive waste and store in building, capacity for storage of 5 days-worth of waste but limited to 3 days retention. Address mechanical failure issue
	1 month	Implement Medium term solution i.e. transfer to 3rd party for treatment and/or Transfer to other permitted facility.
	3 months or longer	Prioritise replacement of mechanical equipment to mitigate scale of impact
Off-taker not available for processed recyclate or RDF	1 day	Store material at facility
	Up to 72 hours	Store material utilising waste reception area
	1 week	Store material utilising waste reception area – does not apply to fines which will still be removed no later than 72 hours after previous batch
	1 month	Implement Medium term solution i.e. transfer to 3rd party for treatment, storage.
	3 months or longer	Implement Long term solution i.e. establish new off-taker.

Implementation of the Contingency Plan and/or Emergency Plan

6.8.11 Unscheduled unavailability should only take place due to unscheduled maintenance, emergency situations and for Health and Safety reasons such as a fire at the site. In such cases the plant staff will initially inform the plant manager who will in turn inform service managers, the Authority and NRW. Site staff will implement measures to store or divert wastes as required.

Operator's Experience with contingency/emergency situations

6.8.12 The operator is experienced in developing contingency plans for other long-term contracts which have worked effectively on previous occasions.

6.8.13 The operator has a policy of continuous review of emergency and contingency procedures and this has allowed experience from this incident to be used to improve procedures across the operator's operations.

6.8.14 The operator's experience in operating a significant number of waste facilities, together with managing complex long-term contracts offering similar services, means that the operator is able to offer the benefit of experience in and knowledge of logistical planning to ensure that service continues effectively with minimal disruption.

Review and Update of Contingency and Emergency Plans

6.8.15 The Contingency Plan and Emergency Plan will be reviewed following any incident where they have had to be followed. They will be updated as necessary with any lessons learned.

6.9 Records and Reviews

6.9.1 A daily record relating to the management and monitoring of odour will be maintained. It will include the following details:

- The results of inspections and olfactory monitoring carried out by installation personnel;
- Weather conditions including atmospheric pressure, wind speed and wind direction;
- Problems including date, time, duration, prevailing weather conditions and cause of the problem;
- Complaints received including address of complainant; and
- Details of the corrective action taken, and any subsequent changes to operational procedures.

6.9.2 The Odour Management Plan will be reviewed on an annual basis with the scheduled review of the Site Management System (SMS) or with every major decrease, or alteration to the odour generated at site (i.e. a change to odour source term, pathways or receptors).