JAMESON ROAD PHASE 2 LANDFILL SITE

ODOUR MANAGEMENT PLAN

Prepared by

S.J Environmental (Yorkshire) Ltd

On behalf of

Odour Management Plan

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1.0 INTRODUCTION

Odour Management Plan - Objectives

1.1 This Odour Management Plan (OMP) has been prepared by S.J. Environmental (Yorkshire) Limited on behalf of Transwaste Recycling & Aggregates Limited in respect of the ongoing landfill operations taking place at Jameson Road Landfill Site. This document details the methods by which Transwaste will systematically assess, reduce and prevent potentially odorous emissions from the Site in accordance with the requirements of Environment Permit reference EPR/BL9518IE.

1.2 The OMP provides an explicit list of 'appropriate measures' required for effective odour management and control and serves to aid the decision-making process on the choice of controls, general site design, and operational procedures in line with current industry best practice. The OMP is a working document and as such will be maintained under review with the specific aims of ensuring that:

- Environmental Permit Condition 3.3.1 is complied with;
- All potential odour sources are identified;
- Odour impact and potential impact is considered as part of routine inspections;
- Odour is primarily controlled at source by good operational practices, the correct use and maintenance of plant, and operator training;
- All appropriate measures are taken to prevent or, where that is not reasonably practicable, to minimise odorous emissions to air from the installation that may be considered offensive at locations outside of the installation boundary;
- Where reasonably practical, people outside of the site are not exposed to levels of odour that would result in annoyance;
- The risk of unplanned odour releasing incidents or accidents that would result in annoyance is minimised; and
- Site developments fully consider odour release potential and potential impacts from work undertaken.

1.3 The OMP has been compiled with specific regard to on-going waste operations at the Site and to the general operational management and development of the Site. When approved, this updated document will supersede all previous OMPs and will form part of Transwaste's integrated management system for the Site.

Key Reference Documents

1.4 The methodologies presented take into account Environment Agency (EA) guidance and other relevant industry documentation, as detailed below:

- EA Technical Guidance Note H4 Odour Management (March 2011)
- EA Internal Guidance for the Regulation of Odour at Waste Management Facilities (version 3.0)
- EA Guidance on Odour Management Plans for Waste Handling Facilities (v1.0, 2010)
- LFTGN 07: Guidance for Monitoring Landfill Gas Surface Emissions (v2, 2010)

- LFTGN 03: Guidance on the Management of Landfill Gas (v1, 2004)
- LFTGN 04: Guidance for Monitoring Trace Components in Landfill Gas (v3, 2010)
- Environment Agency Guidance for the Landfill Sector S5.02
- The Environmental Permitting (England and Wales) Regulations 2010
- Appendix 5: Application for an Environmental Permit Part B4 (April 2011)
- Regulating odour – a quick guide (163_12)
- Odour Regulation FAQ (Quick Guide 380_12)
- EA Guidance on How to comply with your environmental permit (v6, Document 433_11 June 2013)
- Sniffer ER31 Reports "Odour Monitoring and Control on Landfill Sites" and "Odour Management Plan report for Landfills"

In addition, this OMP should be read in conjunction with the following internal Transwaste management documents:

- Transwaste Jameson Road GMP v1 - 04.2024 (GMP)
- Site Environmental Management System – Please refer to Appendix 4 for relevant documents;
- Environmental Monitoring Procedure documents (as appropriate); and
- Further operating procedures are cross referenced as required.

2.0 SITE ENVIRONMENTAL SETTING

Installation Details

2.1 Jameson Road Landfill is located approximately 1.5 km south of Fleetwood in Lancashire and approximately 3 km north of the town of Thornton at National Grid Reference SD 335 460. The main vehicle access to the site is Jameson Road which leads off Fleetwood Road. The address of the landfill site is as follows: Jameson Road Landfill Site, Jameson Road, Fleetwood, Lancashire, FY7 8TW.

2.2 Jameson Road landfill site comprises two main landfill phases regulated under separate permissions. The larger (40 ha) Phase 1 occupies northern and western areas and was constructed as a dilute and disperse landfill on former pulverised fuel ash lagoons and salt marsh. Phase 2 occupies approximately 16 ha on the eastern side of the site. This was developed as a fully contained landfill site in accordance with the requirements of the landfill directive.

Pathway Assessment

2.3 The pathway by which odours may impact upon receptor locations is a result of atmospheric dispersion. In general, high wind speeds lead to emitted odour being rapidly dispersed and diluted due to turbulence, and low wind speeds inhibit the dilution of odours. A Windrose illustrating the breakdown of wind-speed and direction in the area is presented in Figure 1 below. As indicated, the predominant wind direction is from the south-west to west sector, winds from all other directions occur less frequently. Local weather data is also routinely recorded on a continuous monitoring basis by the Site's own on-site weather station.

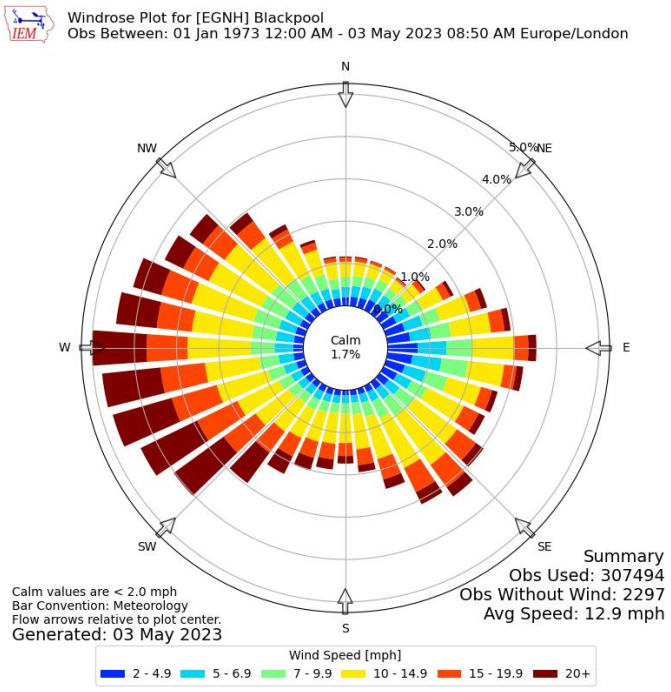


Figure 1: Windrose Blackpool Airport Meteorological Station

Potential Receptor Locations

2.4 Sensitive receptor locations for odour are defined as locations where people spend time and expect a reasonable level of amenity. Therefore, residential properties are regarded as the most sensitive locations, with recreational and commercial areas being of medium sensitivity.

2.5 The Site is located within a semi-rural setting, surrounded predominantly by areas of open space / land for agricultural purposes. The Site is accessed off the B5268, just off the A585 with the closest residential receptors located approximately half a mile to the West & North of the installation boundary and form part of the closest town or village, which is Fleetwood.

Residential receptors in the surrounding area within 1km, which are identified as sensitive off-site receptors with regards to any odorous emissions, are listed in Table 1 below.

Table 1 – Sensitive Residential Receptor Locations within 1km of Installation Boundary

Location	Distance from Installation Boundary (m)	Direction
Broadwater Avenue / Larkholme Avenue / Laurel Avenue / Maple Avenue	900	West
Windward Avenue / Voyager Close / Seacrest Avenue	900	North

Potential Impacts

2.6 It is the purpose of this OMP to ensure that the sensitive receptors identified in Table 1 above, do not perceive odour from the Site that causes an unacceptable impact upon amenity. However, Agency Guidance[2] requires assessment not only to address '*normal operation*', but to consider '*worst case emissions and exposure scenarios*'.

2.7 The likelihood and frequency of exposure to odour arising from the Site is determined by the magnitude of release, the prevailing meteorological conditions, and the distance and direction of receptors in relation to the Site. A qualitative assessment of the potential magnitude of impact at receptor locations is summarised in the following points;

- In the complete absence of effective mitigation all receptors within approximately 1km are likely to be at risk of potentially unacceptable odour exposure.
- Odour release scenarios involving fugitive release of landfill gas, as a result of either incorrect gas field balancing, problems with cap integrity (fissures, tears etc.) and gas plant or gas collection infrastructure technical issues are likely to result in high concentration, but medium volume (due to the manifold extraction system) releases. Releases of this nature are likely to result in unacceptable odour exposure beyond the site boundary, with the 'zone of influence' of odour exposure dependent on the wind direction and wind strength.
- Fugitive releases of landfill gas from inadequately sealed leachate wells and other infrastructure that penetrates the waste mass, has the potential to give rise to the escape of landfill gas and subsequently contribute to unacceptable odour exposure beyond the site boundary. Similarly, leaks in gas extraction infrastructure could result in a low to medium volume release.
- Odours from the received waste are considered low and of a reduced intensity in comparison to landfill gas. However, it is considered that odours generated at the active tipping face (where deposition of fresh waste is taking place) present a medium risk, considering the buffer distance (generally in excess of 500m). The development of the Site is such that landfill operations are progressively moving in the opposite direction away from the largest concentration of nearest residential receptors and therefore the separation distance between the active tipping face and residential receptors is increasing all the time.

- Mitigation at the Site incorporates measures to control odorous gas and odours arising from the reception and handling (deposition and compaction) of fresh waste. Levels of cover that have been applied to parts of the site that have not received fresh waste for more than 4 weeks are also monitored on a weekly basis to ensure that they remain sufficiently robust to prevent windblown litter and minimise short term surface odour emissions.

- Mitigation measures to address potential failures/remediation of landfill Site physical infrastructure (chambers, pipes and wells etc.), include regular inspection to assess the condition of the leachate wells and gas pipework with the aim of the early detection of gas leakage. If leakage is detected, repair/remedial works will be put in place to address identified issues.

[2] Environment Agency, Form Guidance EPB How to apply for an environmental permit Part B: New permit guidance notes, Appendix 10 – Guidance on Odour Management Plans

3.0 INSTALLATION DETAILS

Installation Details

3.1 Landfilling operations are permitted to continue until 31st December 2033 by virtue of Planning Permission ref. LCC/2018/0059 dated 18th December 2018.

3.2 Landfill operations are mostly complete within cells 1-5. Cell 6 is currently being engineered and landfill operations will move into this new cell shortly. Operations are progressively moving away from the western boundary of the site and future tipping will generally follow the principles of tipping in the lower areas during the winter months and higher levels in the summer months.

3.3 Material resources such as cohesive soils & clays are available within the site void to meet some of the future needs of the site engineering. It will be necessary to import volumes of clay in the future and there is also an identified potential shortfall in restoration soil making materials, which will need to be imported in significant quantities as areas of the site are permanently capped.

3.4 The site is engineered on the principle of containment and all cells are highly engineered to an agreed specification with the Environment Agency. The design, installation and capping of each cell is subject to Construction Quality Assurance (CQA) at every stage, with detailed validation reports submitted to the EA on a regular basis.

3.5 An active gas management system has been progressively installed at the Site. The gas collection system, which has expanded as the landfill has developed, carries gas to the landfill gas utilisation plant for electricity generation, which is exported to the local high voltage electricity network. Any gas that is not utilised in the engine generator sets is combusted in a high temperature flare. The gas plant is located to the southwest of the landfill site, at the rear of the site offices. All landfill gas operations, including the overseeing of new well installations, field balancing and engine management fall to Melton CLP, who have an engineer permanently based on the site.

3.6 An engineered leachate management, extraction and treatment system has also been progressively installed at the Site comprising a network of vertical sumps and remote monitoring points in each phase. Extracted leachate is transferred to the onsite treatment facility before being discharged directly to the the wastewater treatment works located adjacent to the site on Jameson Road.

3.7 The permitted operational hours of the Site are:

- Monday to Friday 0730-1730
- Saturday & Sunday 0800-16:00

4.0 LANDFILL ODOUR CONTROLS

Management Responsibility

4.1 In line with current best practice guidelines, the odour controls set out in the sections below will be used as the 'appropriate measures' to minimise and, wherever possible, prevent odour associated with the ongoing landfill operations at Jameson Road Phase 2 Landfill.

4.2 The Site Manager has responsibility for ensuring that odorous emissions arising from the installation are minimised. Adequate staffing levels will be maintained at all times to ensure the effective operation of the Site. The Site Manager is supported by an Operations Manager, an experienced Site Supervisor, Environmental Consultant and a team of operational staff who have a shared responsibility to carry out operations in a manner that maintains compliance with the Environmental Permit. A full-time resident engineer employed by Melton CLP, who manage the gas field and electricity production, also support the day-to-day operations at the site. Site meetings will be held at minimum monthly intervals for Site Management to discuss current and planned site operations with respect to their potential for generating odorous site emissions. Identified actions arising from the meetings and responsibilities for their completion will be recorded within the meeting minutes prior to circulation within the Transwaste Management Team.

Identification of Potential Odour Sources

4.3 In constructing robust, risk-based, management protocols for the site it is recognised that there are four primary potential odour sources associated with operations at Jameson Road Landfill site:

i. Odour from active waste disposal operations and the deposition of freshly tipped waste (Sections 4.4 – 4.12). The Site will potentially receive 3000-5000 tonnes per week of waste and the potential odour sources/activities are considered as follows:

- Receipt of odorous waste streams from other third-party waste sites or specific processes;
- The active tipping face in terms of how this is managed in the context of size and application of suitable cover materials; and
- The handling, storage and transportation of waste from the point of receipt to the point of deposition and subsequent compaction. This activity includes use of a dedicated tipping bay on site to allow for the unloading of wastes from waste carrier vehicles and reloading of wastes onto site vehicles for targeted deposition within the operational area.

ii. Odour from 'old' waste that may be released from drilling or over-tip operations (Section 4.13 – 4.14). Since opening for the receipt of waste, the Site has received approximately 2M cubic metres of material and potential odour sources/activities are as follows:

- The drilling of new or replacement landfill gas extraction wells. This operation has the potential to contribute to odour emissions in several ways. 'Old' waste, often extracted from near the base of the landfill, is brought to

the surface by drilling and has the potential to be odorous. Temporary disconnections of existing landfill gas collection infrastructure are also common when delivering long-term gas field improvements. This has the potential to temporarily cause increased emissions of landfill gas until the full gas field is re-established; and

- Tipping of previously landfilled areas has taken place at Jameson Road during the Winter of 2023. This temporary activity involved the stripping back of previously placed temporary cap to expose 'old' waste, followed by the infilling of additional waste to bring this part of the site up to the required contour levels. In this case the potential source of odour was the old waste itself, the associated direct surface emissions of landfill gas, temporary disconnections of the gas field required to access the area (as described above) and the placement of 'fresh' waste. Additionally, the drilling and installation of new gas collection infrastructure into this area in order to provide adequate gas capture was found to have released untapped pockets of landfill gas from within the 'old' waste beneath leading to a sharp rise in odour release and detection within, and away from, the site boundary.

iii. Landfill gas (LFG) is generated from the deposited waste at an approximate rate of 2500 cubic metres per hour and has odour potential from the following sources/activities:

- Escape of landfill gas under high pressure from sealed wells that have been temporarily disconnected to allow overtipping, earthworks or capping operations to take place;
- Passive venting of gas from the surface of the operational tipping face, landfill cells or flanks that are awaiting the application of a temporary or permanent cap;
- The accidental damage of landfill gas infrastructure though being impacted by site vehicles, or damage to collection infrastructure through the effects of settlement;
- Technical issues encountered at the landfill gas control compound, such as damage to collection infrastructure, plant failure or standby flare outage; and
- LFG emitted via leachate collection infrastructure, including wells.

iv. Leachate, if present on the surface of the site as a result of localised outbreaks, emissions from leachate collection infrastructure, or where leachate is transferred into the Leachate Treatment Plant (Sections 4.18 – 4.19).

These matters are addressed further in the relevant sections below together with a description of the Site's active odour control measures and protocols (Sections 4.19 – 4.23).

Waste Feedstock Inventory

4.4 Having due regard to the potential for waste feedstock material to be inherently odorous, key waste streams received at the site are detailed below. The odour potential associated with individual waste streams as received on-site under 'normal' operational conditions is also provided below. Determination of the odour potential of waste streams is based on subjective odour assessment and operational knowledge of the waste material properties.

For example, mixed municipal transfer station waste delivered to Site has a similar profile to direct delivered household waste. This waste can be highly variable in nature due to its composition and the length of time it has been stored prior to delivery to the Site.

Table 2 – Waste Feedstock Inventory

Waste Type	Odour Potential (Low, Moderate, High, Very High)
Mixed Municipal Waste delivered from Transfer Stations	High
Mixed Commercial and Industrial Waste delivered from Transfer Stations	Moderate
Screenings & Fines from mixed Commercial & Industrial Waste delivered from Transfer Stations	Moderate
Screenings & Fines from inert Construction & Demolition wastes delivered from Transfer Stations	Low
Inert Soils and Stones from excavation works	Low

The potential for the above general waste types to generate odour will be maintained under constant review by the Management Team who will also take into consideration seasonal variability, where appropriate.

Transwaste is proactive in ensuring that received waste streams exhibit as little odour as practicable. Before wastes are accepted at Site for disposal, pre-characterisation and assessment checks are carried out. Depending on the waste types, these checks include chemical analysis of the waste, photographs, description of the process giving rise to the waste, consideration of holding times pre-delivery to the Site and site visits. The Site Manager maintains a file of waste assessment checks that have been carried out and this process is reviewed regularly to ensure it remains fit for purpose. This proactive approach will continue for the remaining life of the Site.

Waste Storage and Transport

4.5 It is recognised that the waste feedstock odour potential set out in Table 2 above, may be significantly affected by the age of the waste when it is received at the Site. Where odour issues are identified, the Site Manager will liaise with the waste producers and transport contractors to minimise the storage and transport periods to the shortest practicable period, prior to waste being delivered to the Site. In cases where the Site Manager does not receive the required assurances, or the customer is unable to modify their practices, Transwaste will make a decision as to its future ability to accept such waste streams.

Disposal of Potentially Higher Odour Risk Waste Streams

4.6 Details of each load are logged by the weighbridge operator and, where wastes are received at the site with a 'high' odour potential (as set out in Table 2 above), the weighbridge operator will advise the plant operatives of the arrival of such waste so that appropriate preparations can be made to receive the waste at the operational area. Such measures will include the immediate 'deep burial' of waste with odour potential that is pre-booked, and the deposition of waste in front of the working face and prior to covering immediately with other non-malodorous waste materials. Where possible, this activity will take place during periods of favourable weather conditions. Where this is not possible, the time period from waste deposition to the application of cover of non-odorous waste will be minimised. No waste streams identified as having a 'high' odour potential will be tipped within the tipping bay at any time.

Management of Particularly Odorous Waste Streams

4.7 In the event an existing or new waste stream is identified as being of a highly odorous nature and considered likely to cause prolonged nuisance at locations beyond the Site boundary, the waste will not be accepted at the Site. This assessment will be made based on a subjective review by the site management of any new waste stream's odour potential prior to receipt at the Site i.e., the waste assessment process described above. Routine odour surveys undertaken in and around the Site boundary will also inform site management of any odour nuisance caused by specific waste streams (see Section 5, below).

Temporary Relocation of Tipping Area

4.8 The Site Manager will review at minimum daily intervals current and planned site operations with respect to their potential for generating odorous Site emissions. Where possible, temporary relocation of the active tipping face to an area further away from off-site potentially sensitive receptors will be considered by the Site Manager based on the following information:

- Potential seasonal sensitivities
- Forecasted meteorological conditions
- Subjective odour survey results
- Validated complaints data

The shape and depth of Jameson Road Phase 2 Landfill Site does mean that during certain phases of the development of the Site, relocation of the tipping face will not be feasible. However, current engineering operations in the base of the site will mean that more operational flexibility will exist in the future to move the active tipping face around to accommodate waste types and prevailing climatic conditions.

Plant and Equipment

4.9 The Site Manager will ensure that sufficient plant and equipment is maintained and deployed onto the operational area of the landfill to adequately place, compact, and cover all delivered waste in a progressive manner. Waste types that exhibit high odour potential will be compacted and buried as soon as practicable after being tipped. Other waste types with less odour emitting potential would be covered progressively during the day. All such covering shall be carried out such that the tipping area is covered to a satisfactory level by the end of each working shift in line with the Environmental Permit

requirements.

Compaction of Waste

4.10 The progressive compaction of the waste during the working day using mobile compaction equipment will be used to assist in the prevention of odours. The active area and tipping face size will reflect operational requirements and will be minimised to an area typically 30m by 30m in size to reduce the pathway for odorous emissions.

Application of Daily Cover

4.11 The Site Manager will ensure that there are adequate supplies of daily cover material available at the installation. A layer of cover material (soils, inert material, suitable fines etc) will be applied to the deposited waste in a progressive manner throughout the day in order to ensure the waste is adequately covered at the end of each working day. Progressive in this sense means that as the waste is tipped in lifts it will be covered over, both during the course of the day as operations advance to maintain the tipping face to the above size, and at the end of the working day when the entire tipping face will be covered.

The integrity of daily cover will be routinely inspected and maintained where required at the direction of the Site Manager, such that a nominal depth of 150mm of cover will be used. The purpose of daily cover is to prevent access to the underlying deposited waste by scavenging birds and vermin, together with minimising local odour releases and preventing windblown litter.

Cover inspections will also take place on a weekly basis on areas that have not been tipped for a period of 4 weeks or more. Where cover depth has been reduced due to weather or vehicle tracking, additional cover will be added within 5 days to ensure that the depth of 150mm is maintained.

The nature of the operations at the site ensures that there are always sufficient quantities of cover available. Cover is imported on a daily basis by contractors, it is also stored on site and in the unlikely event that imported material supplies become depleted for a period of time, soils, spoil and clay are in abundant supply within the void area.

Progressive Capping of Completed Areas

4.12 Completed areas of the Site will be capped with an engineered HDPE liner as soon as practicably possible upon the cessation of waste infilling in any cell. The HDPE capping may comprise either temporary or permanent low permeability capping systems as directed by the Site Manager and site development team. Such temporary works may include internal flanks, where it may be a prolonged period of time before waste will be deposited against them (works previously completed for Cells 1 & 5 internal flanks). Attention will be paid to the timely placement of capping/cover systems across finished profiles of waste and exposed internal flanks, such that these are programmed as far as is reasonably practicable to take place during the first available fine weather window after completion.

Areas of the site which are not at final levels, and which will not be covered with other waste for a period of three months or more, are covered with up to 0.5m of compacted inert material to provide a temporary cap. The temporary cap will be removed prior to the recommencement of landfilling operations in the area.

Minimising Disturbance to Previously Emplaced Waste

4.13 Measures will be taken to ensure that disturbance, exposure and movement of previously emplaced waste is avoided, or minimised wherever possible. In the event that previously placed waste must be disturbed, a mobile odour management system containing a neutralising agent may be utilised at this location, in addition to any other sensitive areas of the installation.

Where practicable, consideration will be given to the prevailing weather conditions when undertaking such activities in order to minimise any potential off-site odour impact.

Planned Temporary Odorous Activities

4.14 If it is necessary to undertake planned temporary actions that have an associated high risk of significant off-site odour impact such as in-waste gas or leachate well installation, the Site Manager will contact the Environment Agency and Planning Authority before such actions are taken to advise of:

- the operation being undertaken
- the reasons(s) for doing so
- planned additional odour mitigation measures
- timescales for completion

Where practicable, consideration will be given to the prevailing weather conditions when undertaking such activities in order to minimise any potential off-site odour impact. 'Unplanned' temporary odorous activities (e.g. in the event of a Site emergency) will be addressed immediately in accordance with the Action Plan set out in Section 6.2 below.

Landfill Gas Infrastructure

4.15 As capping and restoration progresses across the Site, the existing active gas abstraction network will be protected and maintained and will continue to be operated in accordance with the site Gas Management Plan in order to maintain gas control. In addition, during the active landfilling of waste cells, consideration will also be given to the installation of pin and/or horizontal gas wells of a sacrificial nature that would serve to extract gas from parts of the Site that may not otherwise receive coverage and connection to the network for a prolonged period of time. The installation of wells within the active waste tipping area should reduce the potential for surface gas emissions.

Disruption to the normal operation of in-waste gas abstraction infrastructure associated with restoration activities will be limited wherever practicably possible. The frequency of routine gas field balancing and inspection will be increased as required. As stated above, the Site benefits from a full-time resident landfill gas engineer and therefore the performance of the gas collection system, engines and emissions is part of the daily management of the Site.

The gas collection network will be connected to the on-site gas compound for flaring and/or energy production. Additional gas abstraction infrastructure will be installed progressively across completed areas of the site as soon as practicably possible prior to

or, where necessary, following completion of the cap emplacement. The need for any retro drilling of wells across previously drilled areas will also be maintained under review. The depth of the emplaced waste at the Site means that the action of differential settlement could cause wells to deform and therefore lose collection efficiency. The performance of the gas field is the subject of constant review and therefore any loss of efficiency will be readily detected, investigated and rectified as appropriate.

The historical development of the Site has resulted in the creation of steep flanks and sidewalls that could be left for prolonged periods of time, whilst adjacent cells are bought up to level. Such flanks have been shown through surface emission surveys to contribute to passive gas emissions at the Site. To minimise such emissions going forward, flanks will be constructed to ensure that adequate cover/temporary capping is capable of being applied and that access is maintained for drilling equipment to install any necessary gas extraction wells.

Landfill Gas Management

4.16 Landfill gas management will be undertaken in accordance with the current Gas Management Plan. To maintain control of in-waste gas, the gas treatment systems work on a flare-led basis, which ensures that the level of gas extraction from the Site is not impacted by the engines coming on and offline and/or any alteration in the load. The flare automatically treats any gas that the engine(s) would have otherwise used, thus ensuring that the maximum sustainable flow from the site is maintained at all times.

Gas Field Maintenance

4.17 The gas field is maintained in accordance with the current Gas Management Plan (Section 5.3), with the infrastructure being assessed for defects visually whilst balancing the field and/or manifold.

Any works required to be undertaken on the gas field at the site will be undertaken in accordance with the relevant procedures as set out in the GMP. Where such works are undertaken, a daily record will be made at the end of each working day to ensure that all elements of the gas system that have been worked on have been reconnected to the gas system or have been sealed to prevent the emission of gas odour until such time that reconnection can be made. The Site Manager retains the responsibility to ensure that all potential sources of odour have been minimised.

In Waste Leachate Extraction Systems

4.18 All leachate abstraction and monitoring infrastructure will be adequately sealed and will be connected to the gas abstraction system (where appropriate) to prevent any potential for fugitive odour release. Routine checks will be undertaken by the site management team to ensure that the leachate wells remain sealed and under adequate extraction from the gas collection system.

Leachate Storage & Treatment

4.19 Leachate at the site is stored and treated within dedicated tanks located within the leachate treatment plant. The tanks form part of a bespoke treatment system that

biologically treats the leachate generated at site prior to being discharged directly to the adjacent wastewater treatment works on Jameson Road. The balance of the leachate on the Site is contained within the waste, where it resides until pumped out and carried to the leachate treatment plant via a series of sealed pipes.

Plant Maintenance

4.20 Site infrastructure and plant will be inspected for damage and wear by the Site Manager or appointed responsible person at a minimum weekly frequency. Records of these checks will be maintained in the site log. All plant and equipment will be maintained in good working order and in accordance with the supplier or manufacturer's recommendations.

Training

4.21 Operational staff at the Site has knowledge and experience of odour and olfactory monitoring. As part of its commitment to development, Transwaste is currently reviewing the ongoing training needs for key staff.

Community Liaison

4.22 Site contact details and emergency (out-of-hours) numbers are shown on the site entrance gate. Direct feedback to site is encouraged at all times in relation any perceived issues associated with operational activities.

Site Emergency

4.23 This section details the emergency actions that would be undertaken and fall under the responsibility of the Site Manager in case of accidents (or incidents), which could result in the loss of control of odorous substances and could have an unacceptable short-term impact on the local community.

Severe Damage to Gas Containment and Extraction System

Emergency Action Plans are detailed within the GMP (Section 4.4 & 4.5 and Appendix A Section 5) for incidents or accidents that result in severe damage to the gas containment and extraction system, the GMP should be referred to for detailed procedures.

The key points relate to:

- Ensuring adequate supply of capping materials are stored on site to provide short term repairs to damaged capping;
- Ensuring sufficient spares and equipment is stored on site or available at short notice to undertake a short-term repair to gas extraction infrastructure until a permanent repair can be completed; and
- Ensuring either standby flares, or a temporary back-up flare can be mobilised in short notice.

The Environment Agency would be informed of any such an occurrence, information would be made available to local residents if requested by the Agency with regard to the measures being taken and the timescale to completion.

Subsurface Fire in the Waste

Emergency Action Plans are detailed within the GMP and EMS that provide procedures for handling sub-surface fires. With regard to management of odour impact, the key principles

are prompt responses that contain the fire and attempt to extinguish it, minimisation of damage to containment and extraction infrastructure and rebalancing of the gas field to maintain extraction in non-affected areas. Re-configuration of the collection network with additional pin wells may also be required.

The Environment Agency would be informed of any such an occurrence, information would be made available to local residents with regard to the measures being taken and the timescale for completion.

Landslip Resulting in Exposure of Waste

In the case of landslip, emergency action will include:

- Re-establish containment, i.e. additional soil cover/capping material over exposed waste;
- Rebalancing of gas field;
- Review of gas infrastructure, e.g. for requirement to supplement area with additional wells etc.

The Environment Agency would be informed of any such an occurrence, information would also be made available to local residents with regard to the measures being taken and the timescales for completion.

Failure of Leachate Containment

Details of emergency procedures to be initiated in case of a failure of containment of leachate are detailed in the EMS. With regard to mitigating the odour impact the most important measures to be implemented are:

- Initiate repair of containment system;
- Provide cover (e.g. daily cover) to minimise volatilisation of odorous organic compounds or if necessary, use of treatment chemicals (oxidising agents) to remove the odorous components of the leachate;
- Removal of leachate to a contained area (i.e. recirculation in a different cell), treatment plant or tankered off-site to a treatment facility.

The Environment Agency would be informed of any such an occurrence, information would be made available to local residents if requested by the Agency with regard to the measures being taken and the timescale to completion.

Site Flooding

Water ingress into the void is subject to a water management system for both contaminated and surface water run-off. The potential impact from flooding on the ability of the Site to control odour is therefore considered remote.

5.0 ODOUR MONITORING

Meteorological Conditions

5.1 An on-site meteorological station is correctly installed (i.e. at an appropriate location that is representative of air movements across the landfill area), calibrated and maintained in order to measure and record weather conditions (including atmospheric pressure, and wind speed and direction) at automated 30 minute intervals.

These data will enable potential odour issues to be predicted and necessary actions such as modifications to site operations or additional monitoring resources to be implemented.

In promoting proactive management of the risks arising at the site, the Site Manager will also obtain a weekly forecast of meteorological conditions for the site at the start of each working week. Details of the forecasted conditions will be assessed against proposed activities for the period and will be reviewed at minimum daily intervals. Key data to assist the Site Manager will be the assessment of wind speed, wind direction and potential atmospheric pressure changes.

In the event of failure of the Site based weather station, meteorological data will be procured from other commercial organisations such as http://www.xcweather.co.uk while the site's unit is re-instated/repaired. The target time for repair of the station is within 5 working days of identification of a fault relating to wind speed, wind direction or atmospheric pressure.

Regular Inspection/Olfactory Monitoring

5.2 A plan showing off-site and site boundary odour monitoring locations are included in Appendix 1 of this OMP.

All installation personnel are responsible for reporting any odour problems immediately to the Site Manager (or appropriate responsible person). Routine Site walkover inspections are completed by the Site Manager, or appointed Deputy, during the permitted operational hours of the site. Any observations and associated actions are recorded in the site log.

The Site Manager will also ensure that minimum daily inspections are made of the upwind and downwind installation boundary during operational periods in order to establish whether any odours are discernible. Additional routine weekly off-site surveys will also be undertaken at potentially sensitive off-site receptor locations (see Appendix 1 for offsite monitoring locations). Records will be maintained using the 'Odour Assessment Report Form' – see Appendix 2. The monitoring frequencies may be increased to reflect site activities and/or the perceived odour sensitivity at the site, as directed by the Site Manager.

All staff employed in atmospheric monitoring and odour monitoring are trained in the monitoring techniques and the methods used and in identifying potential odour sources. All staff are trained to recognise odour and are instructed to report to the technically competent management incidents which may result or do result in an odour emission.

Odour monitoring is undertaken within the site boundary during routine site inspections throughout the working day by various personnel.

A documented weekly odour monitoring assessment is undertaken outside the site, as well as upon receipt of an odour complaint. The monitoring is undertaken by observation at a selection of 9 pre-determined test locations, as shown below and on the plan located at Appendix 1:

Description	Direction from Site
Broadwater Holiday Park	SW
Bourne Road	S
Kilbane Street	W
Fleetwood Road	W
Brown's Lane	E

Windward Avenue	N
Acre Lane	NE
Pheasant Wood drive	S
LCC HWRC	W

Odour is recorded on a scaled system, by olfactory means, using a standard pro- forma (see Appendix 2). Meteorological conditions are also recorded. The inspection will be carried out in accordance with the following methodology:

The inspection will be undertaken as follows:

1. The monitoring officer will visit the specified site boundary and / or off-site odour monitoring locations.
2. The monitoring officer will stand still and breathe deeply facing upwind for a period up to 1 minute.
3. If odour is detected, but can only be detected in this manner, the odour 'intensity' should be recorded as 2 (faint). If odour is detected while walking or breathing normally, the intensity should be recorded as at least 3 (distinct).
4. The Site Manager or responsible person will be notified immediately of any detected odours that are considered to have the potential to give rise to significant off-site odour impact (odour intensity >3). This will trigger an immediate supplementary subjective odour survey at potentially sensitive off-site receptor locations - see Appendix 1.
5. If an odour is detected at off-site monitoring locations that are considered to be attributable to Jameson Road Landfill activities, a further on-site inspection will be carried out seeking to trace the odour plume back to source. The site investigation will incorporate detailed assessment of the site infrastructure and operational conditions against the specific requirements of the odour controls set out in Section 4, above, to determine any diversion away from 'normal' site operating conditions. The Site Manager will be informed so that the appropriate corrective and/or preventative action can be taken.
6. Following detection of any odour at site boundary or off-site locations that is not attributable to Transwaste's activities, the monitoring officer will attempt to trace back the odour plume in order to identify and record the third party odour source.

Observations including time, date, weather conditions, odour type, location, intensity, and extent will be recorded on the Odour Assessment report (Appendix 2), which will be maintained at the site office. Site operating conditions at the time of the survey will also be recorded.

Wherever possible, odour inspection personnel will be chosen from office-based staff that is unlikely to suffer from odour fatigue, *i.e.* the inability to detect relevant odours due to constant exposure. All staff responsible for assessing odour will complete documented training on the odour inspection procedure in addition to formal odour sensitivity and detection threshold assessments, as described in Section 4.22, above.

Monitoring of Landfill Gas and Leachate Infrastructure

5.3 Active management of the source term of odour at the site is essential to minimising the risks of odour being detected beyond the site boundary. Demonstrating the integrity and efficiency of the gas management and leachate collection system is essential and will be monitored in accordance with the site GMP. As outlined in Sections 4.15 – 4.17 above, this will include checks on gas management parameters, integrity of pipe work, and other infrastructure. Records will be maintained of any required remedial works,

timescales and responsibilities for their completion.

Additional FID monitoring of key on-site landfill gas and leachate management infrastructure will be completed at minimum annual intervals, weather permitting. In seeking to ensure all key elements of the site's infrastructure remain sealed, supplementary FID surveys may also be completed at the Site Manager and Melton CLP's discretion.

Monitoring of Gas Flares, Engines & Gas Wells

5.4 The efficiency of the gas flares and engines will be assessed at regular intervals in order to ensure that optimum combustion conditions are maintained in accordance with the site GMP. All sampling, monitoring and reporting will be carried out in accordance with Permit Condition 3.5.1 and Table S3.5, S3.6 and S3.7 by the Site Manager or their nominated technically competent representative. The management, efficient capture and combustion of landfill gas to produce electricity at the Site is a collaborative effort involving Transwaste and Melton CLP staff. Ensuring the efficacy of the landfill gas management system infrastructure is an integral part of the commercial viability of landfill gas utilisation at the Site and in turn minimises the fugitive emissions of landfill gas from the Site.

6.0 ODOUR ACTION PLAN

Odour Complaint Investigation

6.1 The following actions will be taken on receipt of an external odour complaint:

1. The responsible person receiving the complaint at the site will initially record the key details as follows using the Complaint Reporting Form, located at Appendix 3:

- Date/Time Complaint Received
- Date/Time of Complaint Event
- Complaint Received From: EA/Resident/EHO
- Name and Address of Complainant
- Telephone Number of Complainant (if available)
- Feedback Requested (Yes/No)
- Type of Complaint (e.g. odour, noise, litter, etc)
- Location of Incident (if not at Complainant's address)
- Complainants Description of the Incident (e.g. odour/noise type, extent of issue (localised/widespread), intensity [scale of 1 (very faint) to 6 (extremely strong)], duration constant or intermittent)

2. The Site Manager will be informed of the odour complaint as soon as possible, including the location, time and date of the complaint being lodged (where available). In recognising that odour can be transient and short-lived, timely notification of odour complaints directly from the complainant and/or the Environment Agency is imperative to allow for appropriate investigation. If the odour complaint occurs more than 12 hours before notification is provided to Transwaste, it will not be possible to fully investigate, or substantiate the complaint. Transwaste will, however, complete and record a comprehensive complaint investigation, as set out below, for all complaints received at the site.

3. If the complaint is received within 12 hours of the incident, the Site Manager (or appointed representative) will visit the complaint location as soon as possible in order to subjectively determine odour presence or absence. Opportunities to meet the complainant to discuss the matter directly will be pursued, wherever possible.

4. If an odour is present, the key *'FIDOR'* criteria will be assessed at the complaint location, as follows:

Frequency is the odour intermittent or persistent; is there a history of complaints at this location?
Intensity is the odour faint, moderate, strong, or very strong?
Duration how long is the odour present at this location?
Offensiveness provide a description of the odour; is it high, moderate, or low offensiveness?
Receptor Sensitivity is the odour present at a remote or highly sensitive location; is the odour plume localised or widespread?

5. The Site Manager will subsequently undertake the following further assessment process:

- Review of the site operations at the site prior to and at the time of the complaint;
- Review of the environmental control systems operative prior to and at the time of the complaint;
- Review of the meteorological conditions (wind speed/wind direction/rainfall/atmospheric pressure) prior to and at the time of the complaint – to establish whether a pathway can be established between the site and the complainant; and
- Review of the previous complaint history at the location identified.

6. The odour complaint will be substantiated (or otherwise) by the Site Manager in accordance with the following (in order of priority):

i. The Environment Agency has visited the complaint location and has provided confirmation that the odour exists, is significant, and is attributable to Jameson Road Landfill;
ii. The Site Manager has visited the complaint location and has provided confirmation that the odour exists, is significant (see FIDOR assessment, above), and is attributable to Jameson Road Landfill.

After completing the investigation, the Site Manager will contact the Environment Agency to discuss each complaint incident as soon as possible following receipt of the complaint details, allowing sufficient time for the above investigation to be completed. If the necessary contact details are available and direct feedback has been requested, Transwaste will also contact the complainant directly to discuss the issue, the findings of the subsequent investigation, and any actions arising.

In reflecting the complaints history at the site, Transwaste will submit a short factual summary response to the Environment Agency on the complaint(s) received during the review period at quarterly intervals, or such other timescale as agreed with the Environment Agency.

Action Plan

6.2 Odour 'non-conformances' may be determined at the site as follows:

- Receipt of an odour complaint that is attributable to site activities;
- Detection of significant/offensive odour beyond the site boundary during routine odour surveys;
- Damage to or failure of on-site odour control infrastructure

In the event that any of the above occurs, the following actions will be taken:

Responsible Person(s):

Transwaste's primary point of contact will be the Site Manager for the Site on all matters associated with site operations and environmental performance. In the absence of the Site Manager being available, the responsible person will be the Directors or the Site owners.

Actions:

1. The Site Manager will be informed.
2. Thereafter the Site Manager will co-ordinate with (where appropriate):

Externally: Environment Agency Officer

Note: Environment Agency notification will be provided by the Site Manager or Director without delay where the non-conformance is considered to be either high significance in terms of potential for off-site odour impact or where a Permit obligation exists (*e.g.* gas plant failure) and the Environment Agency are unaware of the non- conformance. Notification may also be provided to the EA as part of on-going weekly/monthly communications where the non-conformance is not considered to be of high significance.

Note: The Environment Agency will be notified by the Site Manager if the likelihood and potential significance of any incident is considered to be sufficiently high or may be sustained for an extended period. Details of actions and timescales for remediation will also be provided.

Internally: Melton CLP Site Based Engineer

Site Supervisor

Weighbridge Operator

Site Staff (Foreman etc.)

3. If the incident relates to receipt of an external complaint, an investigation will be completed in accordance with Section 6.1 above;

4. If not previously undertaken, the Site Manager or appropriate responsible person will undertake a site investigation in order to determine the likely cause(s) of the off- site odour. The site investigation will incorporate detailed and methodical assessment of the site infrastructure and operational conditions against the specific requirements of the odour controls set out in Section 4 above, to determine any diversion away from 'normal' site operating conditions.

5. Upon identification of the likely odour source(s), the appropriate corrective and preventative measures will be identified and implemented under the direction of the Site Manager. Additional support and technical expertise will be provided by internal and/or external technical specialists, as required. Where necessary, the OMP requirements will be reviewed in line with Section 7 below, in order to ensure they continue to represent 'all appropriate measures'.

Key items for routine consideration and assessment will be as follows:

Disturbed Waste

Where odorous emissions arise specifically from the exposure of previously emplaced waste, the exposed area will be covered and minimised as soon as practicably possible.

Inadequate Cover or Capping

If the area is awaiting the installation of the engineered capping layer, the programme for capping works will be reviewed by the site management in order to identify any requirement and potential for bringing the planned works forward.

Inadequate Gas Control

Remedial action could involve one or more of the following, as required:

- Installation of additional gas wells;
- Increase suction on wells and operate outside of the normal balancing philosophy;
- Use of a temporary mobile flare (if full suction is not available from the gas plant);
- A comprehensive audit on the gas system to ensure its integrity and effectiveness;
- Repairs to or replacement of any malfunctioning infrastructure, *e.g.* pipelines, wellheads KOPs;

Damage to the Gas Collection System

In the event that damage to the gas collection system is identified, the relevant GMP procedure will be followed and Melton CLP called upon to rectify the situation in consultation with the Site Manager.

Generator Trip

A generator trip will be indicated by an automated telemetry call to the on call Melton CLP engineer.

Gas Plant Trip

A gas plant trip will be indicated by an automated telemetry call to the on call member of the Area LFG Operations Team. GMP Procedures will be followed.

Leachate Wells/Monitoring Points

The following actions will be undertaken, as required:

- Additional seals will be applied to problematic wells and monitoring points;
- Additional suction will be applied to leachate wells and monitoring points where safe to do so (due to the increased risk of fire)

Timescales

6.3 In the event that it proves impracticable to carry out adequate remedial measures within one working day, the Site Manager will notify and agree with the Environment Agency the proposed actions and the timescales for their completion as a programme of works.

Records

6.4 Details of odour 'non-conformances' including subsequent investigations, timescales and remedial measures taken, and notifications of the relevant internal and external bodies will be recorded by the Site Manager. Analysis of the weather data recorded at the on-site meteorological station will also be noted in addition to the site operations at the time of the complaint, proximity and location of the complainant, assessment of other third party odour sources in the area, date and time, etc.

Identifiable trends in complaints will be assessed by the Site Manager, together with the assessment of the effectiveness of mitigation/control measures.

Additional Supportive Odour Monitoring

6.5 The requirement for (and frequency of) additional supportive odour monitoring will be agreed between the Site Manager and the Directors. This may include, but not be limited to:

- Additional on-site FID/subjective odour inspections;
- Additional site perimeter FID/subjective odour inspections;
- Additional off-site FID/subjective odour inspections; and
- Speciated trace volatile organic compound (VOC) sampling and analysis.

7.0 Document Audit and Review

Review Requirement and Timescale

7.1 The OMP will be formally reviewed at minimum annual intervals to ensure it continues to reflect the on-going site status and associated sensitivity/risk. Any required changes to the conditions set out within this document will be formally agreed with the Environment Agency prior to their implementation.

Review

7.2 The processes described in this document will be reviewed by Transwaste's Site Manager, support by external independent resource if required.

Review and Plan Update

7.3 This OMP sets out the appropriate measures Transwaste will undertake in controlling any odorous or potentially odorous activities from the facility. If, on review of the performance of the facility, Transwaste and/or the Environment Agency propose to seek revision of this plan, then the following course of action will be undertaken by both parties:

1. In potentially critical circumstances where Transwaste recognises the requirement for the immediate implementation of changes to the management plan to prevent or reduce significant odorous emissions, these changes will be discussed with the Environment Agency without delay but may be initiated by Transwaste ahead of securing formal agreement with the Environment Agency.

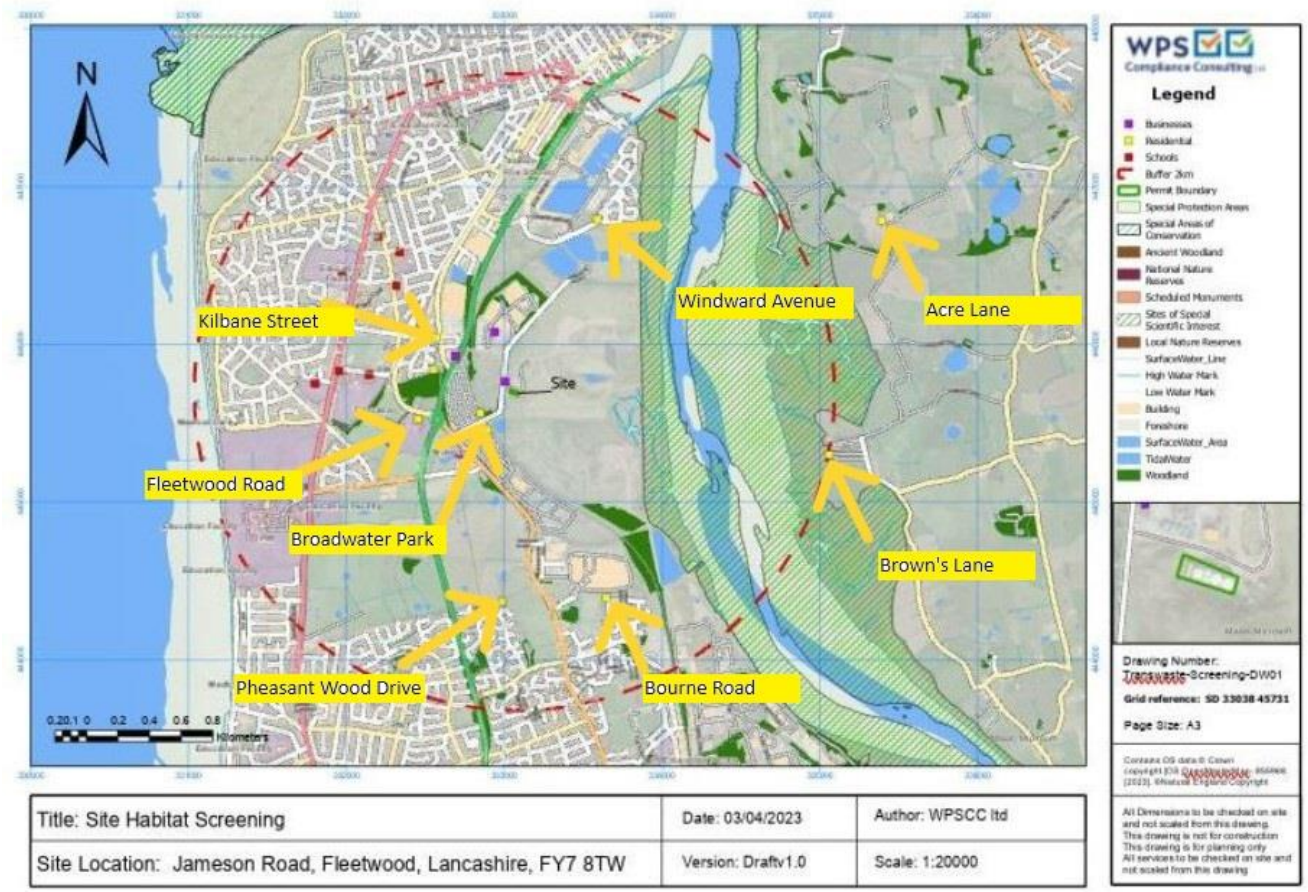
2. Where Transwaste proposes changes to the management plan that involve a more strategic and/or phased approach rather than a need for immediate implementation, a formal proposal will be submitted by Transwaste to the Environment Agency setting out the specific issues arising from document review, and the options/issues requiring Transwaste's further attention following Agency approval. The Environment Agency will review Transwaste's submission/updated management plan and confirm they are satisfied with the proposed changes. Where possible, the response should be within 28 days of receipt of Transwaste's submission. The agreed required changes will then form the future 'appropriate measures' for the Site with regard to odour management and control.

3. Where changes to the management plan are proposed by the Environment Agency, these will be discussed with Transwaste setting out the Environment Agency's clear expectation from the changes in addition to timescales for their implementation. It is recognised that these changes may range from matters that require immediate implementation to those that may be implemented over an extended timeframe. In each case, the required changes will be discussed with Transwaste and an appropriate action plan agreed. Transwaste will (wherever practicable and possible) undertake the identified changes in accordance with the timescales proposed for the work, at which point the updated 'appropriate measures' will take effect.

Appendix 1

Odour Monitoring Locations

Plan Identifying Location of Odour Monitoring Locations



Appendix 2

Odour Assessment Report Form

Odour Assessment Report

Date:		Time Start: Time Finish:				Monitored by:
Meteorological Conditions:		Temp (°C)	Wind Speed (mph)	Wind direction	Atmospheric Pressure (mb)	Precipitation (mm)
	Start:					
	Finish:					
Location & Time	Intensity		Extent		Sensitivity	Comments

Odour Assessment Report Key:

Intensity

0. No odour
1. Very faint odour
2. Faint odour
3. Distinct odour
4 Strong odour
5. Very strong odour
6. Extremely strong odour

Extent (assuming odour detectable, if not then 0)

1. Local and impersistent (only detected during brief periods when wind drops or blows)
2. Impersistent 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)

Sensitivity of location where odour detected (assuming odour detectable, if not then 0)

1. Remote (no housing, commercial/industrial premises of public area within 500 meters)
2. Low sensitivity (no housing, etc within 100 metres of area affected by odour)
3. Moderate sensitivity (housing, etc. within 100 metres of area affected by odour)
4. High sensitivity (housing, etc. within area affected by odour)
5. Extra sensitive (complaints arising from residents within area affected by odour

Appendix 3

Complaint Reporting Form

Complaint Reporting Form

1. Basic information	
Site reporting complaint:	Manager/supervisor reporting complaint:
Date/time complaint received:	Date form completed:

2. Nature of complaint and complainant details	
Name of complainant:	
Any contact details:	
Please outline below the nature of the complaint:	
Complaint received direct or via regulator (EA/SEPA/HSE etc)?	

3. Any additional information, circumstances etc
Please outline relevant additional information such as weather, is the complaint confirmed etc:

4. Actions and feedback
Please outline any action taken: