



Odour Management Plan for Mechanical Biological Treatment Operations at:

Southwark Integrated Waste Management Facility

For

Veolia ES Southwark Ltd

Prepared by:
Clare Russell

Approved by:
Ruth Dowd

Severn House
1-4 Fountain Court
Bradley Stoke
Bristol
BS32 4LA

Tel 01454 284450
Fax 01454 284499
Email ruth.dowd@rpsgroup.com

Revision: Issued
February 2009

This report has been produced by RPS within the terms of the contract with the client and taking account of the resources devoted to it by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk

RPS Planning and Development Ltd. Registered in England No. 02947164
Centurion Court, 85 Milton Park, Abingdon, Oxfordshire, OX14 4RY
A Member of the RPS Group Plc

Contents

1	Introduction	1
1.1	Objectives and Scope	1
1.2	Supporting Documents.....	2
2	Odour Management Plan Policy Statement.....	3
2.1	Policy Statement	3
3	Description of the Site and Processes.....	4
3.1	Site Overview	4
3.2	Site Process.....	4
3.3	Potential Odour Sources, Materials and Processes	6
4	Local Receptors	8
4.1	Receptor Identification Considerations.....	8
4.2	Identified Receptors.....	9
5	Operational and Process Controls.....	10
5.1	Odour Management Strategy	10
5.2	Operational Controls.....	11
6	Monitoring and Auditing.....	16
6.1	Odour Monitoring.....	16
6.2	Direct Monitoring of Emissions from known Potential Odour Sources.....	18
6.3	Site Odour Diary and Weather Monitoring	18
6.4	OMP Audits.....	19
7	Non Conformances and Potential Corrective Actions	20
7.1	Corrective Action Initiation.....	20
7.2	Complaint Odour Response and Investigation.....	20

8	Record Keeping.....	22
8.1	Record Keeping.....	22
8.2	Maintaining a Complaints Log	22
8.3	Communications	24
	Appendices	25
	Odour Descriptions	27
	Summary of General Odour Controls for Main Sources of Odour at MBT33	
	Odour Diary.....	35
	Weather Conditions Record	36

Appendices

Appendix A	List of Odour Descriptions
Appendix B	Odour Source Inventory
Appendix C	General Odour Control Techniques
Appendix D	Odour Diary and Weather Conditions Record
Appendix E	Complaints Form

1 Introduction

1.1 Objectives and Scope

- 1.1.1 This Odour Management Plan (OMP) provides information on the potential odour impacts from the MBT facility and the mitigation measures to be implemented. It does not apply to the rest of the Integrated Waste Management Facility (IWMF) as odour is not considered to be a significant issue for those activities. These measures will include operational and control measures for normal as well as abnormal conditions and can be linked to an Environmental Management System (EMS) and EMS risk assessments. Veolia ES Southwark Ltd will develop an EMS for the IWMF, which will be based on ISO 14001.
- 1.1.2 This OMP provides a management framework comprising proactive and reactive measures to manage and control potentially odorous releases from the MBT plant. This proactive approach will facilitate the development of operational procedures and controls as part of an ongoing commitment to improving environmental performance. Reactive procedures will also be established within the OMP for the logging, evaluation and implementation of corrective actions based upon external communications.
- 1.1.3 The scope of this report meets the Environment Agency's general requirements for OMPs as described in their draft Technical Guidance Note H4 and addresses the following issues:
- The materials and activity which produce the odour and the point(s) of odour release;
 - Identification of local sensitive receptors;
 - Process controls and procedures;
 - Monitoring and auditing of the operational controls and the monitoring of infrastructure;
 - Potential corrective actions; and
 - Record keeping

1.2 Supporting Documents

- 1.2.1 The OMP is supported by the procedures and controls established by the Quality Management System (QMS) and those of the EMS. The QMS is accredited to the ISO 9001:2002 internationally recognised standard and the EMS will be based on the ISO 14001:2004 standard.
- 1.2.2 In addition, standard operating procedures (SOPs) and safe systems of work will be developed to ensure safe and controlled operating conditions. These systems provide the overall framework for ensuring operational control and compliance with environmental legislation, permits, authorisations and the requirements of this OMP.

2 Odour Management Plan Policy Statement

2.1 Policy Statement

2.1.1 The Veolia ES Southwark Ltd Odour Management Plan policy statement is as follows:

- To seek continual improvement in environmental performance;
- To prevent the generation of odour where possible;
- To contain the odour and use effective treatment techniques, or other means of minimising emissions, where prevention is not possible;
- To keep exposure to odour at sensitive receptors below the level at which it would give reasonable cause for annoyance; and
- To promote the use of good practices for the control of odour, including adequate maintenance and cleaning, storage, containment etc

3 Description of the Site and Processes

3.1 Site Overview

- 3.1.1 The proposed IWMF will be located on the eastern part of the former gasworks in Bermondsey at NGR TQ 348 778. The former gasworks covers an area of approximately 11 ha (of which the proposed facility will accommodate approximately 5.7 ha). It is divided into operational and non-operational areas and still contains part of the gasworks infrastructure including gasholders and a number of storage tanks.
- 3.1.2 The site is currently occupied by a number of businesses including gas storage, a BT distribution warehouse, a car and coach park, building supply storage and a timber yard.
- 3.1.3 The MBT facility will be enclosed within a building, which will also contain the WTS. Household and street cleaning wastes will be delivered to the building, where they will be processed to recover materials such as metals and plastics, and the biodegradable component will be extracted for further processing within the MBT. All internal air from the MBT facility will be pumped to a biofilter plant (via a scrubber and humidifier) before being released via twin dispersion stacks, which will be located at the northern end of the building at a proposed height of 18m.
- 3.1.4 A summary of the process within the MBT facility is discussed below. A more detailed description of the process is provided in document JER7548 Technical Standards, RPS 2008.

3.2 Site Process

Waste Types and Inputs

- The MBT plant will process approximately 87,500 tpa of street cleansing and residual household waste.

Process

- 3.2.1 Waste will be taken to the processing hall where it will be pre-treated to mechanically segregate materials such as metals or plastics and other contaminants from the rest of the waste stream. Pre-treatment of the incoming waste comprises:
- Shredding
 - Screening to separate the waste into 3 different fractions;
 - Metal separation (via overbelt magnet and eddy current separator);
 - Paper and cardboard separation (using Near-Infrared (NIR) light separation and high pressure airflow).
- 3.2.2 The above pre-treatment process will leave a predominantly organic fraction, which is then fed into the next process. The material is conveyed into enclosed biodrying tunnels for 7 days and screened into 3 different fractions for biomass fuel production.
- 3.2.3 The biodrying will be carried out within multiple air-sealable tunnels with a network of aeration pipes laid in the underlying concrete floor. Water will be sprayed from the ceiling of the tunnels during the process. The whole process will be computer controlled allowing for the finite control of temperature, oxygen and moisture levels in order to maintain optimum aerobic conditions within the biostabilising material. The air supply will be set to a minimum of 60°C for 36 hours to allow hygienisation and then maintained at 50-55°C for 14 days during the biostabilisation phase.
- 3.2.4 The biological treatment of the waste will take place on a 24-hour basis, Monday to Sunday inclusive and will be computer controlled outside of working hours.
- 3.2.5 The material is then transferred to the refining and storage hall before being transported from the site in bulk.

3.3 Potential Odour Sources, Materials and Processes

Odour Types

- 3.3.1 Odour is a perceived response to the presence of chemicals in the air. Humans have a sensitive sense of smell and can detect odour even when chemicals are present in very low concentrations.
- 3.3.2 Odours are typically a mixture of chemicals that interact to produce what we detect as an odour. 'Fresh' air may also contain odours but they tend to be below the human detection limit or are pleasant to the senses. A list of odour descriptions is provided in Appendix A.
- 3.3.3 Individuals may have different responses to the same odorous compounds i.e. if they find it acceptable or objectionable and offensive. Perception of odour is also influenced by other senses such as sight and taste.

Odour Sources

- 3.3.4 In theory, there is the potential for odours to be released at each of the MBT process stages described above. However, in practice these odours can be broken down fairly rapidly by active aerobic bacteria. Effective management of the biostabilisation process can also minimise the generation of odours.
- 3.3.5 Odours from the biostabilisation process generally arise from three different sources, summarised below:
- *Odours present in fresh feedstock materials* – fresh feedstock materials naturally contain odorous compounds such as limonene from citrus fruits and pinene from woody materials, which are not considered unpleasant in the proper context, but will become unpleasant if putrefaction of food waste occurs.
 - *Odours produced through the normal breakdown process* – the initial stage of a biostabilisation process has the potential to generate the highest levels of odour. Strong odours are generated as a result of the breakdown of larger molecules into a series of intermediate breakdown products, many of which are odorous, such as amines

(fishy smell), hydrogen sulphide (rotten eggs), dimethyl sulphide, ammonia and fatty acids.

- *Odours produced if anaerobic conditions are allowed to develop* – a number of volatile fatty acids can be produced, e.g. butyric acid (sweaty smell), acetic acid (vinegar smell) and propionic acid, and sulphur-containing compounds such as hydrogen sulphide and mercaptans (skunk-like smell).

3.3.6 An Odour Source Inventory for the MBT facility is provided in Appendix B. It provides a summary of the main sources of odour, their locations and the materials/activities involved, and the characteristics of the odour sources (e.g. fugitive or controlled; point, area or volume; release height; and the likely odorous compounds). This inventory of sources will be maintained by Veolia ES Southwark Ltd.

3.3.7 Document JER7548 Technical Standards, RPS 2008 contains the in-depth description of processes and activities and should be consulted in relation to this OMP and the odour source inventory in Appendix B.

Release Points and Odour Pathways

3.3.8 An odour pathway is the route or means by which an odour is transferred from its source to a sensitive receptor. Whilst a number of potential odour sources have been identified from the different process stages, most are contained within the MBT building and this air will be continuously extracted to the odour treatment plant.

3.3.9 In addition to any fugitive odours escaping from incoming lorry loads of feedstock, the remaining potential sources of odour from the MBT process are:

- Residual releases discharged from the biofilter dispersion stacks, and
- Fugitive odours escaping from the entry and exit points from the building.

4 Local Receptors

4.1 Receptor Identification Considerations

4.1.1 The sensitivity of the receiving environment and the receptors have been considered within this OMP and will be taken into account in any odour assessments. The degree of sensitivity in a particular location is based on the characteristics of the land use, including the time of day and the reason why people are at the particular location (e.g. for work or recreation).

4.1.2 It is also important to study the concentration of odours and their frequency of occurrence. This approach is in accordance with recent guidance from the Environment Agency. The FIDOL Protocol outlines an objective methodology for the assessment of odour nuisance and is described below:

- FREQUENCY – how often an individual is exposed to odour;
- INTENSITY – the concentration of the odour (i.e. does it exceed a threshold or guideline);
- DURATION – the length of a particular odour event;
- OFFENSIVENESS – the nature or ‘hedonic tone’ of the odour, which may be pleasant, neutral or unpleasant; and
- LOCATION – the type of land use and nature of human activities (including background levels) in the vicinity of an odour source.

4.1.3 Different combinations of these factors can result in adverse effects, e.g. odours may occur frequently in short bursts, or for longer, less frequent periods. Depending on the severity of the odour event, one single occurrence may be sufficient to cause a significant adverse effect. However, in other situations the duration may be sufficiently low and the impact on neighbours sufficiently minor that the frequency of events would need to be higher before an adverse effect would be deemed to have occurred.

4.1.4 Other non-meteorological factors which influence odour concentrations include:

- Distance from the odour source – the closer the receptor is to an odour source the higher the odour concentration will be at that location;
- The height of release – generally, the higher the point of release the lower the odour concentration in the vicinity of the odour source;
- Emission characteristics – i.e. stronger odour sources will affect a larger area than weaker sources.

4.2 Identified Receptors

4.2.1 The site’s immediate surrounding environment is predominantly industrial. The identified receptors local to the MBT facility and the rest of the IW MF are illustrated in Table 4.1. The receptor list will be updated on a periodic basis.

Table 4.1 Identified Receptors

Receptor	Distance	Direction
Gas works	Adjacent	West
Various Works/Depot/Warehouse	2-100 m	East
Residential buildings and Ilderton Primary School	30m	North
Residential buildings and Pilgrims Way Primary School)	50m	South east
Works	150m	South

4.2.2 To the south of the site beyond Old Kent Road the majority of land is used for high-rise residential housing. There is also a Church and Camelot Primary School. Burgess Park is approximately 0.5 miles west of the site. Land uses between the east of the site and the mainline railway are almost exclusively industrial.

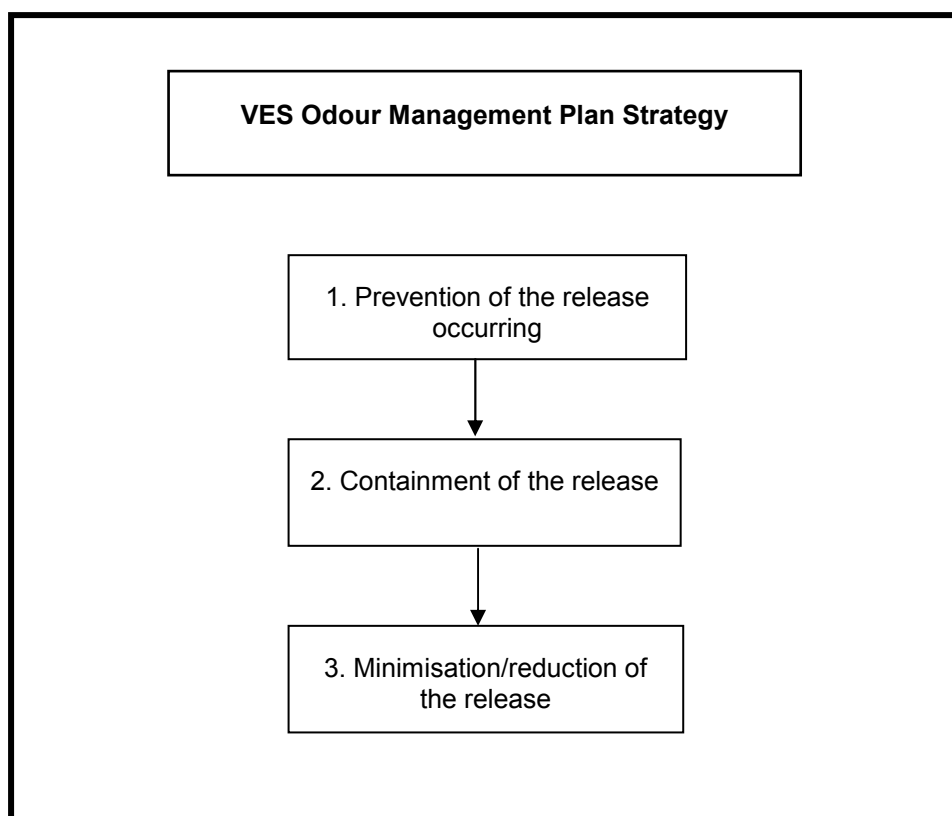
4.2.3 Transport for London Cycle Guide Area 10 shows several cycle routes near the site however these are not marked cycle lanes and do not permeate the site.

5 Operational and Process Controls

5.1 Odour Management Strategy

5.1.1 It is easier to minimise the quantities of odorous chemicals formed on site or to minimise their release through good working practices and process control, than it is to improve atmospheric dispersion. The OMP strategy promotes this approach by establishing a hierarchical structure (as illustrated in Figure 5.1), which, will underpin the operations at the MBT where the aim is to select the highest option as possible.

Figure 5.1 Odour Management Strategy



5.2 Operational Controls

- 5.2.1 The techniques for odour control have taken into consideration the indicative BAT requirements under the Environment Agency IPPC Sector Guidance Note EPR S5.06 for the Recovery and Disposal of Hazardous and Non-hazardous Waste and the best practice guidance from the Composting Association (*An Industry Guide for the Prevention and Control of Odours at Biowaste Processing Facilities* (2007)).
- 5.2.2 Odour minimisation is considered as part of normal MBT operations and will be achieved through management procedures, hazard assessments and environmental management plans. Additionally, an annual odour audit will be conducted to identify on-site sources of odour and to allow the odour inventory to be maintained. The odour management strategy relies on a combination of minimisation, containment and treatment techniques and operational procedures. Failure at any stage can lead to undesirable impacts, which may result in complaints.
- 5.2.3 The tiered approach is delivered through the implementation of several control types that are listed below. Each of the following control options shall be considered in sequence before any escalation to the next level.
- **Good Housekeeping and Good Working Practice (GWP).** Some odour problems may be the result of poor housekeeping and rectifying such lapses is usually the most cost-effective solution. A combination of standard operating procedures (SOP) and practices to be established within the EMS shall cover GWP.
 - **Process control.** Changes to the way the process is controlled, or improvements in control (including the addition of chemicals to prevent odour occurring), can sometimes achieve considerable reductions in odour emissions. This can often be the next most cost-effective approach.
 - **Process modification.** In some circumstances, modifying some of the unit operations in the process (based on new research or techniques) can be effective. The procedures established within the EMS shall identify stimuli for any process modifications.

- **Containment.** There are some situations where containment of odour sources may be practicable, e.g. sealing of manholes, or alternatively some entire processes can be carried out in sealed enclosures. However, odours from a process cannot always be controlled by total containment. In these situations it is typical to combine partial containment with extraction, venting the excess air to the atmosphere in a way that minimises its odour impact.
- **Enclosure with venting of excess air.** Some processes and plant can be partially enclosed so as to collect the odorous air. Excess air is then vented in a way that minimises its odour impact. This will normally be achieved by one of two mechanisms (or a combination of them both):
 - To disperse and dilute, where the odour is released from a vent, stack or chimney of a height to allow dilution and dispersion to occur to such an extent that the odour is insignificant by the time it reaches the nearest sensitive receptors.
 - To treat the odorous air using some form of end-of-pipe odour abatement system. Enclosure with venting of excess air can be costly, particularly for traditional large open processes, but may be the most favoured option for more compact processes. Other applications of this approach are deliberate venting of structures to maintain a negative pressure to prevent leakage.
- **End-of-pipe abatement systems.** There are many different techniques for abating odour in collected air. These can be divided into Biological Abatement Techniques and Non-biological Abatement Techniques. A related approach is the spraying of odour-masking or neutralising chemicals into the atmosphere, however it does not abate the odour as such.

5.2.4 The application of control measures is dependent on the practical, technological, safety and financial restraints associated to the process/release point. The category of odour control techniques employed at different sources is contained within Appendix C. A full description of the

processes and the control measures is provided within document ref. JER7548 Technical Standards, RPS 2009.

- 5.2.5 All air from the process will be discharged from the building via a scrubber to remove ammonia odour-causing bacteria and mould, and a biofilter (via an air humidifier). The air humidifier moistens the discharge air and removes ammonia spikes that may otherwise poison the microbial population.
- 5.2.6 The biofilter consists of a concrete cellar divided into four concrete areas with a network of pipes. The polluted air will be blown into the cellar and spread evenly over the biofilter material to optimise odour destruction. The biofilter material will consist of a mixture of chopped pine tree roots, which have excellent purification capacities. The pollution in the air will initially be adsorbed by the biofilter material and will then be used as a source of food by the micro-organisms. The humidity of the air must be more than 98% to facilitate micro-organism activity and this will be achieved by passing the air through an air humidifier.
- 5.2.7 From the biofilters, the air will be released at high level through two dispersion stacks located at the northern end of the building.
- 5.2.8 Negative pressure will be generated within the tunnels and within the MBT facility to prevent any odour and polluted air from escaping. Doors will be fitted with semi-automatic door closures, where required.
- 5.2.9 The MBT manager or his nominated deputies will be responsible for ensuring that the odour emission abatement is adequate and for identifying the potential need for further control. Control room operators will be trained to minimise releases through the efficient operation and maintenance of plant. Records of observations, maintenance, repairs and any corrective actions will be kept on site.
- 5.2.10 GWP odour control methods will be established as part of SOPs and will include:
- Ensuring deliveries of wastes inputs to the MBT are contained within designated areas of the building. Holding times of household waste are carefully controlled to minimise decomposition prior to processing;

- Ensuring all valves and vents within the MBT facility are designed and operated in accordance with SOPs and manufacturers specifications in order to prevent any odorous emissions; and
- Ensuring all relevant staff and contractors are trained on odour management, control issues and appropriate conditions of the permit. Periodic toolbox talks to further emphasise this matter.

5.2.11 The procedures developed as part of this OMP will consider conditions that have the potential to affect the process and the generation of odour, and maintain Veolia ES Southwark Ltd's commitment to attaining the highest possible GWP. These conditions include:

- Materials input (seasonal variation in weather may affect composition of waste input materials and its potential to generate odour);
- Process parameters (changes in temperature, aerobic conditions);
- Rate of throughput or increased hours of operation;
- Development of anaerobic conditions within the biodrying and biostabilisation tunnels;
- Routine maintenance and inspection;
- Start-up and shut-down of key plant and equipment;
- Power failure (although the provision of backup facilities should be considered);
- External failure of other utilities, e.g. water supply etc;
- Blocked air/water injection nozzles;
- Mechanical breakdown of abatement equipment such as pumps, fans etc;
- Dring out the biofilter material;
- Building damage which affects integrity due to for example storms;
- Failure of automatic doors, i.e. in open position;

- Failure in procedures to maintain containment (human error);
- Short term weather patterns which fall outside of the normal conditions for that area (i.e. highly unusual, not just the normal meteorological pattern - for example inversions and other conditions unfavourable to dispersion);
- Longer term weather patterns – prevailing wind direction, temperature, inversion conditions if these are normal variants of local weather.

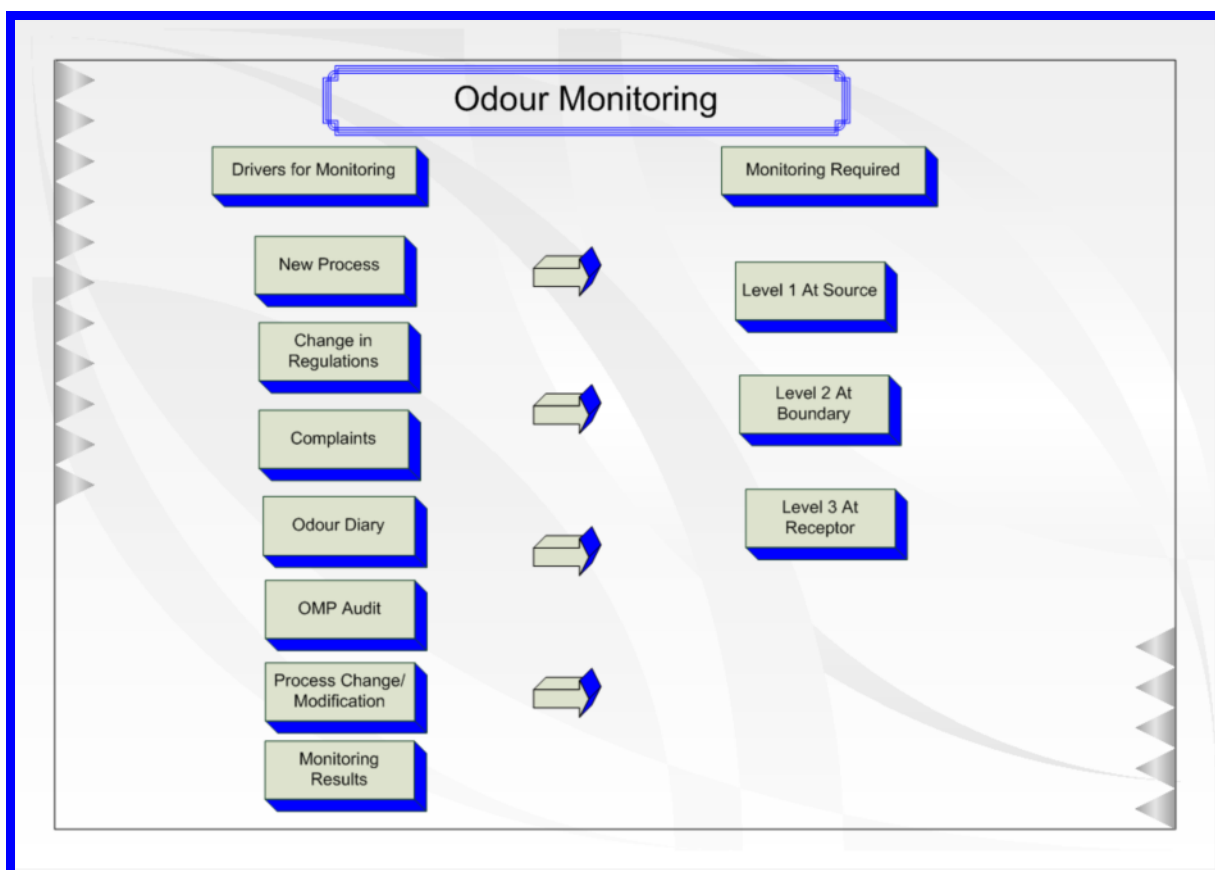
6 Monitoring and Auditing

6.1 Odour Monitoring

6.1.1 The purpose of monitoring can be both proactive (i.e. routine monitoring of performance in order to benchmark and improve environmental performance) and reactive (i.e. change in regulatory requirements or to qualify and quantify complaints).

6.1.2 Figure 6.1 illustrates the likely stimuli that will instigate a monitoring response. Monitoring responses can be ongoing as part of routine procedures, or temporary as part of an odour assessment.

Figure 6.1 Stimuli for Odour Monitoring



6.1.3 Once a monitoring need has been identified, the approach to both proactive and reactive monitoring follows the same monitoring hierarchy. This hierarchy

has three tiered levels, which are discussed below. For all 3 levels of assessment, monitoring results will be recorded and filed. Evaluation of these results may indicate that the next level of monitoring is required where it can be demonstrated that the odour is persistent.

Level 1: Site Odour Assessment

Sniff testing at source – procedures will be established that require the routine monitoring of identified processes and sources.

Level 2: Boundary Odour Assessment

Sniff testing at boundary – procedures will be established that require the routine monitoring of the site boundary. This routine monitoring is in part also determined by weather conditions (i.e. the wind direction towards a sensitive receptor will initiate a response).

Level 3: Olfactory Sampling

If a Level 3 response is initiated at an identified receptor then more appropriate detailed monitoring may be necessary in accordance with the requirements of Horizontal Sector Guidance H4.

- 6.1.4 Any of the above options may be used to provide information on odour levels where the purpose of the monitoring is to:
- Demonstrate if actions taken to reduce odours have been effective;
 - Demonstrate compliance with permit conditions; and
 - Carry out continuous checks on the effectiveness of the control measures in place.
- 6.1.5 It is envisaged that daily sniff tests will be carried out along the site boundary.
- 6.1.6 All odours will be recorded according to the list of descriptions contained within Appendix A to encourage consistency between assessors. Monitoring equipment will be calibrated in accordance with manufacturers' specifications and the Environment Agency's Monitoring Certification Scheme (MCERTS) requirements as part of the EMS procedure.

6.2 Direct Monitoring of Emissions from known Potential Odour Sources

6.2.1 Annual routine measurements will be undertaken from both of the dispersion stacks to monitor the performance of the biofilters. All stack monitoring will be undertaken in accordance with the dedicated procedures. Further details can be found in document ref. JER7548 Technical Standards, RPS 2009.

6.3 Site Odour Diary and Weather Monitoring

6.3.1 The tiered monitoring strategy will be supplemented by the maintenance of a site odour diary and the recording of weather conditions. Odour diaries can be useful for monitoring the duration, frequency, strength and character of odour impacts at various locations over a given period of time. This data can be used to determine the particular conditions under which, people are affected by odour from a source or sources.

6.3.2 An example of an odour diary is provided in Appendix D. The information recorded in the diary includes:

- date and time of day;
- duration of the event;
- continuity of the odour during the event;
- character and strength of odour;
- likely source of odour; and
- wind direction and strength.

6.3.3 Diarists should be given instructions on how to record information so that it is as consistent as possible. They should also be given feedback on the programme to help maintain their enthusiasm to continue keeping the records.

6.4 OMP Audits

6.4.1 Audits of the OMP will be undertaken in line with the programme set by the site's EMS.

6.4.2 Odour audits will be carried out in two parts:

- Firstly, an initial assessment of the boundary conditions to identify odours, which may either originate from the site or from an external source; and
- Secondly, an intense area audit, which uses the initial boundary information to target specific odour sources.

7 Non Conformances and Potential Corrective Actions

7.1 Corrective Action Initiation

7.1.1 It is anticipated that the need for corrective actions will come from:

- Performance auditing and monitoring as part of the OMP;
- Complaints;
- EMS;
- Changes in legislation; and
- Changes in the process.

7.1.2 Procedures will follow those to be established as part of the company QMS and EMS.

7.2 Complaint Odour Response and Investigation

7.2.1 All complaints will be logged using a complaints form an example of which is included Appendix E. Each complaint will be reviewed and assessed according to procedure. If the MBT is identified as the source of potential odour nuisance, then an appropriate assessment will be carried out in order to determine the cause of the complaint and the source of odour.

7.2.2 Actions taken in response to any odour complaints received should be recorded on the complaints form. Such actions will include any process controls implemented to reduce the odour emission.

7.2.3 The OMP and EMS complaints procedures will be followed in order to investigate the nature and cause of the complaint. The procedure will establish who within the company/on site will be/have:

- A central point of contact within the company/site to direct complaints;
- management responsibility for ensuring complaints are assessed and dealt with;

- technically responsibility for resolving any significant complaints ;
- responsibility for liaising with the regulatory bodies on progress (from receiving the complaint to resolution where assessed as significant);
- responsibility for liaising with the local stakeholders on progress (from receiving the complaint to resolution where assessed as significant);
and
- what complaints have been made and what action is being taken to identify and where appropriate, mitigate the cause.

7.2.4 If a direct cause can be attributed to MBT activities, appropriate corrective actions will be identified and programmed for remediation.

8 Record Keeping

8.1 Record Keeping

8.1.1 OMP records will be kept in accordance with the procedures to be established as part of the EMS and QMS. The type of information that will be retained relates to:

- Sensitive receptors – in particular the type of receptor, its location relative to the odour sources and an assessment of the impact of odorous emissions on the receptors;
- An overview of any complaints received, what they relate to (source/operation) and any remedial action taken;
- The types and source of odorous substances used or generated, (intentional or unintentional), release points and monitoring undertaken;
- A description of the indicative BAT requirements being considered;
- Identification of any circumstances or conditions, which compromise the ability to prevent or minimise odour annoyance, and a description of the actions that will be taken to minimise the impact.

8.2 Maintaining a Complaints Log

8.2.1 A complaints log will be maintained as part of the requirements of this OMP and the EMS. A change in the number of complaints is a reasonable indicator of the odour impact and the effectiveness (or otherwise) of measures implemented to reduce nuisance odour.

8.2.2 Information regarding the nature of the complaint will be used to assess the offensiveness of the odour. Subsequent investigation of the complaints will either 'confirm', 'fail to confirm' or 'further characterise' the odour incident.

8.2.3 Relevant staff (i.e. Safety, Environment and Quality Manager or nominated persons who may receive complaints) will receive the necessary training in

order to ensure the necessary detail for the complaints log is being received and recorded where possible. In the first instance, the complaint will be “screened” taking into account the following information:

- The “quality” of the complaint (i.e. organised campaign groups, local residents etc)
- The number of complaints against the alleged nuisance;
- The frequency of complaints, e.g. is it a one-off event or a regular occurrence;
- Knowledge of potential sources within the installation (cross-referenced with details of any plant problems, the wind direction of the installation and where the complaint was received, distance of the complaint to the site); and
- Knowledge of potential sources other than the installation (cross referenced with the wind direction of installation and where the complaint was received, distance of the complaint to the site).

8.2.4 The last two factors are necessary to confirm whether the MBT is indeed the source of the odour, rather than other potential sources in the area. This is a major part of the screening exercise.

8.2.5 Where necessary, a field odour assessment may be undertaken (by trained personnel) at the sensitive receptor in order to provide additional information regarding the complaint and the odour. It must be carried out during the time of the odour incident and therefore, the assessments can only be undertaken where longer-term and/or intermittent odour is reported. Regular odour checks will also be made by the Security department as part of their routine inspection of the boundary.

8.2.6 Further detailed assessment may be necessary either due to the level of complaints or the nature of the odour problem. This assessment will require Field Olfactometry measurements to be taken by trained staff and may be useful in the investigation of long-term or reoccurring odours, or to determine the effectiveness of control measures.

8.3 Communications

8.3.1 Where appropriate, Veolia ES Southwark Ltd shall involve the Local Authority Environmental Health Officer and the Environment Agency in their investigations.

8.3.2 The level of nuisance associated to odour can often be reduced if the affected individuals are provided with credible information about the odour, in particular:

- The process that generates the odour;
- Factors affecting dispersion;
- The health impacts (if any) associated with the odour
- The efforts being undertaken to control odours;
- The actions being taken in response to their complaint.

8.3.3 Offering credible reassurance and taking complaints seriously are two potentially cost-effective means of mitigating odour issues.

Appendices

Appendix A

List of Odour Descriptions

Odour Descriptions

Substance	Odour	Substance	Odour
Acetaldehyde	Apple, stimulant	Dimethyl sulphide	Rotten vegetable
Acetic acid	sour vinegar	Diphenylamine Floral	
Acetone	chemical/sweetish/solvent	Diphenyl sulphide	Burnt rubber
Acetonitrile	Ethereal	Ethanol	Pleasant, sweet
Acrylaldehyde	Burning fat	Ethyl acetate	Fragrant
Acrolein	Burnt sweet, pungent	Ethyl acrylate	Hot plastic, earthy
Acrylonitrile	Onion, garlic, pungent	Ethylbenzene	Aromatic
Aldehydes C9	Floral, waxy	Ethyl mercaptan	Garlic/onion, sewer, decayed cabbage, earthy
Aldehydes C10	Orange peel	Formaldehyde	Disinfectant, hay/straw-like, pungent
Allyl alcohol	Pungent, mustard like	Furfuryl alcohol	Ethereal
Allyl chloride	Garlic onion pungent	n-Hexane	Solvent
Amines	Fishy, pungent	Hydrogen sulphide	Rotten eggs
Ammonia	Sharp, pungent odour	Indole	Excreta
Aniline	Pungent	Iodoform	Antiseptic
Benzene	Solvent	Methanol	Medicinal, sweet
Benzaldehyde	Bitter almonds	Methyl ethyl ketone	Sweet
Benzyl acetate	Floral (jasmine), fruity	Methyl isobutyl ketone	Sweet
Benzyl chloride	Solvent	Methyl mercaptan	Skunk, sewer, rotten cabbage
Bromine	Bleach, pungent	Methyl methacrylate	Pungent, sulphide like
Sec-Butyl acetate	Fruity	Methyl sulphide	Decayed vegetables
Butyric acid	Sweat, body odour	Naphthalene	Moth balls
Camphor	Medicinal	Nitrobenzene	Bitter almonds

Odour Management Plan

Substance	Odour	Substance	Odour
Caprylic acid	Animal like	Phenol	Sweet, tarry odour, carbolic acid
Carbon disulphide	Rotten vegetable	Pinenes	Resinous, woody, pine-like
Chlorine	Irritating, bleach, pungent	Propyl mercaptan	Skunk
Chlorobenzene	Moth balls	Putrescine	Decaying flesh
2-Chloroethanol	Faint, ethereal	Pyridine	Nauseating, burnt
Chloroform	Sweet	Skatole	Excreta, faecal odour
Chlorophenol	Medicinal	Styrene	Penetrating, rubbery, plastic
p-Cresol	Tar-like, pungent	Sulphur dioxide	Pungent, irritating odour
Cyclohexane	Sweetish when pure, pungent when contaminated	Thiocresol	Rancid, skunklike odour
Cyclohexanol	Camphor, methanol	Toluene	Floral, pungent, moth balls
Cyclohexanone	Acetone-like	Trichloroethylene	Solventy
Diamines	Rotten flesh	Triethylamine	Fishy, pungent
1,1-Dichloroethane	Ether-like	Valeric acid	Sweat, body odour, cheese
1,2-Dichloroethylene	Chloroform-like	Vinyl chloride	Faintly sweet
Diethyl ether	Pungent	Xylene	Aromatic, sweet
Dimethylacetamide	Amine, burnt, oily		

Appendix B

Odour Source Inventory

Odour Management Plan

Source	Location	Activity & materials involved	Type of emissions	Likely odorous compounds	Release to atmosphere	
					Description	Characteristics
Waste delivery & reception	Site access road and weighbridge	Incoming loads of source-segregated green and kitchen waste	Fugitive to outside air	Fresh feedstock odours	Vehicle paths along the access road (fugitive line source)	Close to ground level intermittent release (3-8 loads per day) [to be confirmed] at ambient temperature.
	Waste reception area of MBT facility	Opening and closing of vehicle access doors	Fugitive.	Fresh feedstock odours	Escapes from open doors (fugitive area sources)	Close to ground level intermittent release, at ambient temperature.
		Tipping of waste into feedstock pile; storage	Fugitive. Peak at receipt & movement	Fresh feedstock odours	Biofilter stacks (2 off) (elevated point source)	Continuous release at 18 m, temperature \geq ambient, flow ¹ [to be confirmed]
		Handling, shredding and transfer of waste feed	Fugitive. Peak at shredding (3h per day)	Fresh feedstock odours		
Biodrying phase	Biodrying tunnels area of main MBT building	Loading of the tunnels	Fugitive.	Fresh feedstock odours		
		Active biostabilisation phase	Controlled. Peak at high temp phase	Breakdown process odours		
		Extraction & transfer to maturation	Fugitive.	Breakdown process odours		

Odour Management Plan

Sub-process / Phase	Location	Activity & materials involved	Type of source	Likely odorous compounds	Release to atmosphere	
					Description	Characteristics
Refining	Refining area of MBT building	Screening of composted material	Fugitive. Little bio activity, little odour potential	Residual breakdown process odours		
Product storage & dispatch	Final product area of MBT building	Storage of stabilised waste	Fugitive. Little bio activity, little odour potential	Residual breakdown process odours		

Appendix C

General Odour Control Techniques

Summary of General Odour Controls for Main Sources of Odour at MBT

Source Name	Category	Good House-keeping	Process Control	Process Modification	Containment	Enclosure with Venting	End-of-pipe Abatement
Waste delivery and reception	Fugitive	✓			✓	✓	✓
Biodrying Tunnels	Fugitive and controlled	✓	✓		✓	✓	✓
Storage Area	Fugitive – little odour potential				✓	✓	✓

Appendix D

Odour Diary and Weather Conditions Record

Odour Management Plan

Odour Diary

Date	Time	Odour event duration (hours)	Continuity of the odour for this event (tick one box)				Character of odour	Likely source of odour	Strength of odour	Description of effect odour has on you	Wind direction	Wind strength
			Continuous	Most of the time	50% of the time	Intermittent						

Weather Conditions Record

INSTALLATION/ LOCATION		DATE	
Weather		Wind (strength & direction)	
Temperature (deg. C)		Bar. Pressure (mbar) if known	
Ground condition		General air stability, (if known)	
General air quality		Cloud cover %/height Low, high, very high	
Time: start		Time: Finish	

Appendix E

Complaints Form

Table 7.2 Form for the recording of an odour-related complaint

Odour Complaint Report Form		Sheet No	
Date:	Installation to which complaint relates	Grid Reference:	
Name and address of complainant:			
Tel no. of complainant:			
Time and date of complaint:			
Date, time and duration of offending odour:			
Location of odour, if not at above address:			
Weather conditions (ie, dry, rain, fog, snow):			
Cloud cover (0-8):			
Cloud height (low, high, very high):			
Wind strength - (light, steady, strong, gusting) or use Beaufort scale:			
Wind direction:			
Complainant's description of odour (i.e. comparison with other odours, strong/weak, continuous, fluctuating):			
Has complainant any other comments about the odour?			
Are there any other complaints relating to the installation, or to that location? (either previously or relating to the same exposure)			
Any other relevant information:			
On-site activities at time the odour occurred:			
Operating condition at time offensive odour occurred (e.g. flow rate, pressure at inlet and pressure at outlet)			
Actions taken:			
Form completed by		Signed	