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Lamby Way Open Windrow Composting Facility

Kelda Organic Energy (Cardiff) Limited

Environmental Permit (EP) Variation Application

Odour Management Plan (OMP)

SLR Ref: 407.04012.00009/OMP



February 2015

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## 1.0 INTRODUCTION

### INFORMATION (February 2015)

Kelda Organic Energy (Cardiff) Limited (Kelda) has instructed SLR Consulting Limited (SLR) to prepare an Odour Management Plan (OMP) to support the operation of an open windrow composting (OWC) Facility at Lamby Way, Cardiff.

This OMP outlines the methods by which Kelda will systematically assess, reduce and prevent potentially odorous emissions from the composting facility during normal operation and during potential abnormal events.

Where this information is not yet available, a note has been made in the text. This OMP is a working document and will be updated by the operator as information becomes available.

This is normal practice for an OMP, which is an active document.

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Since the OMP is relevant to the day-to-day operation of the composting facility, each activity has been referred to in the present tense (i.e. 'is operating' rather than 'will be' operating).

## 1.1 Odour Regulation

*Additional guidance for H4 Odour Management: How to comply with your environmental permit* (hereafter referred to as 'H4 guidance') describes how the IPPC Directive includes odour in the definition of pollution and requires that "...all the appropriate preventive measures are taken against pollution ...". This Directive has been transposed in the UK by the Environmental Permitting Regulations (EPR). Sites encompassed within these Regulations will have odour conditions stated within their environmental permit.

This OMP has due regard to the principals set out in EA guidance H4. This OMP also has due regard to the measures set out in the following guidance notes;

- Environment Agency (EA) Guidance, How to Comply with your Environmental Permit;
- EA Guidance, H1 Environmental Risk Assessment for Permits (Annex A);
- EA Guidance, Odour Management Plans for Waste Handling Facilities;
- EA Guidance S5.06, Recovery and Disposal of Hazardous and Non-Hazardous Waste; and
- The Composting Industry Code of Practice: Industry Guide for the Prevention and Control of Odours at Biowaste Processing Facilities.

The environmental permit issued for the site is likely to include a condition to regulate odour, as follows.

*Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in an approved odour management plan, to prevent or where that is not practicable to minimise the odour.*

*The operator shall:*

- (a) if notified by Natural Resources Wales that the activities are giving rise to pollution outside the site due to odour, submit to Natural Resources Wales for approval within the period specified, an odour management plan;*
- (b) implement the approved odour management plan, from the date of approval, unless otherwise agreed in writing by Natural Resources Wales.*

Kelda must therefore employ the appropriate measures necessary to prevent odour pollution, or minimise it where prevention is not practicable. The measures that are appropriate depend on the waste activities undertaken, the site-specific circumstances of the facility and the costs and benefits associated with different methods for odour control.

## **1.2 OMP Objectives**

OMPs are developed and employed with three pollution prevention objectives;

- to identify and employ 'all appropriate measures' to minimise the generation and emissions of odorous substances and subsequent exposure / impact;
- to prevent exposure of people outside the site to levels of odour which would result in annoyance (unacceptable pollution); and
- to minimise the risk of unplanned odour release incidents or accidents which have the potential to result in off-site odour annoyance.

This OMP serves to aid the decision-making process on the choice of controls, general site design, and operational practice in line with current industry best practice. The OMP is a working document with the specific aims of ensuring;

- odour impact is considered as part of routine operations;
- the minimisation of the risk of unplanned odour releasing incidents or accidents that could result in off-site annoyance;
- odour is primarily controlled at source by good operational practices, the correct use and maintenance of plant, and operator training; and
- 'all appropriate measures' are taken to prevent or, where that is not reasonably practicable, to minimise odorous emissions to air from the facility.

## **1.3 OMP Approach and Structure**

Available guidance suggests that an OMP should contain the following elements;

- an assessment of the risks of odour problems, from normal and abnormal situations, including worst case scenarios, for example of weather, temperature, or breakdowns, as well as accident scenarios;
- the appropriate controls (both physical and management) needed to manage those risks;
- suitable monitoring;
- actions, contingencies and responsibilities when problems arise;
- regular review of the effectiveness of your odour control measures; and
- emission limits (where appropriate).

OMPs are also required to include clear statements to demonstrate that the operator understands and accepts its responsibilities. In particular, it should show;

- that Kelda, either directly or through its contractors or subcontractors, ensures that equipment on site is operated and maintained such that it is effective in the control of odour at all times;
- that Kelda is familiar with the characteristics of the processes and equipment on site and have identified the areas of risk of emissions from odour;
- how Kelda reduce or cease operations if necessary to avoid serious odour pollution;
- how Kelda engage with neighbours to minimise their concerns and complaints; and
- how Kelda respond to complaints.

Due to the nature of the proposed waste activities (waste types, waste tonnages and processing activities), this OMP is a qualitative assessment of the risks to amenity from odour only. The aim of this OMP is to identify any significant risks and demonstrate that the risk of pollution or harm will be acceptable by taking the appropriate measures to manage these risks.

All receptors that are near the site and could reasonably be affected by odour from the activities have been identified and considered as part of the assessment. All potentially sensitive receptors are detailed within Table 3 of this OMP and on Drawing 003.

Management measures are proposed to limit and mitigate the potential for off-site odour nuisances.

## **2.0 SOURCES, RELEASES AND IMPACTS**

This section provides an inventory of potential odour sources, release points, pathways and receptors relevant to the OWC Facility.

### **2.1 Description of Operations**

The purpose of the OWC Facility is to store and treat waste for recovery to produce a PAS 100 certified compost product.

The site treats up to 38,000 tonnes per annum of green waste by open-windrow composting. The input to the site varies seasonally; however, the maximum throughput is approximately 1,167 tonnes over 7 days (approximately 167 tonnes per day). Wastes are received from three different sources, including;

- kerbside green waste collections;
- green waste from household waste recycling centres; and
- commercial users delivering green waste to the site.

Treatment consists only of manual sorting, separation, screening, shredding and composting in open-windrows into different components for recovery.

The OWC Facility operates throughout the year in accordance with the operating hours specified in the relevant planning permission.

At any one time, maximum storage of waste at the site will be 8,500 tonnes. Of this storage, an 850 tonne at any one time limit will apply to the storage of waste prior to the formation of a windrow. A 7,650 tonne at any one time limit will apply to wastes undergoing biological treatment i.e composting and maturation.

In addition, the facility has the capacity to store up to 2,300 tonnes of compost product.

### **2.2 Odour Sources and Odour Control**

Green waste types are not considered to pose a significant odour risk. However, the storage and treatment of wastes at the facility takes place in the open i.e. without a building. It is therefore important that the activities are managed in a way to limit the production of odour at the source in preference to the containment and abatement of emissions which may be produced.

The following measures are in place to limit the production of odour at the facility;

- strict waste acceptance procedures;
- rejection at the gate of unsatisfactory waste deliveries;
- the quarantine and removal off-site of particularly odorous wastes;
- limits on the length of time that wastes are stored and treated on site;
- close control of the composting process;
- regular turning of windrows;
- routine olfactory monitoring; and
- contingencies in the event of an incident or accident.

Further information regarding these techniques to control odour production at the site are described in Section 4, 5, 6 and 7 of this OMP.

## **2.3 Good Working Practices**

The application of good working practices and process control is of fundamental importance in eliminating and minimising the quantities of odours formed on site and their subsequent release to atmosphere. This section provides an inventory of all potential odour sources under the full range of normal operating conditions.

The OWC Facility is operated and managed in accordance with the accepted hierarchy of preferred controls, that is:

1. to prevent the formation or emission of odorous compounds in the first place; and
2. where this is not practicable, minimise the release of odour.

There are three primary potential odour sources associated with the composting facility;

- the development of anaerobic conditions during the composting process
- the breakdown of stored wastes awaiting treatment; and
- contaminated wastes.

There are a number of controls in place which minimise the potential for odour associated with these sources. These are discussed in detail below.

### **2.3.1 Control of the Composting Process**

The development of anaerobic conditions during the composting process has the potential to lead to the production of malodorous compounds causing a nuisance to off-site receptors. It is therefore important that the process is monitored and controlled to prevent the development of anaerobic conditions.

Indicators to developing anaerobic conditions include;

- moisture;
- odours;
- low rates of temperature rise;
- physical appearance; and
- oxygen levels.

Throughout the composting process it is important that these variables are routinely monitored and optimum conditions for aerobic composting of waste is maintained.

### **2.3.2 Stored Waste**

The storage of wastes prior to processing is a source of risk with regards to the production of odours. During their storage and prior to processing, wastes will begin to naturally breakdown through decomposition. Uncontrolled decomposition of the wastes may lead to the development of anaerobic conditions which are a significant source of odour issues at composting facilities.

### **2.3.3 Contaminated Waste**

Contaminated waste deliveries, for example with readily putrescible wastes, have the potential to be a significant source of odour if received at the site. Inspection of wastes as they arrive at the facility limits the potential for the receipt of contaminated wastes. If on inspection a load proves to be of unreasonable odour strength or is visibly contaminated,

then it is reloaded onto the delivery vehicle if possible. If this is not possible, the contamination is moved to the quarantine skip. Where wastes within the quarantine skip prove to be a source of unacceptable odour, removal of the skip to a suitable licensed facility is arranged.

## 2.4 Release Points

The release points for the odour sources detailed above are described in Table 1 below.

The release points consider all unintentional non-emergency releases that may occur. Release occurrences considered an emergency are addressed in Section 6.

**Table 1 - Odour Source List**

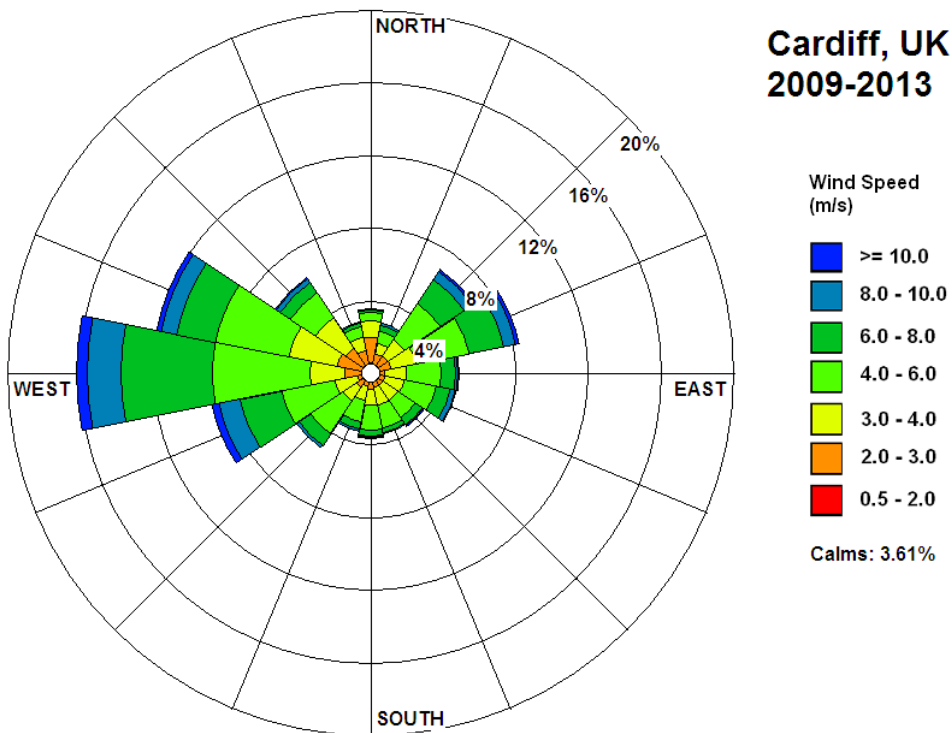
<b>Activity</b>	<b>Odour Risk</b>	<b>Control measures?</b>
Delivering waste	Low	Delivery of waste in vehicles
Storage of waste pre-processing	Medium	Limits on pre-processing storage time / amount, strict waste acceptance procedures, routine olfactory monitoring
Composting of waste	Medium	Monitoring and control of process, routine olfactory monitoring, regular turning of windrows
Temporary storage of quarantined wastes	Low	Small amounts of quarantined wastes stored in the skip, removal of quarantined waste off-site as required, routine olfactory monitoring
Storage of compost product	Low	Limits on product storage time / amount, routine olfactory monitoring

## 2.5 Pathways

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 conversely low wind speeds inhibit the dilution of odours.

The Department for Environment, Farming and Rural Affairs (Defra) confirm that the site is not located within an area designated as an Air Quality Management Area.

Prevailing wind directions are considered in assessing the likelihood and management of fugitive emission risks. Wind speed and direction data have been obtained for five years from Cardiff. A wind rose of speed and direction is presented in Figure 1. It shows the prevailing wind to be from the west. As a result, the potential impact of fugitive emissions is likely to be greater to the east of the site.



**Figure 1 - Wind Rose for Cardiff 2009 - 2013**

## 2.6 Receptors

The likelihood and frequency of exposure to odour arising from the facility is determined by the magnitude of release, the prevailing meteorological conditions and the distance and direction of receptors in relation to the facility.

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

The site's setting and potential receptors to odour are further detailed in Section 3 of this report.

### 3.0 SITE SETTING AND RECEPTORS

#### 3.1 Site Setting

The site is located on the western edge of the Wentlooge Levels approximately 4km north east of Cardiff City Centre and 1km south of Rhymney. Access to the site is achieved via the B4239 which is located approximately 775m to the north of the site.

The National Grid Reference for the centre of the site is ST 23010 77658 and the site location is illustrated on Drawing 001.

The surrounding land-use and receptors are illustrated on Drawings 003 and 004, and are identified in Table 2 below.

**Table 2 - Surrounding Land Uses**

Boundary	Description
North	Open land and the Lamby Way Eastern Extension Landfill lie immediately to the north of the site. Beyond these lie Rhosog Fach Reen (a surface water drain) and a number of residential and commercial /industrial properties.
East	Open land, the Cardiff Coastal Footpath and the Severn Estuary are situated to the east of the site.
South	To the south of the site lies a public footpath and the Severn Estuary.
West	The Severn Estuary lies almost immediately to the west of the site. Beyond this lies Lamby Way Eastern Extension Landfill and Rhymney River.

The immediate surrounding land use is described in further detail below:

#### Residential Properties

The closest residential property to the proposed site boundary is Mardy House located approximately 270m north. Other residential properties include Mardy Farm approximately 375m north east and Seabank Farm located 455m north of the proposed site boundary.

#### Industrial and Commercial Premises

The proposed site boundary lies within the boundary of Lamby Way Eastern Extension landfill which extends to the north-west for approximately 1.17km. GMH Vehicle Recyclers Limited and Mardy Farm Caravan Storage are located approximately 205m and 430m north of the proposed site boundary, respectively.

#### Major Roads and Transport Links

There are no major roads or transport links located within 500m of the site's proposed boundary. The closest major road is B4239 from which access to the site is gained. The B2439 is located approximately 775m to the north of the site.

##### **3.1.1 Receptors**

Table and Drawing 003 show the locations of receptors that are considered to be potentially sensitive and could reasonably be affected by odours produced by the waste management activities. Those to the east, which may be at higher risk from the prevailing wind direction, are highlighted in bold. The receptor most likely to be affected is the Cardiff Coastal Path.

The path is likely to be used transiently e.g. people walking along it as opposed to the continuous use by a group of individuals. The coastal path is not considered to be high risk in the same way as a residential property would be.

**Table 3 - Identified Receptors**

Receptor Name	Receptor Type	Direction from Site	Approximate Distance from site boundary (at nearest point)
<b>Identified receptors within 500m of the Environmental Permit Boundary as shown on Drawing 003 Sources, Pathways and Receptors</b>			
Lamby Way Eastern Extension Landfill	Industrial/Commercial	All Directions	Adjacent
Open land	Open land	North, East and West	Adjacent
Public Footpath	Recreational	South and South West	15m
Surface Water Retention Pond	Surface Water	East	15m
<b>Severn Estuary</b>	<b>Surface Water / Protected Habitat</b>	<b>East</b>	<b>30m</b>
Rhosog Fach Reen	Surface Water	East and North East	35m
<b>Cardiff Coastal Footpath</b>	<b>Recreational</b>	<b>East</b>	<b>60m</b>
Mardy Farm Caravan Storage	Commercial	North	430m
GMH Vehicle Recyclers Ltd	Industrial	North	205m
Mardy House	Residential	North	270m
Mardy Farm	Residential	North East	375m
Seabank Farm	Residential	North	455m

#### **4.0 SPECIFIC RISK ASSESSMENT TABLES**

Table 4 uses the H1 Annex A methodology for identifying and assessing the risks in four steps, as follows;

Step 1 Identify risks from your activity.

Step 2 Where risks are identified from Step 1 then assess the risks and check that they are acceptable using the relevant modules provided as annexes to the H1 Guidance.

Step 3 Justify appropriate measures to control your risks, if necessary.

Step 4 Present your assessment.

Step 1 is a screening step to identify the potential risks to the environment from the proposed development.

Step 2 identifies people or parts of the environment that could be harmed (at potentially significant risk) by the activity. Where appropriate, the assessment demonstrates how the risk of pollution or harm can be mitigated by measures to manage these risks (Step 3).

Table 4 presents the assessment (Step 4) in terms of hazards posed, receptors and pathways, along with management and residual risks for odour.

**Table 4 - Odour Risk Assessment and Management Plan**

What do you do that can harm and what could be harmed		Managing the Risk		Assessing the Risk		
Hazard	Receptor	Pathway	Risk management	Probability of exposure	Consequence	What is the overall risk
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
The development of anaerobic conditions during the composting process.	Cardiff coastal path.  Residential properties including: <ul style="list-style-type: none"> <li>Mardy House</li> <li>Mardy Farm</li> <li>Seabank Farm.</li> </ul> Commercial and Industrial properties including: <ul style="list-style-type: none"> <li>Mardy Farm</li> <li>Caravan Storage</li> <li>GMH Vehicle Recyclers Ltd.</li> </ul> Public footpath to the south of the site.	Air.	<u>Site Setting and Receptor Sensitivity</u>  The site is located within a relatively isolated setting. The nearest residential receptor is located approximately 270m to the north of the site.  Receptors sensitive to odour, for example residential properties, educational facilities and commercial properties are not in the direction of the prevailing wind.  Receptors located in the direction of the prevailing wind direction include the Cardiff Coastal Path and the Severn Estuary. The Severn Estuary is not considered to be affected by odour whilst the use of the coastal path by individuals is transient.  <u>Windrow Turning and Internal Temperature Monitoring</u>  Windrows are maintained at either; <ul style="list-style-type: none"> <li>an internal temperature of at least 55°C for at least fourteen consecutive days with a minimum of five turnings; or</li> <li>an internal temperature of at least 65°C for</li> </ul>	Low.  Monitoring of conditions will enable the control of the composting process.  The location and direction of potentially sensitive receptors further reduce the likelihood of exposure.	Odour nuisance and loss of amenity.	<b>Not significant</b>

What do you do that can harm and what could be harmed		Assessing the Risk		
Hazard	Receptor	Managing the Risk	Probability of exposure	
Hazard	Receptor	Risk management	Consequence	
Hazard	Receptor	Risk management	What is the overall risk	
What has the potential to cause harm?	What is at risk what do I wish to protect?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the risk that still remains? The balance of probability and consequence
		<p>at least seven consecutive days with a minimum of three turnings.</p> <p>In addition;</p> <ul style="list-style-type: none"> <li>windrows are turned at a frequency that maintains aerobic conditions within the windrow.</li> <li>records are made in the site diary of the date and results of internal temperature monitoring and the date on which each windrow is turned.</li> </ul> <p><u>Windrow Moisture Content</u></p> <ul style="list-style-type: none"> <li>windrow moisture content is maintained between 40% (w/w) and 60% (w/w) during composting.</li> <li>where the moisture content of a windrow has been measured as being above 60% (w/w), remedial action is taken to decrease the moisture content to between 40% (w/w) and 60% (w/w).</li> <li>where the moisture content of a windrow has been measured as being below 40% (w/w), remedial action is taken increase the moisture content to between 40% (w/w) and 60% (w/w).</li> <li>records are made in the site diary of the date and results of moisture content</li> </ul>		

What do you do that can harm and what could be harmed		Assessing the Risk	
Hazard	Receptor	Pathway	Risk management
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?
			<p>monitoring.</p> <p><u>Monitoring</u></p> <p>The composting process is closely monitored by site personnel to ensure that anaerobic conditions within the windrows do not arise. The following variables are used as indicators to developing anaerobic conditions within the windrows;</p> <ul style="list-style-type: none"> <li>• moisture;</li> <li>• odours;</li> <li>• low rates of temperature rise;</li> <li>• physical appearance; and</li> <li>• oxygen levels.</li> </ul> <p>Olfactory monitoring is undertaken downwind of the site on a twice daily basis by a suitably qualified and competent person. Olfactory monitoring is scheduled to take place, or is undertaken in addition to routine monitoring, while activities which have the potential to release odours are undertaken, for example during the turning of windrows.</p> <p>In the event that odours are detected, investigations will be undertaken to determine the cause and appropriate remedial action</p>
			<p>How likely is this contact?</p> <p>What is the harm that can be caused?</p> <p>What is the overall risk</p> <p>What is the risk that still remains? The balance of probability and consequence</p>

What do you do that can harm and what could be harmed		Managing the Risk	Assessing the Risk	
Hazard	Receptor	Risk management	Probability of exposure	Consequence
What is the potential to cause harm?	What is at risk what do I wish to protect?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?
		taken. <u>Responsibilities</u> The Operations Manager is responsible for implementing risk management measures in accordance with the site's operating procedures and this OMP.		
The storage of wastes pre-processing.		<u>Site Setting and Receptor Sensitivity</u> The site is located within a relatively isolated setting. The nearest residential receptor is located approximately 270m to the north of the site. Receptors sensitive to odour, for example residential properties, educational facilities and commercial properties are not in the direction of the prevailing wind. Receptors located in the direction of the prevailing wind direction include the Cardiff Coastal Path and the Severn Estuary. The Severn Estuary is not considered to be affected by odour whilst the use of the coastal path by individuals is transient. <u>Waste Acceptance</u>	Low. Limits on the storage of waste pre-processing will limit the potential for the production of malodours. The location and direction of potentially sensitive receptors further reduce the likelihood of exposure.	What is the risk that still remains? The balance of probability and consequence
				<b>Not significant</b>

What do you do that can harm and what could be harmed		Assessing the Risk	
Hazard	Receptor	Risk management	Probability of exposure
What has the potential to cause harm?	What is at risk what do I wish to protect?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?
		<p>The facility only accepts green wastes. These are considered to have a low potential for the production of negatively perceived odours. No putrescible waste, such as food waste, is accepted at the facility.</p> <p>Wastes which are received from different sources are kept separate to limit the potential for contamination.</p> <p><u>Storage Limits</u></p> <p>Limits are in place to prevent the development of anaerobic conditions and / or the build of a waste stream prior to shredding and the formation of windrows, as follows;</p> <ul style="list-style-type: none"> <li>• 850 tonnes of feedstock pre shredding; or</li> <li>• 4 weeks since the arrival of waste on site.</li> </ul> <p>At the point of one of these limits being reached, whichever comes first, the waste stream is shredded and formed into windrows.</p> <p><u>Monitoring</u></p> <p>Olfactory monitoring is undertaken downwind of the site on a twice daily basis by a suitably qualified and competent person. Olfactory</p>	<p>What is the risk that still remains? The balance of probability and consequence</p>

What do you do that can harm and what could be harmed				Assessing the Risk		
Hazard	Receptor	Pathway	Risk management	Probability of exposure	Consequence	What is the overall risk
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
Contaminated waste and the temporary storage of quarantined wastes.			<p>monitoring is scheduled to take place, or is undertaken in addition to routine monitoring, while activities which have the potential to release odours are undertaken, for example shredding.</p> <p>In the event that odours are detected, investigations will be undertaken to determine the cause and appropriate remedial action taken.</p> <p><u>Responsibilities</u></p> <p>The Operations Manager is responsible for implementing risk management measures in accordance with the site's operating procedures and this OMP.</p> <p><u>Site Setting and Receptor Sensitivity</u></p> <p>The site is located within a relatively isolated setting. The nearest residential receptor is located approximately 270m to the north of the site.</p> <p>Receptors sensitive to odour, for example residential properties, educational facilities and commercial properties are not in the direction of the prevailing wind.</p>			
				Low.	Wastes contaminated with malodorous materials are not routinely accepted onto site and are turned away where possible.	<b>Not significant</b>

What do you do that can harm and what could be harmed		Assessing the Risk	
Hazard	Receptor	Pathway	Risk management
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?
			<p>Receptors located in the direction of the prevailing wind direction include the Cardiff Coastal Path and the Severn Estuary. The Severn Estuary is not considered to be affected by odour whilst the use of the coastal path by individuals is transient.</p> <p><u>Non-Conforming Waste</u></p> <p>In the event that non-conforming wastes are delivered to site, they are isolated to the quarantine skip and removed from the site at the earliest opportunity. If identified on the vehicle, the waste will remain in the vehicle and be sent off site to a suitably permitted facility.</p> <p>For green waste arriving from a kerbside collection service, a collection log is completed to detail any non-conforming wastes. Kelda use these logs to identify the source of the non-conforming waste. To prevent reoccurrence these details are fed back to the collection service.</p> <p><u>Monitoring</u></p> <p>Olfactory monitoring is undertaken downwind of the site on a twice daily basis by a suitably qualified and competent person.</p>
			<p>How likely is this contact?</p> <p>The location and direction of potentially sensitive receptors further reduce the likelihood of exposure.</p>
			<p>What is the harm that can be caused?</p> <p>What is the risk that still remains? The balance of probability and consequence</p>

What do you do that can harm and what could be harmed		Managing the Risk	Assessing the Risk	
Hazard	Receptor	Risk management	Probability of exposure	Consequence
What has the potential to cause harm?	What is at risk what do I wish to protect?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?  What is the risk that still remains? The balance of probability and consequence
Storage of compost product		<p>In the event that odours are detected, investigations will be undertaken to determine the cause and appropriate remedial action taken, for example covering the quarantine skip to contain odours.</p> <p><u>Responsibilities</u></p> <p>The Operations Manager is responsible for implementing risk management measures in accordance with the site's operating procedures and this OMP.</p> <p><u>Site Setting and Receptor Sensitivity</u></p> <p>The site is located within a relatively isolated setting. The nearest residential receptor is located approximately 270m to the north of the site.</p> <p>Receptors sensitive to odour, for example residential properties, educational facilities and commercial properties are not in the direction of the prevailing wind.</p> <p>Receptors located in the direction of the prevailing wind direction include the Cardiff Coastal Path and the Severn Estuary. The Severn Estuary is not considered to be affected by odour whilst the use of the coastal path by</p>	<p>Low.</p> <p>The compost is not likely to produce odour at levels likely to cause pollution outside of the site.</p> <p>The location and direction of potentially sensitive receptors further reduce the likelihood of exposure.</p>	<p><b>Not significant</b></p>

What do you do that can harm and what could be harmed		Assessing the Risk	
Hazard	Receptor	Risk management	Probability of exposure
What has the potential to cause harm?	What is at risk what do I wish to protect?	What measures will you take to reduce the risk? – Who is responsible for what?	How likely is this contact?
		<p>individuals is transient.</p> <p><u>Process Control</u></p> <p>The composting process is closely monitored and controlled with the aim of achieving a compost product which meets the PAS 100 Specification. Compost which meets these specifications is unlikely to produce odours at a level likely to cause pollution outside of the site.</p> <p><u>Storage Limits</u></p> <p>Limits are in place to prevent the build of product, as follows;</p> <ul style="list-style-type: none"> <li>• 2,300 tonnes; or</li> <li>• 6 months since the formation of the product batch.</li> </ul> <p>Prior to either of these limits being reached, the product will be sampled, tested and distributed off-site for sale.</p> <p><u>Monitoring</u></p> <p>Olfactory monitoring is undertaken downwind of the site on a twice daily basis by a suitably qualified and competent person.</p>	<p>What is the risk that still remains? The balance of probability and consequence</p>
			<p>What is the harm that can be caused?</p>
			<p>What is the overall risk</p>

What do you do that can harm and what could be harmed		Assessing the Risk	
Hazard	Receptor	Pathway	Risk management
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? – Who is responsible for what?
			<p>In the event that odours are detected, investigations will be undertaken to determine the cause and appropriate remedial action taken.</p> <p><u>Responsibilities</u></p> <p>The Operations Manager is responsible for implementing risk management measures in accordance with the site's operating procedures and this OMP.</p>
			<p><b>Probability of exposure</b> How likely is this contact?</p> <p><b>Consequence</b> What is the harm that can be caused?</p> <p><b>What is the overall risk</b> What is the risk that still remains? The balance of probability and consequence</p>

## **5.0 MONITORING**

The Operations Manager will be ultimately responsible for the monitoring of odour. Responsibilities are detailed in Appendix B.

Olfactory odour monitoring will be undertaken twice daily.

### **5.1 Effectiveness of Odour Control Measures**

#### **5.1.1 Sources of Odour Emission**

The effectiveness of odour control at the composting facility is reliant on waste acceptance controls and the close monitoring and control of the composting process. These controls will limit malodour production at the source.

If fugitive emissions from the site are identified as being responsible for unacceptable off-site odour impacts, a review of the process design will be undertaken to identify if the controls are performing as anticipated. The review will make recommendations based on its findings to aid in the improvement of the site's performance.

### **5.2 Monitoring Odorous Releases**

#### **5.2.1 External Procedure**

External checks take place at least twice daily under normal operating conditions. When there may be shortened working hours the checks take place on a pro-rata basis according to the number of hours the facility is operational.

The checks are to be done by nominated site operatives and involve sensory field odour assessment ("sniff testing"). The assessment is "sensory" in that the human nose is used as the detector – a sound approach considering that no analytical instrument can give a unified measure of a complex mixture of compounds in the same way that a human experiences odour.

Sniff testing is employed in the following circumstances:

- as part of a survey at the compost facility's site boundary during normal operations, to confirm the effective performance of odour control measures in place;
- at the compost facility's site boundary during periods of adverse meteorological conditions, breakdowns or during other abnormal events to evaluate the effectiveness of the control measures in place and the likelihood that odour complaints will be received; and
- in the event that complaints are received, at the locations of sensitive receptors as part of the complaint investigation procedure outlined in Section 6.5.

Any appropriate information is to be entered into the site diary and a form 'External odour assessment sheet' – see Appendix C shall be completed.

If a complaint or notification is raised from outside of this process then any appropriate information is to be entered into the site diary and a form 'External odour assessment complaint form' – see Appendix E shall be completed.

If any of these checks assess that an odour is present an odour detection sheet shall be completed (see Appendix D) and appropriate action to mitigate the odour will take place.

The first assessment of an odour will be whether the odour has or is likely to leave site, if it has not and is not likely to leave site the problem that caused the odour shall be investigated and appropriate action taken including, but not limited to the quarantine and removal of the offending item from the site as soon as practicable. All information regarding action taken shall be recorded on the external odour assessment sheet.

If an odour at a level which is likely to cause pollution is likely to leave the site's boundary, or has already, the facility manager or assistant and NRW must be notified immediately.

If upon investigation the odour is found to come from a particular waste stream, process, quarantined waste or product batch, arrangements will be made to remove the offending item from the site to a suitably licensed facility as soon as practicable.

### **5.3 Monitoring Meteorological Conditions**

The monitoring of real-time meteorological data is an effective tool in the management of odorous emissions from the facility. Certain meteorological conditions, such as temperature inversions, can result in poor dispersion of fugitive waste odours. This can potentially lead to an increased risk of odour annoyance at sensitive receptors.

The system is used at the composting facility for the following reasons:

- during routine operations, to plan where boundary monitoring should be focused to assess odour impacts;
- at the time of abnormal events to predict where odour impacts could potentially occur; and
- in the investigation of odour complaints or to verify community observations.

### **5.4 Monitoring Impacts**

Monitoring of impacts will be achieved by recording and monitoring complaints. Complaints may be reported directly to site or via Local Environmental Health or NRW (24-hr complaint reporting system) if it is felt necessary.

Complaints records will include: date and time, nature of complaint, locality of complaint, name of complainant (if available), a summary of investigation and actions taken and outcome.

In the event of a complaint more frequent off-site olfactory monitoring will be undertaken until the issue is resolved as described in Section 6.5.

### **5.5 Record Keeping**

Daily records are maintained and include the following details:

- results of inspections and any olfactory monitoring carried out by site personnel;
- weather conditions;
- operational problems including date, time, duration, prevailing weather conditions and cause of problem;
- complaints received including address of complainant (if available); and
- details of corrective action taken and any subsequent changes to operational procedures.

These will be recorded in the site diary. The Operations Manager will be ultimately responsible for ensuring that records are kept.

## **5.6 Neighbour Relations**

The following measures have been adopted to ensure a 'good neighbour' approach to local receptors:

- a telephone number is available for residents to contact the site on site board; and
- the response to odour complaints promptly and to keep complainants informed of the outcome of investigations.

## 6.0 CONTINGENCIES

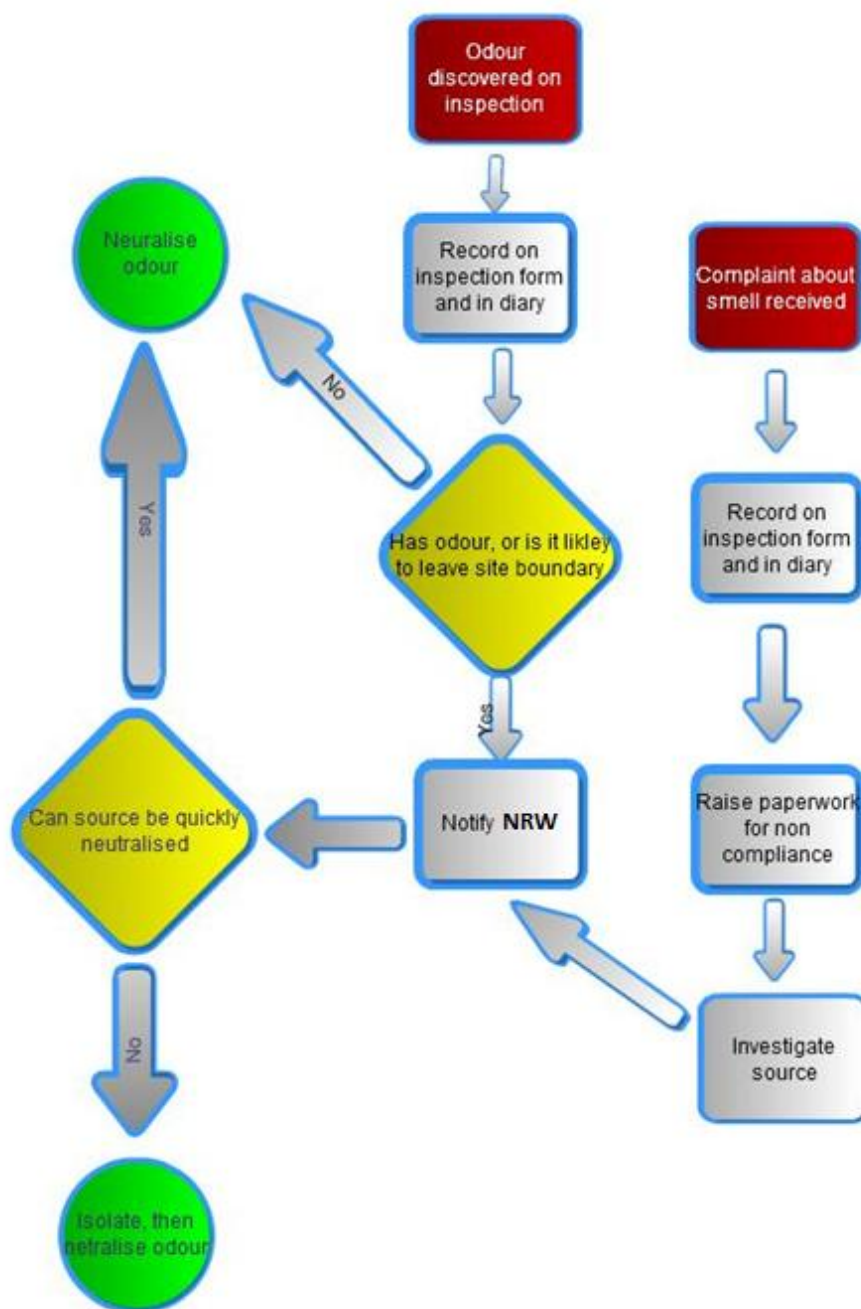
In accordance with guidance on odour management plans, contingency plans have been defined to react to situations where monitoring indicates that a potential odour source is not completely under control, meteorological conditions are unfavourable or that adverse impact has occurred.

The following accidents (or incidents) which would result in the loss of control of odorous substances and have the potential to cause an unacceptable short-term impact on the local community, but are not considered an emergency situation (which are detailed in Section 7).

These situations have been identified as:

- receipt of particularly odorous wastes;
- requirement to undertake temporary odorous activities;
- abnormal meteorological conditions;
- detection of site odour at the site boundary or off-site during routine odour surveys;  
and
- receipt of an odour complaint that is attributable to the site.

In these instances, the following odour event action flow chart is followed;



**Figure 2 - Odour Event Action Flowchart**

In the case of the composting facility, neutralising odour is taken to mean clearance of the offending waste type from the facility as soon as is practicably possible, and to cease accepting odorous waste types until the problem is rectified and under control.

### 6.1 Receipt of Particularly Odorous Wastes

Such wastes are either:

- loaded back onto the vehicle that delivered them before they are accepted at the facility; or

- quarantined and removed from the facility to a suitably licensed site as soon as is practicable.

Where unacceptable odour exposure is traced back to a particular waste received, acceptance of further consignments of this waste category from that particular waste producer will be addressed with further investigations and identification of a solution. For example, for green waste arriving from a kerbside collection service, a collection log is completed to detail any non-conforming wastes. These logs are used to track the source of the non-conforming waste, for example a specific household collection service and street. To prevent reoccurrence these details are fed back to the collection service.

## **6.2 Temporary Odorous Activities**

On occasion it may be necessary to undertake temporary actions that are likely to cause potentially significant odorous emissions. In these situations the Operations Manager will contact NRW and other interested parties (e.g. residents) before such actions are taken to advise them of the operation being undertaken and that any odour will be of a temporary nature.

Additional control measures will incorporate:

- where practicable, timing operations when the prevailing wind direction is away from sensitive receptors; and
- ensuring prompt re-establishment of normal operations

If such operations unavoidably coincide with unfavourable meteorological conditions (i.e. warm and still conditions) additional off-site odour monitoring will be undertaken to clarify the significance of off-site impact.

## **6.3 Abnormal Meteorological Conditions**

Extreme meteorological conditions that promote the generation of odour and inhibit its effective dispersion, specifically high temperatures and stable conditions, may result in increased risk of impact at receptor locations.

Contingency measures to minimise the risk of unacceptable odour exposure at receptor locations during these conditions, will include but not be limited to consideration of:

- the quarantine and removal off-site of odorous wastes.

## **6.4 Odour 'Events'**

This may include detection of odour at the site boundary or off-site during routine odour surveys or response to complaints.

The olfactory survey is followed and the odour source or sources identified by determining the sources of greatest odour intensity. Contingency actions are implemented as necessary which will include but not be limited to:

- the quarantine and removal off-site of odour sources.

The olfactory survey is repeated after initiation of corrective actions, until odour has reduced to an 'odour intensity level 2' as determined by the Operations Manager or representative.

## 6.5 Receipt of an Odour Complaint

The following actions are taken on receipt of an odour complaint:

1. The Operations Manager is informed of the odour complaint as soon as possible, including the location, time and date (if reported) of the complaint being lodged.
2. The Operations Manager (or any appointed representative) undertakes the following assessment process:
  - Review of the waste operations and environmental control systems at the site prior to and at the time of the complaint to include;
    - determine if waste was being received at the time of the complaint;
    - examine weighbridge records to determine if any abnormal loads were received;
    - determine if any abnormal operating conditions were being undertaken;
    - determine if any accidents or incidents requiring contingency actions were being undertaken (Section 6 of OMP);
    - determine if any emergency situations existed at the time (Section 7 of OMP).
  - Review of the meteorological conditions (wind speed and direction) prior to and at the time of the complaint – to establish whether a pathway can be established between the site and the complainant;
  - Review the previous history of complaints at the location identified.

If the Operations Manager considers that a source and pathway may be present between the site and the complainant, the Operations Manager (or appointed representative) will visit the complaint location as soon as is possible in order to subjectively determine odour presence/absence and, if present, odour characteristics and intensity in accordance with the procedure detailed in Appendix A.

## **7.0 EMERGENCY PLANS**

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

The section considers the emergency scenarios, measures taken to minimise their occurrence and short-term measures to minimise impacts.

### **7.1 Fire**

The action plan in the event of a fire is detailed in the site's Environmental Management System.

Fire fighting equipment is kept at appropriate, unobstructed locations, kept in a good condition and serviced at least once a year by a competent person.

With regard to management of odour impact, the key principals are prompt responses that contain the fire and attempt to extinguish it.

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

### **7.2 Staff Absence**

The composting facility will be operated on a shift basis. This method of operation incorporates many levels of redundancy meaning that the facility will always have personnel on stand-by.

Prolonged or short-term staff shortages will therefore not affect the ability of the site to operate effectively.

If prolonged, widespread absence occurs, Kelda would empty the composting facility and suspend operations.

### **7.3 Flooding**

The Environment Agency website confirms that the site lies within an area which is at risk from flooding. However, it identifies flood defences located to the south and west of the site along the boundary with the Severn Estuary which protect it from flooding. The defences in place protect the site from the flooding of the river up to a 1 in 100 year flood event.

However, if the site becomes flooded, this would inhibit effective reception and processing of delivered waste. Material will either be rapidly processed; or where not possible removed from site.

Widespread flooding of the site may also prevent the operation of key electrical equipment and vehicular access. Under such extreme conditions no further operations would be undertaken and no further waste would be received and it is likely that NRW would be involved in any clean-up operation. Waterlogged material will either be rapidly processed; or where not possible removed from site.

Widespread flooding may prevent access to site. In such a situation no further waste would be able to access the site and priority would be given to ensuring the ongoing effective processing of waste.

The site is hard surfaced and is maintained free of potholes. In addition, drainage is in place. Good housekeeping measures ensure the integrity of the surfacing and drainage, and hence the opportunity for localised flooding after heavy rainfall is minimised.

#### **7.4 Power Failure**

In the event of a power failure, operations of the composting facility are unlikely to be affected, with the exception of on-site utilities (i.e. lighting). Operations on-site would continue without power unless the general health and welfare of staff are at risk. In the event that the general health and welfare of staff is at risk, operations would be suspended until power is restored.

#### **7.5 Failure of equipment**

A routine maintenance plan and inspection schedule for equipment will be implemented by Kelda. This includes inspection of the composting slabs and containers. This is further detailed in the site's Environmental Management System.

## **8.0 DOCUMENT UPDATES AND REVIEWS / MANAGEMENT**

Kelda is committed to managing effectively the off-site impacts of odour from the composting facility. This commitment extends from policies produced at director level, to the resources available to the competent personnel, to the abilities of the personnel managing odour-critical work tasks.

This section describes the responsibility for the management and operation of the composting facility.

The composting facility will be operated with due regard to the site's Environmental Management System.

Kelda have appointed managers with the executive authority and responsibility for implementing the Management System. Work instructions, job descriptions and procedures exist for critical areas of the company's activities and have been issued to or made available to personnel responsible for undertaking these tasks.

Kelda have a well-defined and formally documented management structure for managing the impacts of odour from the composting facility. It is the responsibility of the Operations Manager, with the support of site operatives, to identify environmental risks that are relevant to the site and determine if a particular activity or service is environmentally significant.

Once identified, it is the responsibility of the Operations Manager to highlight the significant aspects to all relevant employees and contractors. The Operations Manager is ultimately responsible for monitoring and managing all activities under the company's control to improve environmental performance.

### **8.1 General Procedures for Training and Competency of Staff**

Training and competency of staff is controlled by Kelda's Environmental Management System. The Management System covers training, awareness and competence. The company identifies training requirements of its employees and provides suitable resources to ensure they have the required knowledge, skills and expertise to carry out their duties. This includes their roles and responsibilities in complying with the policy statements, the Management System and all relevant legislation. This is achieved through induction training for new employees, awareness training for all and specific training as required. Contractors and all persons performing tasks on behalf of the Company will be made aware of the policy and relevant Management System requirements and will be competent in the roles undertaken.

Staff competency and the need for training is continually assessed by site management and supervisors and under all circumstances will be reviewed (at least) annually and formally recorded within the Management System.

### **8.2 Complaints Management and Registration**

#### ***8.2.1 Publicising contact details for odour complaints***

Members of the public are able to contact Kelda with any odour complaints about the composting facility by using the telephone numbers on the site board at the site entrance.

Once a complaint has been received and the details collected, the complaint must be processed. This involves the actions described below.

### **8.2.2 Complaint registration**

Kelda maintain a record of all complaints received. In the event that Kelda receives a complaint alleging potential odour nuisance from the composting facility, the complaint is recorded in a systematic way, enabling comparison with standard odour descriptors, wind direction, wind speed and site work activities.

The Kelda complaints register is inspected on a monthly basis by the Operations Manager to obtain the data necessary for complaints monitoring and analysis. The results of this complaints monitoring and analysis is reported as described in Section 6.5.

### **8.2.3 Roles and responsibilities for complaints management**

The following team members deal with specific aspects of the complaint.

- Site Operatives - report complaints and investigate; and
- Operations Manager - responsible for recording complaints and investigation.

### **8.2.4 Collecting the relevant complaint details**

Wherever possible, the following minimum information is collected for each complaint:

- the time and date when the offensive odour was observed;
- the location where the offensive odour was observed, e.g. postal address, grid reference) and its sensitivity;
- the complainant's description of the odour. This should include a subjective description of all the factors necessary to make an assessment of the impact of the odour, including intensity, character, relative unpleasantness, frequency and duration;
- the identity of the complainant, if possible, to assess the repeated nature of complaints;
- the residential address of the complainant; and
- any other information the complainant can offer which may be applicable.

## **8.3 OMP Update and Review**

This OMP is a controlled document, and forms part of Kelda's Management System. A comprehensive record of the results of the monitoring and inspection programme contained within Sections 5 and 6 of this OMP will also form part of the local Kelda Management System.

The OMP will be reviewed on an annual basis, as a minimum.

However, the OMP is intended to be a live document which serves as a reference during daily operations, and as such would be updated on a more frequent basis should the following occur:

- significant changes are made to the plant or operational practices;
- there is a change to the management structure, designation of responsibility or training provision;
- NRW requests that the OMP is updated, in their role as regulator; or
- complaints are received, which on subsequent investigation result in the identification of further control measures or remedial action, in addition to those set out within this OMP.

## **9.0 CONCLUSION**

This OMP is provided as part of the application for an environmental permit variation application for the Lamby Way OWC Facility.

This qualitative risk assessment has considered odour. The assessment concludes that with the implementation of the risk management measures described above, potential hazards from the proposed development are not likely to be significant and no further assessment is required.

## **10.0 CLOSURE**

This report has been prepared by SLR Consulting Limited with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of Kelda Organic Energy (Cardiff) Limited. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the client and others in respect of any matters outside the agreed scope of the work.

## APPENDIX A - ODOUR SURVEY METHODOLOGY

The odour assessor should not be subject to significant site odour in the 30 minutes prior to the assessment. This is to ensure that monitors are not suffering from odour fatigue and will be sensitive to site odours. Furthermore the following exclusions shall apply:

- staff members that are regularly exposed to site odours for longer than 30 minutes; and
- any staff members known or suspected of having a very poor sense of smell should not be used for odour monitoring routinely.

The inspections shall be undertaken as follows:

1. The inspector should walk slowly and breathe normally. The inspector should begin their assessment at areas of expected low odour concentration, i.e. upwind of the site, and should move to areas of high odour concentration. If odour is detected while walking, the intensity should be recorded as at least 3 (distinct), or higher.
2. If an odour cannot be detected whilst walking, the inspector should periodically stand still and inhale deeply facing upwind. If odour is then detected, but can only be detected in this manner, the odour 'intensity' should be recorded as 2 (faint).
3. Following detection of any odour of intensity 3 or above at the site boundary during an odour inspection, the following measures will be taken:
  - the olfactory survey will deviate to determine the extent of plume downwind (at or above an intensity level 3) and at potential receptors affected. Contingency measures outlined in Section 6.4 will be followed; and
  - an on-site inspection shall be carried out seeking to trace any observed odour back to source so that the appropriate corrective and/or preventative action can be taken (with regard to Contingency Measures detailed in Section 6).

On-site inspections would be undertaken by continuing the olfactory survey methodology onto the site to inspect all potential odour sources. Particular attention shall be paid to the composting process.

The Operations Manager shall be notified immediately of any detected odours that are considered to have the potential to give rise to significant off-site odour impact (intensity 3 at a receptor location). The contingency measures detailed within Section 6.4 should be followed.

## **APPENDIX B - MANAGEMENT RESPONSIBILITY**

The Operations Manager (or Deputy) will have responsibility for ensuring that nuisances and hazards arising from the installation due to odour are minimised. Meetings will be held as required 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 Kelda to the relevant personnel.

**APPENDIX C – ODOUR ASSESSMENT CHECK SHEET**

External Odour Assessment Check Sheet										Date					
Time	Odour rating 0 - 5 (0=no odour)	Odour detection sheet	Diary	Time	2nd		3rd		Diary	Time	Odour detection sheet	Odour rating 0 - 5 (0=no odour)	Odour detection sheet	Diary	
					Yes/No	Yes/No	Yes/No	Yes/No							
1st			Yes/No						Yes/No					Yes/No	Yes/No
Location 1															
Location 2															
Location 3															
Location 4															

**APPENDIX D – ODOUR DETECTION SHEET**

Who discovered the odour	
Name:	
Phone No:	
When was the odour discovered?	
Date:	
Time:	
Where was the odour?	
Was anyone else aware of this? - Detail	
What scale was the odour 0 - 5 (0 = no odour)	
What was the cause of the odour?	

How has the issue been addressed (i.e. solved)?

Have the management been notified?

Date:

Time:

To Whom:

Have NRW been notified?

Date:

Time:

To Whom:

Please print your name and sign:

**APPENDIX E – ODOUR DETECTION COMPLAINT FORM**

Who made the complaint?	
Name:	
Address:	
Phone No:	
When was the complaint made?	
Date:	
Time:	
When was the complaint regarding?	
Date:	
Time:	
What was the complaint regarding?	

Was anyone else aware of this? - Detail

Did the complaint relate to your site?

What has been done to make sure that it does not happen again?

Have NRW been notified?

Date:

Time:

To Whom:

Please print your name and sign:

**APPENDIX F – TRAINING RECORD RELATING TO THE OMP**

Name	Job title	Assessment Training		
		Needed?	Date Trained	Refresher Due

**APPENDIX G – MAINTENANCE SCHEDULE RELATING TO THE OMP**

<b>Maintenance Checklist</b>						
<b>Item requiring maintenance / calibration</b>	<b>Frequency</b>				<b>Where are maintenance instructions?</b>	<b>Who is responsible?</b>
	<b>Daily</b>	<b>Weekly</b>	<b>Monthly</b>	<b>Yearly</b>		
Shredder						
Telescopic handler						
Process monitoring equipment e.g temperature probes						
Trommel screen						
Surfacing and Drainage						

**APPENDIX H – MAINTENANCE RECORDS RELATING TO THE OMP**

<b>Item Inspected:</b>		<b>Telescopic handler</b>	<b>Due:</b>	<b>Daily</b>
<i>Completed on</i>		<i>Completed by</i>		<i>Comments</i>
<b>Item Inspected:</b>		<b>Telescopic handler</b>	<b>Due:</b>	<b>Daily</b>
<i>Completed on</i>		<i>Completed by</i>		<i>Comments</i>

<b>Item Inspected:</b>			<b>Due:</b>
<i>Completed on</i>	<i>Completed by</i>		<i>Comments</i>

<b>Item Inspected:</b>			<b>Due:</b>
<i>Completed on</i>	<i>Completed by</i>		<i>Comments</i>

<b>Item Inspected:</b>			<b>Due:</b>
<i>Completed on</i>	<i>Completed by</i>		<i>Comments</i>

<b>Item Inspected:</b>			<b>Due:</b>
<i>Completed on</i>	<i>Completed by</i>		<i>Comments</i>