



# **CLIMATE CHANGE RISK ASSESSMENT**

**Lamby Way Open Windrow Composting Facility**

**FREELAND HORTICULTURE  
LIMITED**

## REVISION LOG

Version	Details	Date
1	Initial Draft	16/07/25

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## 1.0 INTRODUCTION

This document is a new requirement of environmental permit holders as set out by the Environment Agency in their guidance document titled: Develop a management system: environmental permits. This document is written in accordance with this guidance and sets out the considerations and operational details that are relevant to the operation of Freeland Horticulture Limited's (FHL) Open Windrow Composting Facility at Lamby Way, Cardiff (hereon referred to as the 'Site') This CCRA looks to set out the nature of different climate change risks, their relevant impacts as well as mitigation measures at the Site.

### 1.1 Site Location

Freeland Horticulture Limited  
Lamby Way  
Rumney  
Cardiff  
CF3 2HP

### 1.2 Operational Location

ST 230 776 *Lat:51.492939 Long: -  
3.1091416*

### 1.3 Assessment Process

Climate change means that extreme weather events are becoming more common and more severe.

This CCRA will identify key elements of climate change that could have an impact on the Site, and then identify the impacts, risks and mitigation methods of these impacts of climate change, these elements include:

- Summer daily maximum temperature
- Winter daily temperature
- Daily extreme rainfall and average winter rainfall
- Drier summers
- River flow
- Storms

Each one of these climate change risks may have a significant impact on the site's operational and daily management, affect upstream and downstream supply chains, and have negative effects for customers as well as end markets.

Producing this CCRA supports FHL to:

- Be compliant with the requirements of their environmental permit.  
Reduce impact on the environment during an extreme weather event.
- Including  
the event's impact on operations, either through accidental release or abnormal operation.
- Improve resilience and business continuity by avoiding unplanned incidents and other business interruption.

## 2.0 CLIMATE CHANGE MANAGEMENT

The potential impacts to the Site from climate change and extreme weather are assessed below and have been assigned an initial risk rating, and a residual risk rating when considered in the context of current on-site measures. This score is determined by the likelihood and magnitude/severity of the impact as presented in table 1 below:

**Table 1 - Risk Rating**

Risk Rating		Magnitude/Severity (1 Lowest - 5 Highest)				
		1	2	3	4	5
Likelihood (1 Lowest - 5 Highest)	1	1	2	3	4	5
	2	2	4	6	8	10
	3	3	6	9	12	15
	4	4	8	12	16	20
	5	5	10	15	20	25
Risk Rating Legend						
Risk Rating	Very Low	Low	Low	Medium	High	Very High
Likelihood & Magnitude/Severity Legend						
	Likelihood to Occur			Magnitude/Severity of the impact		
1	Highly Unlikely			Negligible		
2	Unlikely			Minor		
3	Probable			Significant		
4	Likely			Major		
5	Highly Likely			Severe		

### 2.1 Summer Daily Maximum temperature.

This may be around 7 °C higher compared to current average temperatures, with the potential to reach extreme temperatures as high as over 40 °C with increasing frequency based on today's values.

Climate Change Impacts	Judgement		Action		
	Initial Risk	Justification of magnitude	Current measures on site	Residual Risk	Potential Mitigation Opportunities
<b>Summer Daily Maximum Temperatures</b>					
Rising air temperatures could lead to windrows getting too hot therefore killing bacterial microorganisms essential for decomposition and/or losing moisture, leading to a decrease in the decomposition of material, slowing the composting process.	<b>Medium</b>	The Magnitude for this impact is medium due to the current controls in place on site. The impact is expected to cause a disruption to site processes.	<ul style="list-style-type: none"> <li>The site uses the compost manager system and logs both the temperature and moisture content of the windrows regularly.</li> <li>Temperature probes are calibrated at least annually.</li> <li>Machines available to turn material if internal temperature gets too high.</li> <li>Bowser will be used to increase moisture content in windrows if required.</li> </ul>	<b>Low</b>	<ul style="list-style-type: none"> <li>Increased process monitoring in spells of prolonged heat and dry weather</li> </ul>

Possibility of increased feedstock that will contain lower volumes of nitrogen waste.	<b>Low</b>	This impact would be low in magnitude due to the limited impact of changes in feedstock as the temperature increases in summer. While not of significant magnitude, these impacts may occur due to temperature variations and may have an impact on business operations.	<ul style="list-style-type: none"> <li>• Regular monitoring of moisture and temperature of waste materials is undertaken to limit the risk of uncontrolled combustion.</li> <li>• Site processes ensure correct C/N ratios are followed when mixing waste in batch formation.</li> </ul>	<b>Very Low</b>	<ul style="list-style-type: none"> <li>• Increased process monitoring in spells of prolonged heat and dry weather</li> <li>• Management to ensure C/N Plan is followed</li> </ul>
Potential increase in dust, odour and Bioaerosol emissions.	<b>Medium</b>	This risk would be increased as it would result in more dry and dusty days on site, The location of the site on the bank of the River Severn and given the exposed open nature of the site coupled with variable wind	<ul style="list-style-type: none"> <li>• An odour management plan is in place on site.</li> <li>• Bioaerosols are monitored by external consultants quarterly as required by the permit.</li> <li>• Site is equipped with a weather station that will supply accurate real time information on weather conditions.</li> <li>• Odour monitoring is carried out and logged four times a day during summer hours.</li> </ul>	<b>Low</b>	<ul style="list-style-type: none"> <li>• Spraying of the operational surface and site access road may be undertaken on a more regular basis.</li> <li>• Increased odour monitoring during spells of hot and dry weather may be required at known sensitive receptors.</li> </ul>

		conditions would have an impact on business operations and could lead to the escape of emissions that could also affect the local community.	<ul style="list-style-type: none"> <li>• Odorous processes are stopped when the wind direction is toward a sensitive receptor.</li> <li>• Site operational surface is dampened down during dry spells to limit the escape of dust from the site.</li> </ul>		
Increase for the potential for pest related issues such as fly or rodent infestations.	<b>Medium</b>	Pests such as flies, rats and scavenging birds may be attracted to the site by the storage of waste materials and can cause considerable nuisance to the local community. During hotter summers this impact will be increased.	<ul style="list-style-type: none"> <li>• Inspections of the facility are carried out at regular intervals by a pest control contractor.</li> <li>• Rejection of odorous and pest infected waste</li> <li>• Measures are implemented and maintained throughout the operational life of the site to control and monitor the presence of pests on the site.</li> </ul>	<b>Low</b>	<ul style="list-style-type: none"> <li>• Continue to prevent infestations through good management practices and ensure site housekeeping is of a high standard.</li> </ul>

## 2.2 Winter daily temperature

This could be 4 °C more than the current average with the potential for more extreme temperatures, both warmer and colder than present.

Climate Change Impacts	Judgement		Action		
Impact	Initial Risk	Justification of magnitude	Current measures on site	Residual Risk	Potential Mitigation Opportunities
<b>Winter daily temperature</b>					
Decreases in winter temperatures resulting in restricted access to the site, due to frozen access roads causing disruption to deliveries and site operator attendance.	<b>Medium</b>	A fall in winter daily temperatures could increase periods of ice on surrounding road networks impacting access to the Site.	<ul style="list-style-type: none"> <li>• Mobile plant can be used to clear accumulation of snow on site access roads.</li> <li>• Monitoring of weather reports to anticipate subzero temperatures or snow.</li> </ul>	<b>Low</b>	<ul style="list-style-type: none"> <li>• Liaise with the local authority to ensure maintenance of the primary public access route to the site.</li> <li>• Consider the impact of frozen access road within the Emergency Response Procedure, and development of a contingency plan in case operators and deliveries cannot access site on a given day.</li> <li>• Establish procedures to monitor weather conditions and enact pre-emptive mitigation actions.</li> </ul>

### 2.3 Daily Extreme Rainfall and Average Winter Rainfall

Daily rainfall intensity could increase by up to 20% on today's values and average winter rainfall may increase by over 40% on today's averages. These two weather incidents have been considered together and are presented together in the Risk Assessment given the similar impacts, risks and mitigation methods.

Climate Change Impacts	Judgement		Action		
Impact	Initial Risk	Justification of magnitude	Current measures on site	Residual Risk	Potential Mitigation Opportunities
<b>Daily Extreme Rainfall and Average Winter Rainfall</b>					
Surface water flooding of the Site	<b>Medium</b>	The site is located on the Severn Estuary and lies in an area that is at risk of flooding, there is considered to be a medium risk from flooding due to surface water	<ul style="list-style-type: none"> <li>Site drainage system is in good order and maintained regularly.</li> <li>Site pumping station is in good order and maintained regularly.</li> </ul>	<b>Low</b>	<ul style="list-style-type: none"> <li>Ensure through good management practices and ensure site housekeeping is of a high standard, pumps and drainage system are well maintained</li> </ul>
Access or egress from site could be affected. Impacting staff, suppliers, deliveries, removals of product, and emergency services.	<b>Medium</b>	Portions of the surrounding area and local road network, including access to the Site are indicated to be at risk of surface water flooding.	<ul style="list-style-type: none"> <li>If a flood warning is given for the local area, the Site Manager will determine whether areas identified to be at risk need to be made safe</li> </ul>	<b>Low</b>	<ul style="list-style-type: none"> <li>Liaising with the local authority to ensure maintenance of the primary public access route to the site.</li> </ul>

		This may impact and potentially prevent access to the Site by staff and vehicles.			
Potential for drainage systems and interceptors to be overwhelmed.	<b>Medium</b>	An increase in rainfall may cause the existing drainage systems to be overwhelmed and unable to cope. Given the Site is considered to be a medium risk of surface water flooding it is likely that any significant surface water flooding may also overwhelm the drainage.	<ul style="list-style-type: none"> <li>• Regular maintenance and cleaning of the site drainage system, holding chamber and pumping station.</li> <li>• High Level alarm on pumping station gives an audible warning if levels rise above threshold</li> </ul>	<b>Low</b>	<ul style="list-style-type: none"> <li>• Increased inspections of the drainage system during winter months</li> </ul>

## 2.4 Drier summers

Summers could see potentially up to 40% less rain than now.

Climate Change Impacts	Judgement		Action		
Impact	Initial Risk	Justification of magnitude	Current measures on site	Residual Risk	Potential Mitigation Opportunities
<b>Drier summers</b>					
Increased need for water for site irrigation and windrows	<b>Low</b>	Drier summers may lead to higher levels of evaporation therefore an increase the demand for water within the composting process	<ul style="list-style-type: none"> <li>Lagoon situated next to the site that holds approx. One million litres of water will be used for dust suppression and for adding moisture to the windrows.</li> </ul>	<b>Very Low</b>	<ul style="list-style-type: none"> <li>Monitor water levels during drier summers</li> </ul>

## 2.5 River flow

The flow in the watercourses could be 50% more than now at its peak, and 80% less than now at its lowest.

Climate Change Impacts	Judgement		Action		
Impact	Initial Risk	Justification of magnitude	Current measures on site	Residual Risk	Potential Mitigation Opportunities
<b>River flow</b>					
Flooding of the Bristol Channel to the south and west of the Site boundary.	<b>Medium</b>	The site is located on the Severn Estuary and lies in an area that is at risk of flooding, there is considered to be a medium risk from flooding due to surface water	<ul style="list-style-type: none"> <li>Containment system in place at the site.</li> <li>There is a flood defence located on the south and west of the site along the boundary with the Severn Estuary which protect it from flooding. The defences are in place to protect the Site from flooding of the river up to a 1 in 100-year flood event.</li> </ul>	<b>Low</b>	<ul style="list-style-type: none"> <li>Ensure through good management practices and ensure site housekeeping is of a high standard, pumps and drainage system are well maintained</li> </ul>

## 2.6 Storms

Storms could see a change in frequency and intensity. The unique combination of increased wind speeds, increased rainfall, and lightning during these events provides the potential for more extreme storm impacts.

Climate Change Impacts	Judgement		Action		
Impact	Initial Risk	Justification of magnitude	Current measures on site	Residual Risk	Potential Mitigation Opportunities
<b>Storms</b>					
Storms and high winds could damage buildings and other structures e.g., fuel storage shed, with the potential to pollute the environment.	<b>Medium</b>	Structures present on-Site including the Fuel storage tanks, office and other structures may be vulnerable to adverse weather comprising increased wind speeds, increased rainfall and lightning events. In the event of storms and high winds, there's a risk of structural damage which could disrupt Site activities operations.	<ul style="list-style-type: none"> <li>Visual inspections are undertaken by operatives and potential damages are captured as part of these planned maintenance checks.</li> <li>In severe weather conditions, warnings and communications are issued depending on the risks.</li> </ul>	<b>Low</b>	<ul style="list-style-type: none"> <li>Update the Emergency Response Procedure to consider the potential impact to the Site and its structures from storms and high winds.</li> <li>Develop procedures to manage site operations and staff safety in storm events and to inspect and repair any potential damage</li> </ul>

## 2.7 Sea level rise

Sea levels could rise by as much as 0.6m higher compared to today's level.

Climate Change Impacts	Judgement		Action		
Impact	Initial Risk	Justification of magnitude	Current measures on site	Residual Risk	Potential Mitigation Opportunities
<b>Sea level rise</b>					
As the site is situated near the coast, there is potential increased risk of flooding.	<b>Medium</b>	The site is located on the Severn Estuary and lies in an area that is at risk of flooding, there is considered to be a medium risk from flooding due to surface water	<ul style="list-style-type: none"> <li>• Containment system in place at the site.</li> <li>• There is a flood defence located on the south and west of the site along the boundary with the Severn Estuary which protect it from flooding. The defences are in place to protect the Site from flooding of the river up to a 1 in 100-year flood event.</li> </ul>	<b>Low</b>	<ul style="list-style-type: none"> <li>• Ensure through good management practices and ensure site housekeeping is of a high standard, pumps and drainage system are well maintained</li> </ul>