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Project No: 313306

Odour Management Plan

Prepared for:

2ZLF Ltd

West Meadows Industrial Estate

Derby

DE21 6HA

Contents Amendment Record

This report has been issued and amended as follows:

Revision	Description	Date	Signed
1.0	Final	02 June 2023	Graeme Kennett

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Acknowledgement

This report has been prepared for the sole and exclusive use of 2ZLF Ltd in accordance with the scope of work presented in Mabbett & Associates Ltd (Mabbett) Additional Services Letter Agreement (313306/ASL/GK), dated 17 May 2023. This report is based on information and data collected by Mabbett. Should any of the information be incorrect, incomplete or subject to change, Mabbett may wish to revise the report accordingly.

This report has been prepared by the following Mabbett personnel:

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This report has been reviewed and approved by the following Mabbett personnel:

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Nicholas Clark, MEng, AMIChemE
Environmental Engineer

Executive Summary

Table 1-1: Site details	
Site name	WEST MEADOWS WASTE RECOVERY FACILITY
Site address	Downing Road West Meadows Industrial Estate Derby DE21 6HA
Operator name	2ZLF Limited (2ZLF)
Permit number	EPR/AB3904UQ

This OMP will be made available to;

- All staff
- Site visitors
- Contractors working at the site

Table 1-2: Document owner	
Author	
Version number	

Table 1-3

Revision number	Revision authorised by	Date submitted to Environment Agency	Revision owner

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Section 1.0: Introduction

1.1 Site setting

The site is located at the end of Downing Road on the West Meadows Industrial Estate, to the east of the centre of Derby (SK 36815 36166). The estate itself is accessed via the A52 (Brian Clough Way) dual carriageway. The site is accessed via a security gate, from the public highway and is situated within land owned by the operator. The site area is approximately 0.6 hectares and is surrounded by 2.1m high palisade fencing.

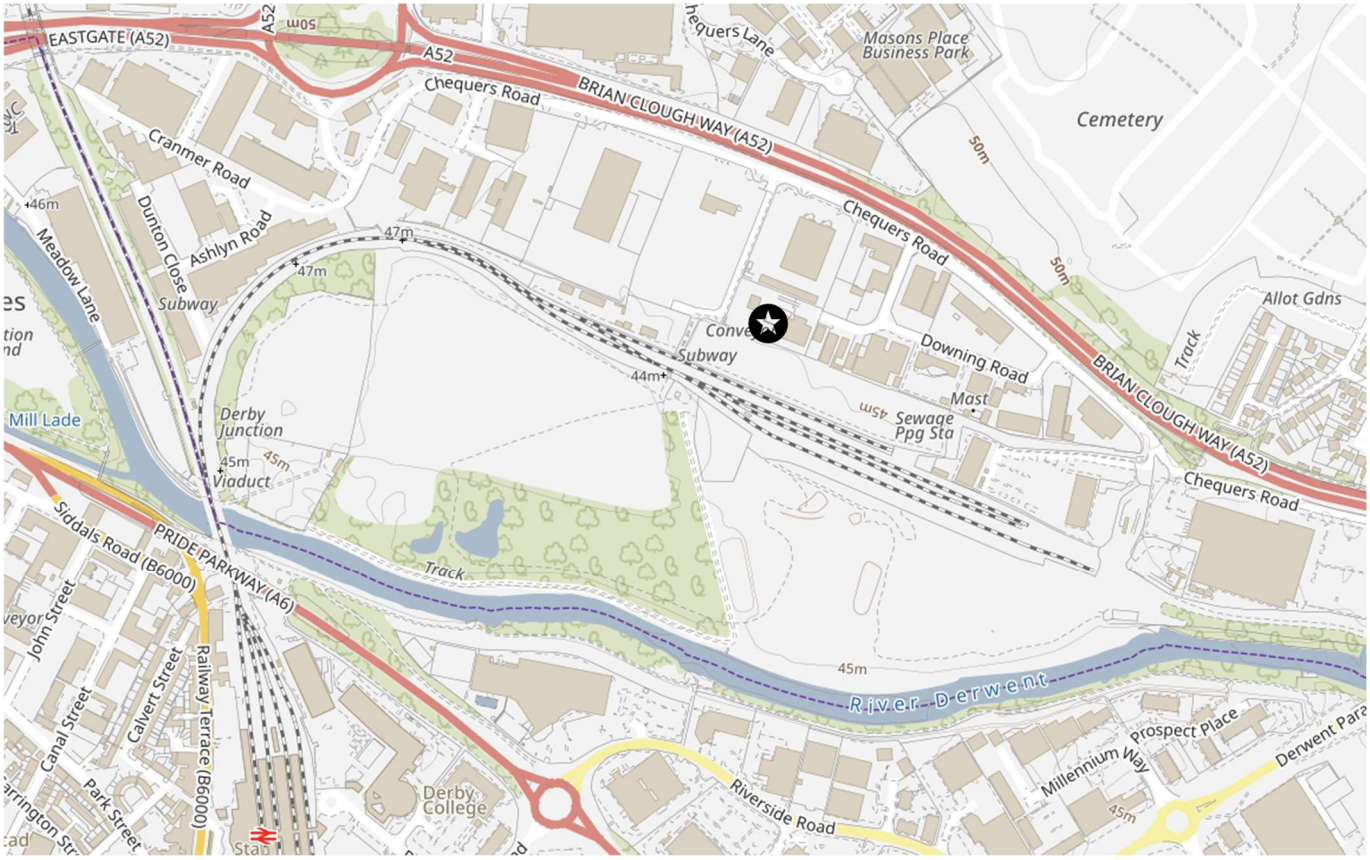
There is a mix of retail, industrial, transport, leisure, recreational and domestic properties within 1 000m of the site.

The Sanctuary LNR (a bird and wildlife reserve, formerly a gas works tip containing contaminated land) is located approximately 1 020m to the south-east of the site.

The site is 360m from the River Derwent, which lies to the South and flows W-E.

There is a SPZ1, 2 and 3 (centred at SK 36117 35788) located approximately 725m SSW of the site.

Figure 1-1 2ZLF site location



1.2 Site description

The site is a 105m x 60m flat area which incorporates a small car park, weighbridge, steel portal building (31m x 24m x 7m eaves height) with an attached flat roofed office (15m x 6m). The area over the weighbridge consists of designated waste reception and storage areas for the non-hazardous and (limited) hazardous waste activities as well as some of the processing plant. The storage for dry wastes and products is bays formed with concrete A blocks or concrete Lego blocks. The process equipment is partly outside but mostly inside the steel portal building.

The process involves 2 inlets – one for wet waste and one for dry waste.

The wet waste side of the process is the area which has been improved in readiness for treatment of the higher proportion of hazardous waste.

1.2.1 Dry waste

The dry waste is loaded into a hopper feeder using a front loader. The material passes under a magnet (for removal of metal) and then onto a star screen which ejects the oversize material (>100mm). The material then passes up a conveyor belt (under another magnet) and then enters the building.

The material drops into a log-washer where heavy material is augured up through a bath of water depositing on a screen where this stone and sand is graded into different sizes and deposited down a chute (+40mm) or onto a conveyor which takes the aggregate out of the building onto a stockpile. The floating light material (organics and trash) floats off the end of the water bath and is dewatered on a vibrating screen before exiting the building again on a conveyor.

The sand and water mix is pumped to the sand plant where it is pumped through a hydrocyclone with the underflow containing the sand deposited on a dewatering screen then a conveyor which takes the sand out of the building into a stockpile. The water and fines pass on to the thickener. Flocculant is added to the water to bring the fine solids together allowing settlement in the thickener before the sludge is removed via pump to the centrifuge system (also indoors).

1.2.2 Wet waste

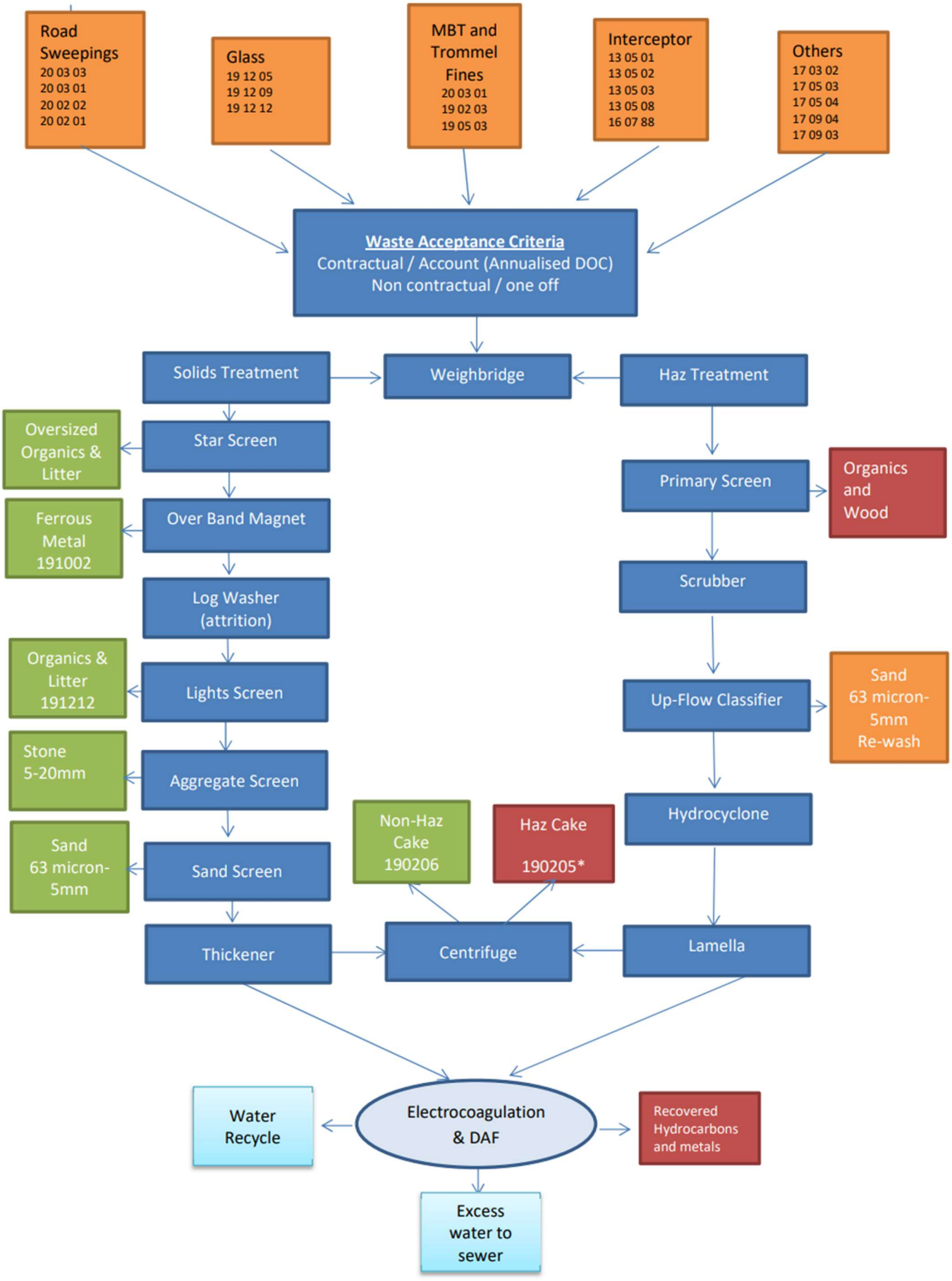
Outside of the building the wet waste from the wet waste discharge bay is loaded into the plant using a material handler into a screw conveyor. This is to be improved in future by the installation of a submersible pump that will feed the hopper directly from the storage tank. Due to the nature of the submersible pump, there will be a reduction in noise associated with this activity as the loader will not be needed to perform this operation.

The screw conveyor moves the material onto a primary screen where the material is washed with larger material removed for disposal. The underflow is pumped to the sand scrubber skid. On this skid the sand

is scrubbed with pressured water and then separated using a hydrocyclone and an up-flow classifier. The sand is removed via a screw. The water and fines pass to a lamella settlement unit where sludge is removed. A scraper also removes any scum/oil residue from the surface into an IBC. The sludge is currently held until the centrifuge is available.

As part of the permitted activity all water from the wet waste bay side of the plant is hard piped such that it has to go through the water treatment plant in the building consisting of Dissolved Air Flotation (DAF) and electrocoagulation. This removes suspended solids, oil and heavy metals. When the wet feed of the process is not being used the water treatment plant can clean the process water from the dry feed recycling.

Figure 1-2 Process flow diagram



Section 2.0: Maintenance and review of the OMP

The Odour Management Plan (OMP) is reviewed annually to ensure that the controls described are effective and reflect Appropriate Measures. Additionally, the OMP will be reviewed following any relevant changes in site operations or procedures that are likely to have implications from an odour generation/impact perspective.

The facility is operated in accordance with the permit, the EMS and ISO14001:2015 accreditation.
The OMP is stored electronically, with a version-controlled copy available on site.

The Site Manager (SM) is responsible for the OMP and ensuring all those connected with the operation are aware of its purpose.

2.1.1 Training

Training intervals are stated within the ISO14001:2015 procedures.

2.2 Relevant sector guidance on which this OMP is based

The OMP is based upon the following guidance:

- H4 Odour Management (Environment Agency, March 2011)[1].
- Guidance on the assessment of odour for planning (IAQM v1.1 July 2018)[2]
- Chemical waste treatment: appropriate measures for permitted facilities (Sept 2022)[3]

[1] How to comply (publishing.service.gov.uk)
[2] odour-guidance-2018.pdf (the-ies.org)
[3] Chemical waste: appropriate measures for permitted facilities - Guidance - GOV.UK (www.gov.uk)

Section 3.0: Sensitive Receptors

3.1 Sensitive receptor list

The facility is located within West Meadows Industrial Estate and is in proximity to other premises, as shown in table 3-1 below.

Table 3-1 Receptor list

Receptor ref	Land use	Direction from site	Distance (m)	Sensitivity to odour
1	Commercial	S	487	L
2	Commercial	S	467	L
3	Commercial	SW	685	L
4	Commercial	E	242	L
5	Commercial	N	58	L
6	Commercial	N	210	L
7	Commercial	NE	64	L
8	Commercial	E	348	L
9	Commercial	E	260	L
10	Commercial	SE	525	L

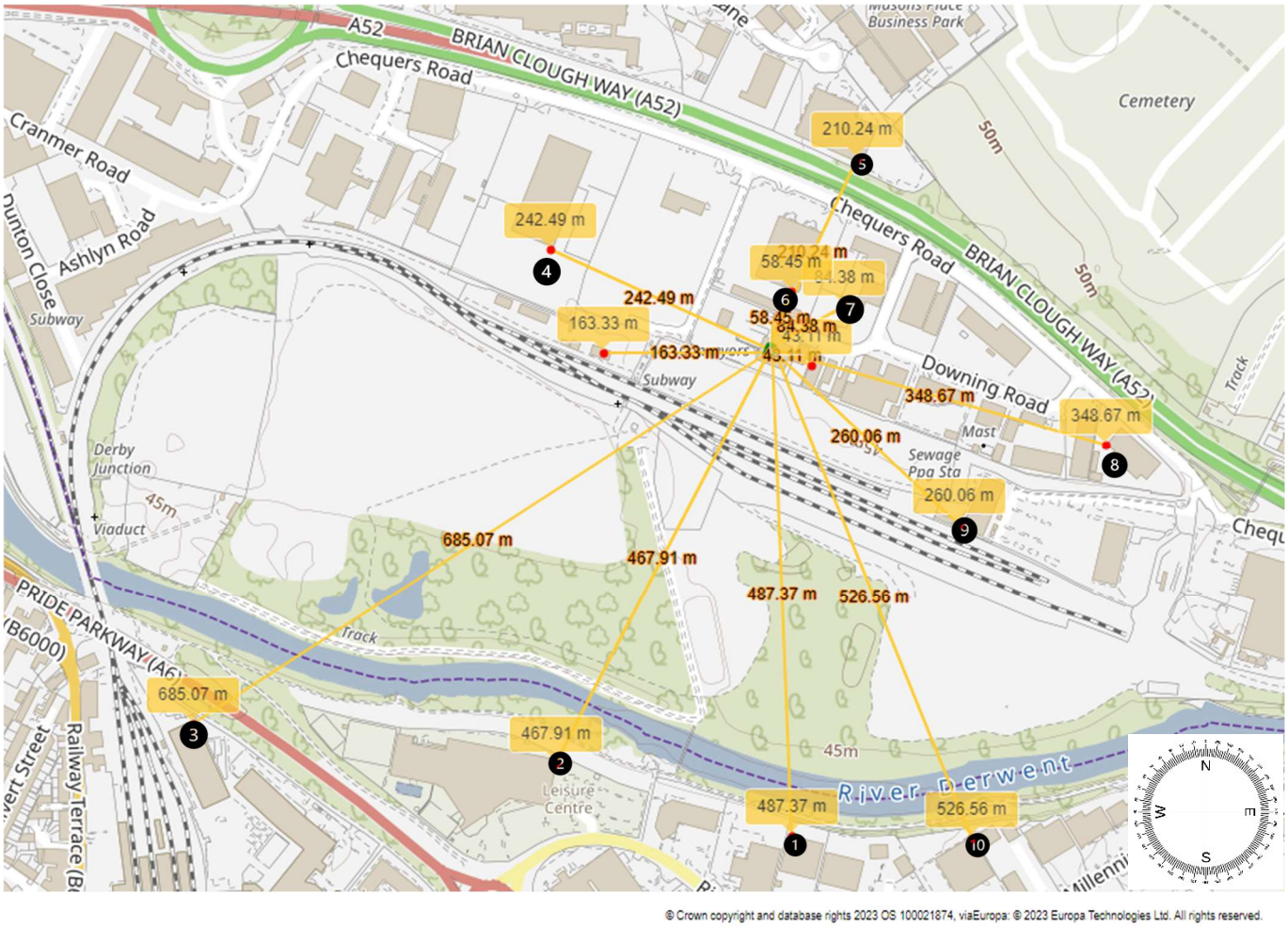


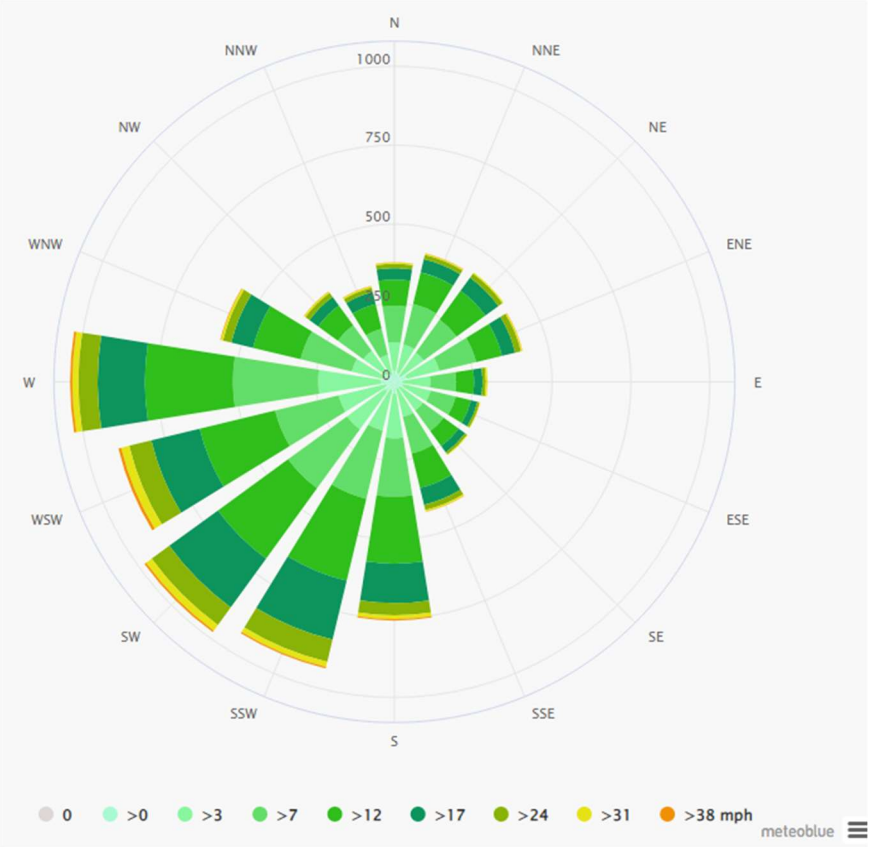
Figure 3-1 Map of site location and receptors

3.2 Wind rose and source of weather data

The closest meteorological station to the site, with recorded, publicly available historic weather data, is at Derby[4]. Assessment of the publicly available wind data from this station shows that the prevailing wind is southerly with the wind direction generally in the west to south quadrant. This suggests that an odour risk is most likely to the northeast of the site.

A wind rose of the meteorological data for a 5-year period shows the prevailing wind direction is from the southwest. There is also a fairly high frequency of winds from the north. The prevalence of winds from these directions means that those receptors that lie to the northeast and to a lesser extent, the south, of the site will be those most frequently 'downwind' of the site and therefore most likely to be impacted by any odour emissions from the site. Meteorological data is considered during routine odour surveys and prior to and during operations that have the potential to give rise to off-site odour impacts.

Figure 3-2 Wind rose



[4] Simulated historical climate & weather data for Derby - meteoblue

Section 4.0: Sources of Odour and Site Processes

"Biogenic-organic" odours cover a multitude of processes where organic material is being processed in some manner. The nature of these processes is such that the exact chemical composition of the odour is highly unlikely to be well characterised beforehand and is likely to consist of dozens of chemical species of different classes present at different (and temporally varying) concentration.

Feedstocks will only consist of waste types that are allowed to be processed under the site permit. Waste delivered to the site will be subject to stringent pre-acceptance and acceptance procedures, waste that does not meet the requirements will be rejected from the site.

4.1 Odorous materials entering and leaving site

The majority of imported feed stock materials are pre-booked, this enables the site to control the quantities of material scheduled to arrive at the site and ensures that the facility does not exceed its storage capacity. All waste materials are delivered to the facility via the road network. Only those wastes listed in Schedule 2 of the Environmental Permit are accepted at the facility in accordance with documented waste acceptance procedures.
Loads are only accepted whilst the site is open.

4.1.1 Solid waste streams

The facility accepts both sludge and solid wastes which are deposited within the designated reception sludge pit.

4.1.2 Liquid waste streams

Liquid wastes are also accepted; these are delivered by tanker into the liquid waste tank located adjacent to the treatment building.

Loads are only accepted whilst the site is open.

4.1.3 Collection procedures

2ZLF work closely with producers to ensure collections and deliveries work well.

Table 4-1 Odourous materials

Odourous and potentially odourous material	Odour potential	Quantity per day (max)	Maximum time held on site	Location on site	Comments
Road sweepings (non-haz)	Low	100 m^3/day	24 hours	Wet waste bay	No real odour – maybe a hint of compost and mineral oil
Road sweepings (non-haz)	Low	100 m^3/day	1 week	Stockpile	Compost type odour
Road sweepings (haz)	Medium	100 m^3/day	24 hours	Wet waste bay	Stored prior to treatment
Road sweepings (haz)	Medium	100 m^3/day	24 hours	Sealed tank	Stored prior to treatment

Odourous and potentially odourous material	Odour potential	Quantity per day (max)	Maximum time held on site	Location on site	Comments
Organics	Low	70 m^3/day	1 week	After treatment, material is stored in the relevant storage bay prior to despatch	Compost type odour
Filter cake (non-haz)	Medium	100 m^3/day	1 week	After treatment, material is stored in the relevant storage bay prior to despatch	Compost type odour
Inert products	Negligible	100 m^3/day	4 weeks	After treatment, material is stored in the relevant storage bay prior to despatch	No odour

Table 4-2 Feedstock inventory – assessment of odour potential

Type	Source	Form	EWC code	Typical composition	Abnormal composition	Likelihood of abnormal composition	Odour potential
Road sweepings (non-haz)	Industrial properties	Sludge	Various	Mixture of inerts and organics	Inherent variability (fresher wastes to older material)	May be more degraded with older material and/or warmer ambient temperatures. Wastes checked for	**Low/Med**

Type	Source	Form	EWC code	Typical composition	Abnormal composition	Likelihood of abnormal composition	Odour potential
						compliance with acceptance criteria.	
Road sweepings (haz)	Industrial properties	Sludge	Various	Mixture of inerts and organics	Higher PAH content would lead to rejection.	Low potential for large variation between deliveries given the typical source and constituents.	**Low/Med**
Filter cake (non-haz)	On-site Post-processing stockpile	Sludge	-	Clay/compost consistency	Elevated PAH would indicate treatment issues	Low potential for large variation between deliveries given the effectiveness of the treatment procedures.	**Low/Med**
Organics	On-site Post-processing stockpile	Solid	-	Twigs, leaves etc	May become stronger should anaerobic conditions be allowed to develop.	Product is relatively consistent, although subject to rainfall dilution.	**Negligible - Very Low**.
Inert products	On-site Post-processing stockpile	Solid	-	Sand	Elevated PAH would indicate treatment issues	Low potential for large variation between deliveries given the effectiveness of the treatment procedures.	**Negligible - Very Low.**

4.2 Overview of odorous processes and emissions

Table 4-3 Odourous processes and emissions

Potential odour source	Plan ref	Nature of emission	Potential odour intensity	Mitigation measures
Treatment building	1	Potential for odour release during treatment	Low	Treatment process enclosed
Waste feedstock processing (incl. tipping)	2	Potential for moderate odour release when material deposited	Low	Materials treated as soon as practicable after it is delivered. This ensures that only 'fresh' material is treated with minimal very short term, i.e., no more than 24 hours, storage, that will make sure that material does not degrade whilst in storage. Operational areas are maintained in a clean condition and regularly scraped/swept/ washed using pressure washer and/or a sweeper/squeegee on an ongoing basis.
Pipework	3	Potential for odour release should pipework develop a leak.	Low	Pipework is inspected regularly to ensure it always remains sealed. Breaches of pipework are dealt with immediately upon discovery and repaired as soon as reasonably practicable after assessing the relative environmental and health and safety risks involved.

Potential odour source	Plan ref	Nature of emission	Potential odour intensity	Mitigation measures
				Any spills resulting from a pipework failure are contained as quickly as possible.
Liquid transfer	4	The initial displacement of air associated with any filling process of liquid into a sealed container.	Low	Liquid is fully contained within the storage tanks and a network of sealed pipework. Any spillages of material will be captured in the drainage system and swept/cleaned as soon as reasonably practicable. Inspection of the digestate loading area is incorporated into the daily checks routine the cleaning and maintenance of which will be performed as required. All spillages will be dealt with as soon as reasonably practicable upon discovery.
Acceptance of incorrect feedstocks.	-	Elevated odour	Low	Wastes are accepted or rejected as necessary, in line with the 2ZLF Waste Acceptance Procedures. No waste shall enter the site until the waste has sufficiently satisfied the waste acceptance criteria. Staff trained on feedstock acceptance procedures.

Table 4-4 Odour emissions 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? If it occurs – 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*

To air						
Severely odorous wastes received	Site Workers Occupiers of domestic dwellings. Industrial and Commercial premises.	Atmosphere	Waste is brought to the site in covered vehicles. Vehicles will be required to arrive at the site in a clean state and all waste delivery vehicles will be covered. Strict waste acceptance procedures shall be in place for the facility and the facility and will not accept putrescible wastes. If deemed too odorous, the waste will not be accepted at the site. Should a load that contains severely odorous waste go undetected until it is unloaded, the waste will either be removed from the site or priority will be given to processing this waste first. If odour in a particular bay is likely to cause problems at offsite receptors, the operator may choose to cover this waste with a tarpaulin or similar, effectively sealing the waste. If the severely odorous waste is likely to impact the infrastructure, i.e. will leave behind odour within the bay, then the site will implement a full clean of the bay/infrastructure as appropriate.	Odour could potentially reach nearby dwellings or commercial premises when a strong wind blows in their direction. Management actions prevent this occurring.	Nuisance – having to keep windows closed, not being able to enjoy outdoor spaces, customer complaints etc.	Not significant

			If severely odorous waste is repeatedly received from the same producer, then they will be informed so that they can investigate potential prevention measures.			
Large quantities of waste received.	Site Workers Occupiers of domestic dwellings. Industrial and Commercial premises.	Atmosphere	The site manager will assess the volumes of waste present on site on a daily basis. If it becomes apparent that the site has accepted too much waste the Site Manager will assess whether the volume of waste can be processed in a timely manner. If the additional waste cannot be stored in accordance with permit limits or if the storage of additional wastes will lead to unacceptable odour emission, then the excess volume of waste will be transferred off-site to an alternative facility as soon as practicable, and the Environment Agency will be informed.	Odour could potentially reach the nearby dwellings or commercial premises when a strong wind blows in their direction. Management actions prevent this occurring.	Nuisance – having to keep windows closed, not being able to enjoy outdoor spaces, customer complaints etc.	Not significant
Handling of Materials (transfer) and treatment of wastes	Site Workers Occupiers of domestic dwellings.	Atmosphere	Under normal operating conditions, the site will operate a 'first in, first processed' system to ensure that the oldest waste within the storage area is processed first. This will help to minimise the waste	Odour could potentially reach the nearby dwellings or commercial premises when a	Nuisance – having to keep windows closed, not being able to enjoy outdoor	Not significant

	Industrial and Commercial premises.		retention times and will minimise odour production. The soil washing will take place within a fully enclosed treatment system that shall undergo regular cleaning and maintenance. The enclosed nature of the treatment ensures that odour is not discharged as it is absorbed into the water. The filtercake that is produced as part of the process is considered to be the most odorous part of the process as this is where the contaminants will be concentrated. If the filtercake is likely to lead to unacceptable offsite odour emissions, it will be contained within an enclosed skip and removed from site without delay.	strong wind blows in their direction. Management actions should prevent this occurring.	spaces, customer complaints etc.	
Plant breakdown	Site Workers Occupiers of domestic dwellings.	Atmosphere	The site will operate a planned preventative maintenance programme for all plant and equipment on site and will have back-ups of those items that could potentially lead to odour being produced, i.e., pumps etc.	Odour could potentially reach the nearby dwellings or commercial premises when a strong wind blows in their direction.	Nuisance – having to keep windows closed, not being able to enjoy outdoor spaces, customer complaints etc.	Not significant

	Industrial and Commercial premises.		Receipt of waste will cease if necessary, until machinery is functioning again. Water within the soil treatment facility will be reused on site for cleaning and dust control measures as well as within the soil treatment plant itself. All water on site is recirculated through the effluent treatment plant which is a key part of the soil treatment system where the contaminants are precipitated out into a filter cake and the filter cake is disposed of or is treated itself. Any necessary repairs and maintenance work will be carried out in a timely manner. If the plant is down for an extended period of time and the wastes could produce odour through their storage, the waste will be transferred off-site to an appropriately permitted facility	Management actions prevent this occurring.		
Power failure	Site Workers Occupiers of domestic dwellings.	Atmosphere	A back-up generator may be installed at the facility. If the waste delivery is from a 3rd party, the supplier will be notified as soon as possible, and the operator may decide to cease accepting waste.	Odour could potentially reach the nearby dwellings or commercial premises when a	Nuisance – having to keep windows closed, not being able to enjoy outdoor	Not significant

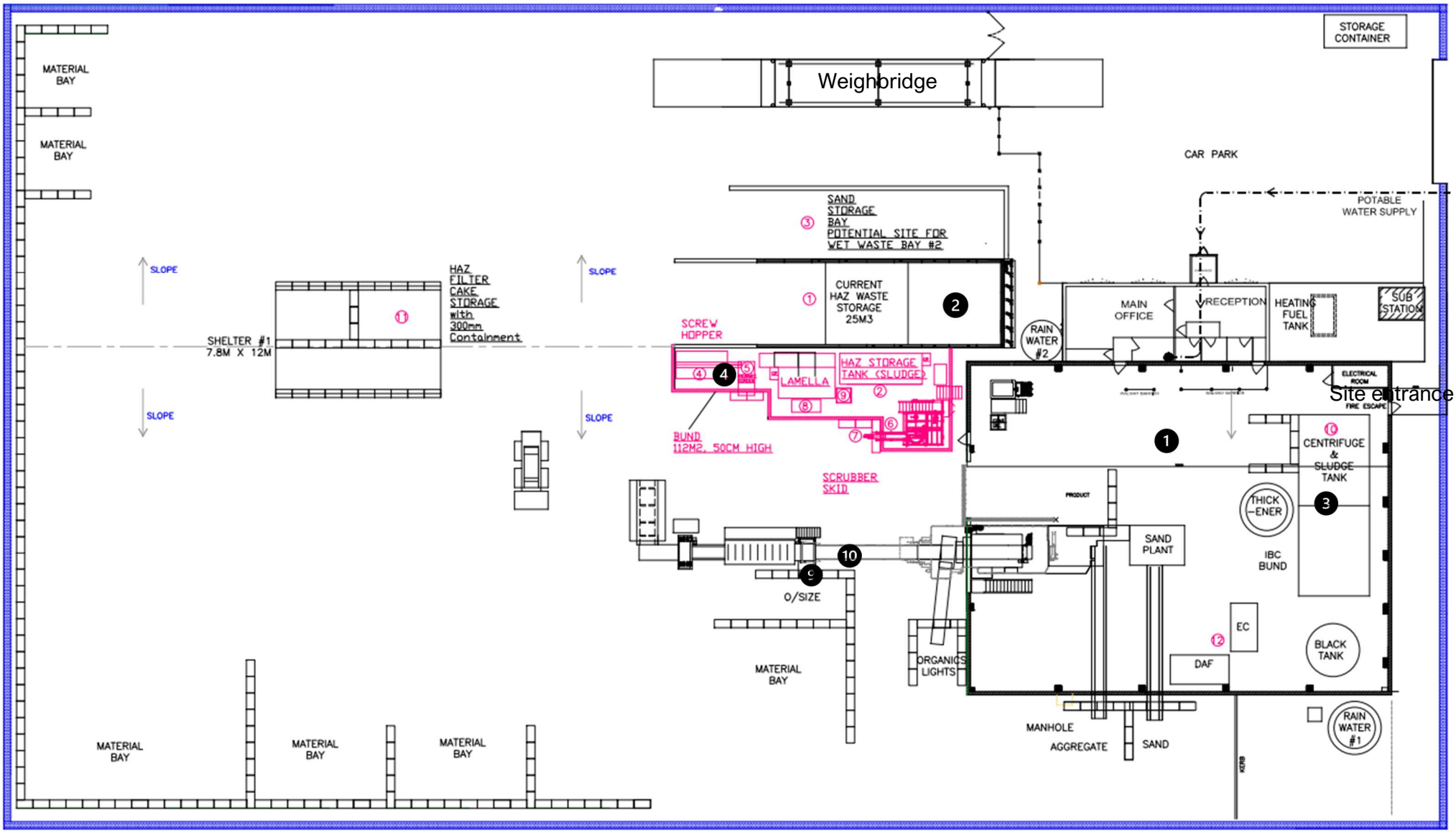
	Industrial and Commercial premises.		An immediate investigation and remedial action will be undertaken as required to determine the cause of the power failure. If the power failure will impact on the clinical waste fridge, then the contents of this fridge will be removed from site to an appropriate facility as a priority. If the failure is for an extended period, the site will cease or minimise the acceptance of waste, as necessary. If the plant is down for a period of over 5 days the waste will be transferred off-site to an appropriately permitted facility.	strong wind blows in their direction. Management actions prevent this occurring.	spaces, customer complaints etc.	
Restricted staff availability	Site Workers Occupiers of domestic dwellings. Industrial and Commercial premises.	Atmosphere	The site will have a staff resources plan that ensures that sufficient numbers of staff are available at all times to undertake each role. If required, additional staff may be hired on a temporary basis to cover the absent staff. If necessary, wastes will be transferred off-site to an appropriately permitted facility to reduce or remove waste volumes to a manageable level.	Odour could potentially reach the nearby dwellings or commercial premises when a strong wind blows in their direction. Management actions prevent this occurring.	Nuisance – having to keep windows closed, not being able to enjoy outdoor spaces, customer complaints etc.	Not significant

			If it is deemed that there are insufficient qualified staff to safely and properly run the plant, activities will be temporarily halted.			
Extreme winds and gales.	Site Workers Occupiers of domestic dwellings. Industrial and Commercial premises.	Atmosphere	Due to the infrastructure in place i.e., enclosed waste bays and the enclosed nature of the soil washing facility, it is unlikely that gales or wind will cause odour emissions. If extreme gales and winds could cause offsite odour emissions, then the site may cover the bays to prevent wind whip which will effectively seal in any odour.	Odour could potentially reach the nearby dwellings or commercial premises when a strong wind blows in their direction. Management actions prevent this occurring.	Nuisance – having to keep windows closed, not being able to enjoy outdoor spaces, customer complaints etc.	Not significant
Extreme cold/snowfall.	Site Workers Occupiers of domestic dwellings. Industrial and Commercial premises.	Atmosphere	If possible, snow will be cleared to enable normal access into and within the area. During snow events, infrastructure will be checked to ensure that any snow or freezing does not impact on the integrity of the bays or soil treatment facilities.	Odour could potentially reach the nearby dwellings or commercial premises when a strong wind blows in their direction.	Nuisance – having to keep windows closed, not being able to enjoy outdoor spaces, customer complaints etc.	Not significant

				Management actions prevent this occurring.		
Fire.	Site Workers Occupiers of domestic dwellings. Industrial and Commercial premises.	Atmosphere	Should a fire occur within the site, operations will be temporarily suspended and no further waste will be accepted on site. If necessary, wastes will be transferred off-site to an appropriately permitted facility.	Odour could potentially reach the nearby dwellings or commercial premises when a strong wind blows in their direction. Management actions this occurring.	Nuisance – having to keep windows closed, not being able to enjoy outdoor spaces, customer complaints etc.	Not significant
Flood	Site Workers Occupiers of domestic dwellings. Industrial and Commercial premises.	Atmosphere	Should flooding occur on site, the building will be assessed for breaches or likely damage. Operations may be temporarily suspended if flooding of the general site may lead to pollution and no further waste will be accepted on site. If necessary, wastes will be transferred off-site to an appropriately permitted facility.	Odour could potentially reach the nearby dwellings or commercial premises when a strong wind blows in their direction. Management actions this occurring.	Nuisance – having to keep windows closed, not being able to enjoy outdoor spaces, customer complaints etc.	Not significant

Poor Housekeeping	Site Workers Occupiers of domestic dwellings. Industrial and Commercial premises.	Atmosphere	The site manager will undertake inspections at the end of each working day to ensure that the site is clean, there is no waste build up on machinery and stockpiles are contained appropriately and any machinery which requires washing down has been washed down. If poor housekeeping occurs, the Site Manager will delegate members of staff to address the issues identified and may decide to cease accepting waste until such times as any identified issues have been mitigated. If poor housekeeping continues to occur on site, then all staff will be retrained and a daily task list may be instigated which a nominated member of staff will be required to sign off which will be checked by the site manager at the end of each day.	Odour could potentially reach the nearby dwellings or commercial premises when a strong wind blows in their direction. Management actions prevent this occurring.	Nuisance – having to keep windows closed, not being able to enjoy outdoor spaces, customer complaints etc.	Not significant

Figure 4-1 Site plan showing odorous process locations / odorous emissions



Section 5.0: Control Measures and Process Monitoring

5.1 Appropriate measures

The development and implementation of good working practices and robust control of the treatment and associated processes are key requirements to minimise the generation of odours and, for those which are unavoidable, these measures will reduce their subsequent release to atmosphere. This approach, i.e., the control of odours at source, is much more effective than trying to reduce odour impacts by mitigating against or improving atmospheric dispersion. As such, the hierarchy approach of preferred odour controls that will be applied is:

- Prevention of odour generation in the first place;
- Minimisation of odour releases;
- Abatement of emissions; and
- Dilution/dispersion of odours within the atmosphere.

5.2 General control measures

5.2.1 Inventory control

Inventory control forms a fundamental odour control strategy for the facility.

Most of the waste received at the site is done so under long-term contracts with various waste companies, local authorities and other local businesses and, as such, the operator has built up working knowledge and practical experience of the specific feedstocks accepted.

Detailed waste pre-acceptance audits are undertaken of all new customers before their waste is accepted at the site. These include completion of a proforma containing, among other things, information on the type and source of the waste, the length of time it has been stored at the site of production and details of any intermediate waste storage facilities used. A sample of waste is also requested (or inspected at the customer's premises) from new customers prior to acceptance so that the waste can be viewed for its suitability for the 2ZLF treatment process, and any necessary tests can be undertaken.

The process line capacity has been improved to ensure any maintenance or breakdowns does not result in a build-up of material in the wet waste reception bay. This prevents large volumes of material sitting on site for long periods of time, thus reducing the potential for odorous emissions.

5.3 Monitoring of on-site meteorological data

Monitoring and recording of meteorological data is an effective tool in the management of odorous emissions from the facility. The use of meteorological data is applied at the site for the following reasons:

- To predict periods when conditions for the dispersion of odour are likely to be poor, enabling additional monitoring to be scheduled and planned maintenance operations to be re-scheduled to avoid such times;

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

Table 5-1 Monitoring procedures for Appropriate Measures

Odorous and potentially odorous process / material	Appropriate Measure	Monitoring frequency	Monitoring procedure and optimum process parameters	Trigger level	Action taken if outside optimum process parameters
Acceptance of incorrect feedstocks	Waste is subject to Waste Acceptance and Rejection Procedure	Each load	Pre-waste acceptance and acceptance procedures in place. Visual and olfactory inspections performed prior to entry to site.	Delivery of highly odorous/incompatible material.	Reject load and inform waste supplier.
Waste storage	All deliveries of waste processed without delay	Constant – ongoing through shift	Visual inspection to ensure that process capacity is sufficient to process stored waste without delay.	Storage exceeds treatment capacity.	If reception storage is reaching capacity, waste deliveries will be stopped until process back under control.
Waste treatment	Oily waste is treated within an enclosed process in the treatment building.	Constant – ongoing through shift	Sludge/liquid is conveyed directly via a sealed pipe from the reception area to the process machinery and then pumped to the enclosed tank.	Equipment failures or excessive waste inputs may result in extended holding times for feedstock materials prior to treatment.	If treatment equipment malfunctions leading to storage reaching capacity, waste deliveries will be stopped until process back under control

Section 6.0: Odour Reporting

The key to understanding the principle of an offensive odour is that the mere presence of an odour does not necessarily mean that it is offensive. The characteristics of an odour that are considered when assessing its offensiveness are Frequency, Intensity, Duration, Odour Unpleasantness, and Location (FIDOL).

Frequency	How often the exposure occurs
Intensity	The perception of the strength of the odour
Duration	The length of any particular odour event or length of time exposed to the odour
Odour unpleasantness	The character of an odour as it relates to its hedonic tone (pleasant, neutral, or unpleasant) at the a given odour intensity
Location	The type of receptors e.g., housing, play areas, areas of particular sensitivity etc and also local meteorological conditions

Table 6-1 Odour characteristics

6.1 Complaints reporting

The Odour Complaint Report Form and Odour Complaint Procedure form part of the OMP to ensure that odour complaints are handled correctly and systematically and acted upon.

Complaints will be received by the SM either directly by telephone or email, via the Site Office or via the EA (telephone or e-mail). The complaint will be investigated promptly; this will usually be immediately but always within an hour of the SM picking up the telephone call/e-mail during operational hours. If complaints are received out of hours then an initial investigation will be undertaken with follow up by the SM the next working day, who will undertake the following actions;

- For complaints regarding odour the Odour Complaint Procedure will be followed and an Odour Complaint Report Form will be completed.
- The source of the odour will be investigated as soon as possible. An additional 'sniff testing' exercise will be performed in accordance with the methodology detailed in Appendix A. Any onsite odours will be recorded and, where possible, the likely cause of the odour identified;
- If no odour is detectable on site then a representative from site will go to the area from which the complaint was made to investigate any other reason for odours e.g. third party activities;
- For all complaints, reference will be made to the site activities at the time of the complaint. Further onsite investigations will be conducted to determine whether any abnormal operations are / were occurring. The following key potential causes of odour emissions will be investigated:
    - Are there any unusual characteristics evident in the waste on site (e.g. composition, age, condition etc.)?
    - Are/were waste reception and treatment processes occurring as per normal?
    - What are/were the weather conditions?

    - Are/were waste/product removal activities causing odour?
    - Are/were there any unusual activities taking place off site?
- If the odour is determined to be coming from the site, remedial action will be taken to prevent further odour emissions. In extreme cases the remedial action may include diversion of waste from the facility if the odour problem cannot be resolved within a reasonable timeframe.
- The complainant will be informed of the outcome of the investigation and any consequent remedial actions taken.
- Any odour problem emanating from the site will be notified to the EA and recorded in the Site Diary.
- All odour complaint forms (whether verified or not) and records of subsequent investigations and remedial actions will be made and retained electronically at the Site Office for at least five years. The SM shall ensure that they are readily retrievable and maintained as fit for retention.

Established, clearly defined and accessible communication channels are maintained for residents to report any odour issues, as necessary.

These include:

- Contact details (including telephone number and address) displayed on the main site notice board which is positioned near the site entrance;
- Ability for residents to report odours in person at the site office / weighbridge;
- Provision of a website providing a messaging facility; and
- Contact details include an emergency out of hours contact number for use when the site is not accepting waste.
- Consideration will be given to liaison with community members/ groups, as appropriate.

6.2 Pro-active odour monitoring

In order to assess the effectiveness of the control measures presented above and whether operational procedures are being followed, the following monitoring is undertaken;

- A daily programme of field measurements using ‘sniff testing’ to a procedure based on that outlined within EA H4 Odour Guidance;
- Daily monitoring of weather forecasts and on-site meteorological data;
- Monitoring of the processing equipment and associated infrastructure;
- Monitoring of odour abatement equipment in accordance with the preventative maintenance plan.
- Monitoring of complaints and other forms of community feedback.

The following report sections give further detail on how this monitoring is carried out.

6.2.1 Sniff testing

Monitoring of odour exposure by sensory field odour assessment, ‘sniff testing’, can be undertaken by the Site Manager to record the attributes of any odour.

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 for the following reasons;

- As part of the daily walkover surveys at the site boundary during normal operations, to confirm the effective performance of odour control measures in place;
- At the 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;
- If strong odour is detected at the site boundary and/or complaints are received, at designated off-site monitoring points and/or at the locations of other sensitive receptors as part of the Odour Complaint Procedure.

A summary of the extent and scope of the daily field odour monitoring is presented below.

Table 6-2 Summary of field odour monitoring at the site boundary

Parameter	Frequency of Measurement
Frequency of measurement	• Daily x 2 at 8.30 am, and 5 pm (during normal operations) • Reactive (in response to abnormal events or complaints)
Determinands	• Odour intensity (detectability) • Receptor sensitivity
Sampling location and duration	• Walkover survey of the site boundary (during normal operations) • At designated pre-defined off-site monitoring points in the event of strong odour detected at the site boundary and / or in response to complaints • At the originating address in the event of a complaint investigation
Sampling method	Odour Intensity scored from 0-6 as follows: 0 No odour 1 Very faint odour 2 Faint odour 3 Distinct odour 4 Strong odour 5 Very strong odour

	6 Extremely strong odour Receptor Sensitivity scored as follows: Low (e.g., footpath, road) Medium (e.g., industrial or commercial workplaces High (e.g., housing, pub/hotel, etc)

As detailed in the above table, two daily olfactory inspections of the site boundary are conducted during operational hours. All assessments are carried out by the SM or another nominated person who has been trained in the sniff test procedure and a record of this training is kept as part of the ISO.

To ensure that assessors are not suffering from odour fatigue and will be sensitive to odours, the first assessment is carried out first thing in the morning. The SM is not based in the treatment building where most waste activities take place and, therefore, is not considered to be particularly desensitised to the site's odours. However, alternative staff, who are not based on site and therefore not subject to any desensitisation, may be called in to undertake sniff test monitoring if deemed necessary. Food or drink (except water) is avoided for at least half an hour prior to undertaking the assessment and strongly scented toiletries are also avoided by the assessor. As colds, sinusitis or sore throats can affect the sense of smell, planned assessments will be re-scheduled or undertaken by someone else in the event of the assessor suffering from these ailments.

During an assessment a walk-around the entire site perimeter is conducted and observations made regarding the intensity of any odour detected in accordance with the methodology detailed in Table 6-2 above. A record is made of the meteorological conditions prevalent during the assessment and any relevant site-specific information is recorded, such as activities being undertaken, deliveries made, process operating parameters, any departures from 'normal' operating conditions etc. If any odour is detected, additional observations are made concerning the type and nature of the odour, including the likely source (any notable odours detected from other premises and activities in the vicinity of the site are also noted on this form).

The inspections will also pay particular attention to any issues or areas of concern raised by the EA, as necessary.

The results are recorded in the site diary.

If strong odour is detected at the site boundary and/or unidentified complaints are received (where the location of the complainant is not known), additional sniff test monitoring is undertaken at designated off-site monitoring points.

The off-site odour monitoring procedure uses the same methodology as detailed above, but the SM monitor odours at designated locations and records the results on this sheet. In the event of specific identifiable complaints being received, the sniff test monitoring would be undertaken at the complainant's address and the results recorded on the Odour Complaint Report Form as part of the Odour Complaint Procedure.

Immediate investigation/remedial action will be undertaken, where necessary, in response to the sniff test monitoring results.

6.3 Reactive monitoring

If strong odour is detected at the site boundary and/or unidentified complaints are received (where the location of the complainant is not known), additional sniff test monitoring is undertaken at designated off-site monitoring points.

The off-site odour monitoring protocol uses the same methodology as detailed in Table 6-2, but the SM monitors at designated locations and records the results on this sheet.

In the event of specific identifiable complaints being received, the sniff test monitoring would be undertaken at the complainant's address and the results recorded on the Odour Complaint Report Form as part of the Odour Complaint Procedure.

Immediate investigation/remedial action will be undertaken, where necessary, in response to the sniff test monitoring results.

Section 7.0: Abnormal Events

7.1 Introduction

This section of the OMP deals with the management and control of odours during maintenance and emergency situations.

It sets out the ways in which an action plan for abnormal event scenarios (including emergencies, maintenance, breakdowns, weather anomalies, etc.) will be operated.

This is a summary of the foreseeable situations that may compromise the operator's ability to prevent and/or minimise odorous releases from the process and the actions to be taken to minimise the impact.

7.2 Potential odour sources

Potential odour sources under abnormal operating conditions could include:

- 2ZLF plant infrastructure compromised (leading to odour release from storage tanks, pipework).
- Periods of maintenance.
- Absence of key staff.
- Flood.
- Fire/ explosion.

7.3 Action plan

The action plan s intended to be used by operational staff and referred to whenever an abnormal event occurs.

A tabular risk assessment approach has been employed in the evaluation of odour control techniques during maintenance and abnormal events. The table:

- Identifies the location and circumstances under which abnormal operational conditions or failures might arise;
- Summarises the potential impact or consequences of the identified abnormal event/failure situation; and
- Describes the mitigation response measures to be implemented. Most abnormal situations can be controlled in some way by effective management.

Solutions to mechanical problems will necessitate the replacement or repair of component parts.

With regards to essential items of equipment a list of spares required and the procedure for reordering has been developed as part of the Preventative Maintenance Plan and will be based on the manufacturers' recommendations of spares required, together with standby equipment for some critical items.

Breakdowns will be minimised, as maintenance of odour critical plant will limit such occurrences.

Where planned or emergency maintenance of plant items has to be carried out and there is a likelihood of odour being released to atmosphere in quantities sufficient to result in detection off site, a detailed risk assessment of the activity will be conducted, as part of which issues of odour generation, release and control are considered.

Any repairs required, identified because of inspection and maintenance procedures, will be implemented as soon as reasonably practicable.

Timescales for such maintenance/repair events may vary from a couple of hours (e.g., to clean out some pipework) to days (e.g., to order a new piece of equipment which is a non-essential spare).

In all cases appropriate measures will be employed to prevent and minimise odour from the activities beyond the site boundary during maintenance events.

Contingency measures for ensuring this are detailed in Table 7-1 below.

A post-event review will be conducted and, if necessary, modifications to the control measures, mitigation equipment, training and contingency actions will be implemented and the OMP updated accordingly.

Where an event is found to be due to deviation from operational procedures, staff will be re-trained in the use of procedures as necessary.

Table 7-1 Abnormal events

Abnormal event	Normal control measure	Recovery steps
Severely odorous wastes received	If there is a problem with a collection, 2ZLF employees take photos and notify the customer.	If highly odorous wastes are received, they will be rejected as a priority.
Mechanical or electrical failure / problem at site preventing operation of treatment line	Where there is a risk of backlogged materials becoming excessively odorous the site will be kept closed until waste can be processed or removed.	Instigate immediate investigation and appropriate remedial action as soon as reasonably practicable. The site will remain closed to further deliveries of waste until power is restored or the mechanical problem fixed and the waste backlog cleared. If the incident cannot be resolved within 12-hours the Site Manager (SM) will divert any further waste deliveries to another facility for processing until repairs have been completed. In the event of an accident/emergency the site Accident Management Plan will be followed.
Failure of pipework	Instigate immediate investigation and appropriate remedial action as soon as reasonably practicable.	The pipework where the leak is identified will be isolated and drained before replacement.
Restricted staff availability		Several staff are trained to operate the telehandler and other mobile plant, all other equipment is automated and can be monitored and controlled remotely
Plant breakdown		A supply of critical spares is maintained on site. The site will employ skilled fitters to promptly enact any repairs and additional plant will be hired where necessary.

		If spares or fitters are not available the relevant operations will be suspended if necessary to prevent significant increase in odour emissions or off-site impact In the event of an accident / emergency the site's Accident Management Plan will be followed.
Fire	Fire risk procedures will be adopted on site - refer to fire risk assessment.	In the event of a fire the site's Emergency Plan will be followed If required following a fire, operations will cease until all plant and infrastructure are restored.
Flood		The risk of flooding at the site is regarded as very low. If flooding does occur, operations will cease until all plant and infrastructure are restored.

Appendix A: Sniff Testing Protocol

The following methodology will be used to follow up complaints.

Where the test is carried out will depend on:

- Location of complaint;
- When trying to establish the source of an odour;
- Wind direction.

The assessment will involve walking along a route that has been selected either because of these factors, or in response to the conditions found upon arrival.

A note will be made of any external activities (such as agricultural practices) that could be either be the source of the odour, contribute to the odour, or be a confounding factor. Odour will become diluted and may change character as this happens.

Please note:

- Staff normally exposed to the odours may not be able to detect or reasonably judge the intensity of odours off-site. It might be better to use office staff or people who have not recently been working on the site to do this.
- Anyone who has a cold, sinusitis or a sore throat, is likely to underestimate the odours.
- To improve (or to check) data quality, get two people to do the test independently at the same time.
- Those doing the assessment should avoid strong food or drinks, including coffee, for at least half an hour beforehand. They should also avoid strongly scented toiletries and deodorisers in the vehicle used during the assessment.

Appendix B: Odour Complaint Report Form

Time and date of complaint:	Name and address of complainant:
Telephone number of complainant:	
Date of odour:	
Time of odour:	
Location of odour, if not at above address:	
Weather conditions (i.e., dry, rain, fog, snow):	
Temperature (very warm, warm, mild, cold or degrees if known):	
Wind strength (none, light, steady, strong, gusting):	
Wind direction (e.g., from NE):	
Complainant's description of odour: ○ What does it smell like?	
○ Intensity (see below):	
○ Duration (time):	
○ Constant or intermittent in this period:	
○ Does the complainant have 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:	
Do you accept that odour likely to be from your activities?	
What was happening on site at the time the odour occurred?	
Operating conditions at time the odour occurred. (e.g., flow rate, pressure at inlet and pressure at outlet):	
Actions taken:	

Form completed by:	Date	Signed

Intensity

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

Appendix C: Schedule of Odour Monitoring

Type	How often?	Person responsible	Method	Reason	Records	Response
Sniff test	Daily	Site Manager	Walk around installation boundary and perform sniff test. .	General monitoring to establish normal working conditions and check for odour emissions.	Site diary	If odour is detected investigate and establish source and take appropriate remedial action. Record the details in the site diary
Sniff test	Reactive	Site Manager	Walk around installation boundary and perform sniff test at, and around, complainant location.	Complaint response*	Site diary	If odour is detected investigate and establish source and take appropriate remedial action. Record the details in the site diary. If required, refer to Non-conformance/complaints procedures.
Sniff test	Upon odour release	Site Manager	Walk around installation boundary and perform sniff test at, and around, complainant location.	To establish and confirm odour source.	Site diary	Establish source and take appropriate remedial action. Record the details in the site diary. Inform regulator

**Complaint response monitoring can only be undertaken where complaints are received in a timely fashion.*