ODOUR MANAGEMENT PLAN (OMP)

Waterdale Shredding Building (Permit Reference: EPR/BP3793MQ)

NI2459
March 2024
Odour Management Plan
Waterdale WTS

rpsgroup.com

Document status

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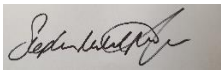
Stephen McAfee		March 2024

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1 INTRODUCTION

RPS has been commissioned by Hertfordshire County Council (HCC), to undertake an odour management plan (OMP) in support of the Proposed Waterdale Shredding Facility.

Where relevant, the OMP is intended as a basic procedure to be adopted by the Shredding Facility personnel, including any other companies operating within the Shredding Facility and Shredding Facility's operator, which is Hertfordshire County Council (HCC).

1.1 Site location

The site is located off Junction 6 of the M1 and is bordered by the Waterdale HWRC and a Golf Course. There is also residential property within 1000m of the facility.

The proposed development site is located north of Watford, adjacent to Junction 6 of the M1 motorway. The local area consists of a mixture of community, commercial and residential properties. Immediately to the north of the proposed development site is Junction 6 of the M1 motorway, to the east is the M1 north bound carriage way, to the south residential properties and open public space and to the east the North Orbital Road, St. Albans Road. The site location is illustrated below in Figure 1.

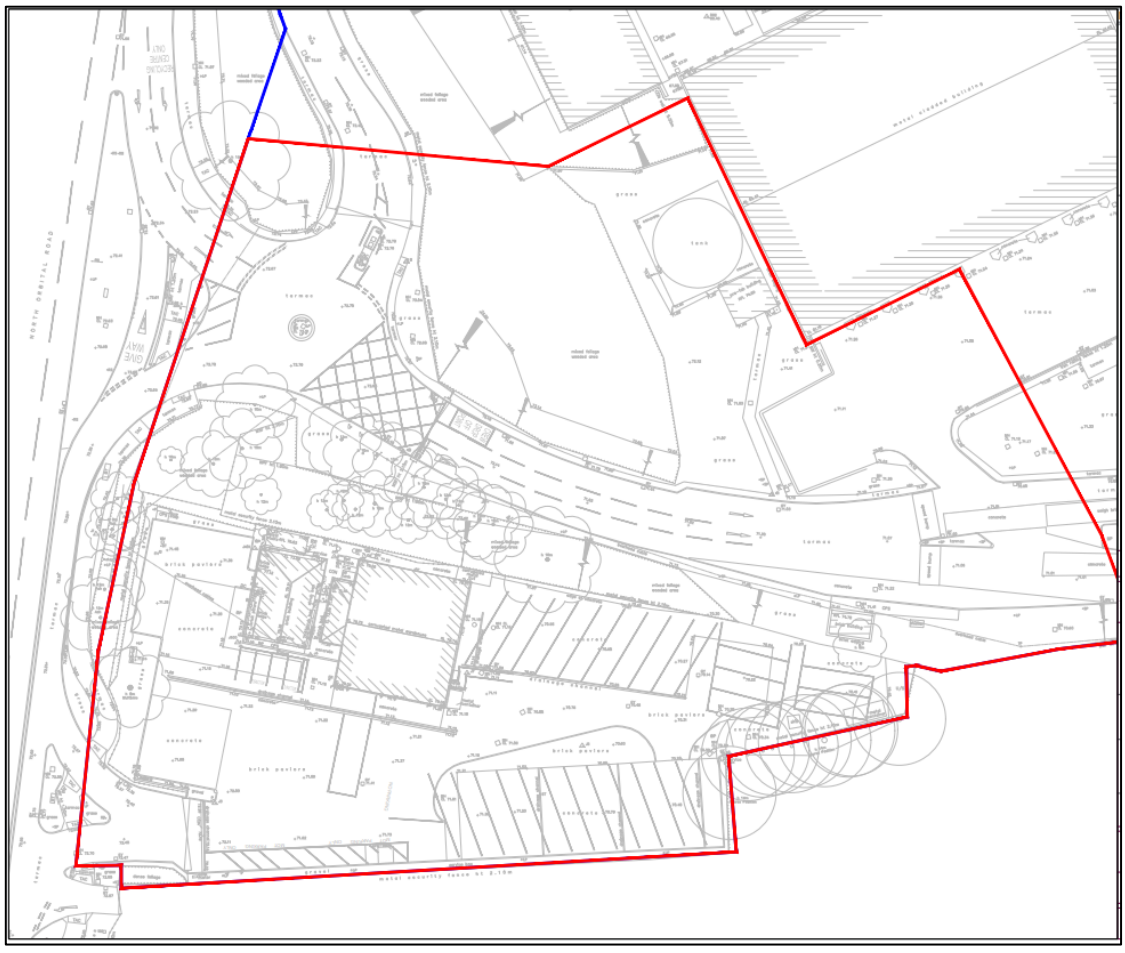

Figure 1: Site Location

2 ODOUR MANAGEMENT PLANS – PURPOSE AND SCOPE

2.1 Defining the OMP

An OMP is a live working document that formalises and describes how odour issues will be managed on the site. An OMP essentially forms part of the operational management system.

An OMP should show how odours are being managed and controlled so as to prevent or minimise the impacts. As well as covering normal operations, it should anticipate and plan for abnormal events and foreseeable accidents and incidents.

The control measures that can be applied will be different depending on whether the odour releases are from a point source or (as in this case) fugitive sources; but an OMP is relevant to both situations.

For sites where the dominant odour sources are fugitive or diffuse in nature, an OMP is crucial because:

- there is limited ability to capture and abate them using engineering odour control technologies such as scrubbers and filters;
- reliance is placed on using “good working practices” - these need to be written down, in a way that enables the document to be used as a practical working tool by the people doing the activities and the people responsible for the work. It is this formalised document that we term the OMP.

Additionally, OMPs complement engineering control measures (e.g. abatement systems) on sites with controlled point-source emissions, where there is a significant risk of any odour nuisance associated with plant failure and external factors outside the control of the operator (a quantitative approach to this type of odour incident being extremely difficult).

Therefore, OMPs have become a front-line tool for the effective control of odours at a wide range of sites, processes and facilities where there is potential for significant odour impacts.

An OMP is itself a control measure – a very important one – based on good management principles. It should follow basic management system principles:

1. **Plan** – identify releases (normal and abnormal conditions) and document the control measures for each,
2. **Do** – apply the control measures (routine and additional),
3. **Check** – verify if the measures are working well enough, review and revise to keep effective.

This is summarised in the flow diagram in Figure 2. It can be seen that this closely follows the classic approach for an Environmental Management System (EMS); indeed, there is no reason why an OMP should not be fully integrated into an operator’s EMS or Quality Management System (QMS).

It can also be seen that working to an OMP is an iterative process which, if followed properly, should be effectively self-regulating and should require little detail intervention from outside:

- it requires the operator to take the appropriate action to bring any problems under control or else (ultimately) suspend operations; and
- if there is an odour problem, it should be picked up (through monitoring, complaints system) and the control processes reviewed and tightened to deliver the objective (no significant odour impact off-site).

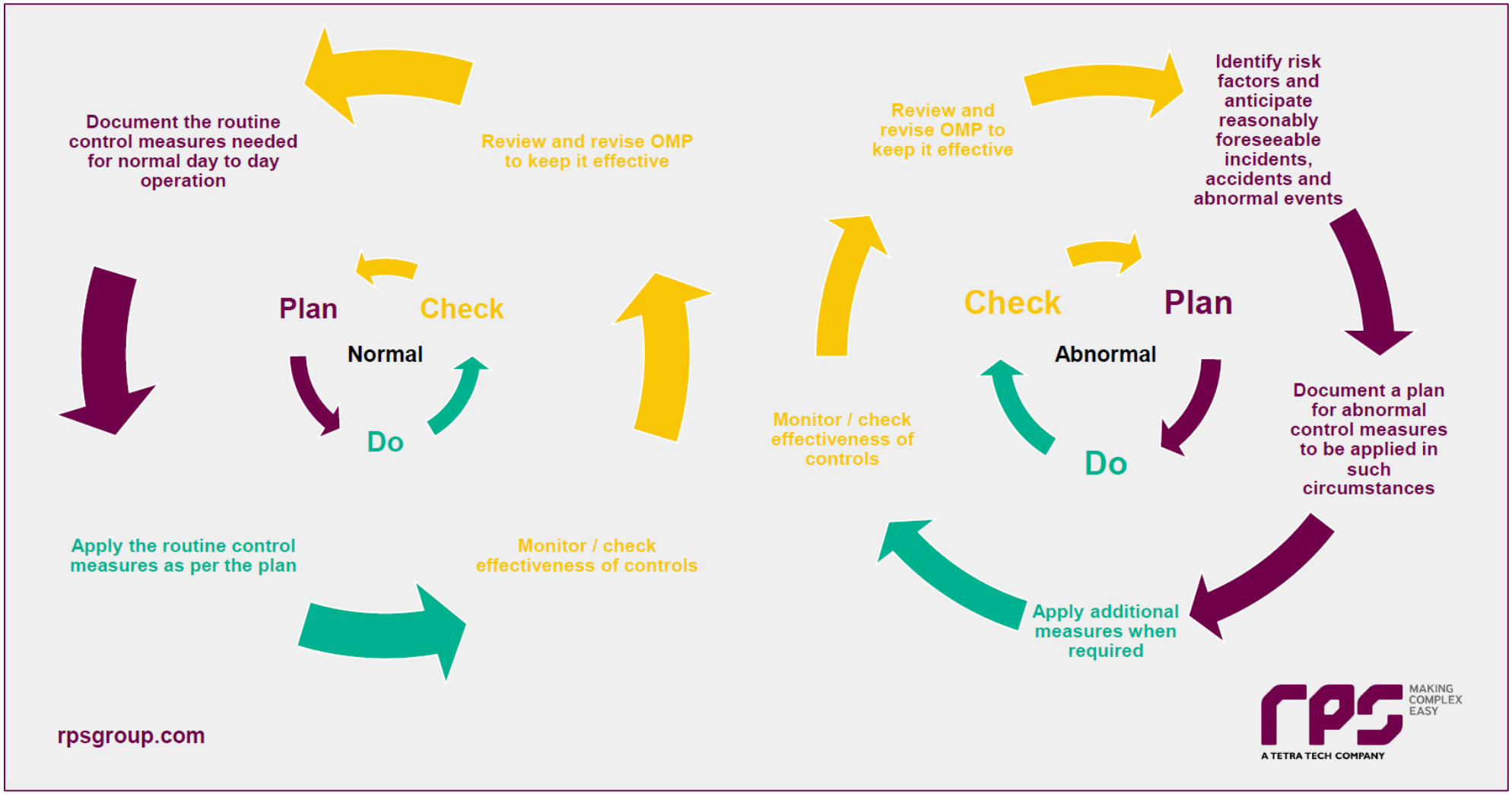

Figure 2: Plan Check Do Flow Chart

3 ODOUR MANAGEMENT PLANS – PERMITTING REQUIREMENTS

3.1 Environmental Permits

If odour from an Environment Agency regulated process may cause odour pollution or annoyance beyond the site, then it is likely the Environment Agency will require a written OMP. The current form of odour condition within Environmental Permits comprises of an odour boundary condition (specifically condition 3.2.1 of the permit and the requirement that emissions from activities shall be free from odour at levels likely to cause pollution outside the site.).

The Agency in its technical guidance note H4 Odour Management[1] provides advice on management of odour to comply with Environmental Permits and aspects that should be dealt with in an OMP.

This OMP provides information on the measures to be implemented to control odour emissions from the waste transfer station (WTS). It is based on best-practice requirements in the various government and professional guidance documents on OMPs[2] and includes the Agency's requirements for OMPs as part of the permitting process, as described in Environment Agency H4 Odour Management guidance.

All these guidance documents stress that the OMP should be risk-based, with the level of depth, complexity and sophistication of the OMP being dependent on the complexity of the processes and the potential impact of the odour on neighbouring premises: where a process may produce particularly offensive odours, then the OMP will necessarily be detailed and thorough; conversely, for a process with a lower potential odour impact, a simpler OMP will suffice.

To fully meet these requirements, this OMP includes the following:

- A process description, particularly describing odorous, or potentially odorous, activities or materials used;
- Identification of all the release points for each of the activities and their locations;
- Identification of the sensitive receptors within the area of influence that could be impacted;
- A description of the routine mitigation/control measures that would be used day-to-day under normal operating conditions in the absence of any unusual risk factors;
- Identification of possible risk factors (e.g. equipment/control failures, abnormal/unintentional situations, adverse weather conditions, spillages, etc.); and a listing of the consequences for odours of these risk factors;
- A description of the additional measures that will be applied during these periods to deal with these risks and any reasonably foreseeable incidents and accidents;
- A list of the actions in detail and who is responsible for carrying them out;
- A description of what would trigger the further action/additional measures;
- A description of the roles and responsibilities of personnel on site (e.g. organisational chart), and the training and competence of staff in odour-critical roles;
- Details of how the following will be carried out, and who has been assigned managerial and operational responsibilities for them: implementing and maintaining the OMP; responding to odour-related incidents; planned maintenance and repair and the keeping of essential odour- critical spares; regular review of the effectiveness of odour controls (including the OMP itself); engaging with neighbours and communicating

[1] Environment Agency – How to comply with your permit – H4 Odour Management, 2011.

[2] SEPA, Odour Guidance (January 2010).

Defra, Good Practice and Regulatory Guidance on Composting and Odour Control for Local Authorities (March 2009).

Defra, Odour Guidance for Local Authorities (March 2010).

with relevant interested parties; and keeping records of all activities and actions relating to odour and the OMP.

This OMP takes all of the above into account within the following structure:

Section 4 – Sources of Odour;

Section 5 – Management of Each Source;

Section 6 – Actions Taken if Odorous;

Section 7 – Stopping Waste Deliveries to Site;

Section 8 – Monitoring Procedure;

Appendix A - Odour Monitoring Protocol;

Appendix B - Odour Incident & Routine Monitoring Form & Odour Incident Follow Up Form;

Appendix C - Location Plan 794-NI-RWM-IBR1405-0001-01 & Receptor Plan 794-NI-RWM-IBR1405-0002-01;

Appendix D - IBR1349-102A Permit Variation Boundary Change.

4 SOURCES OF ODOUR

4.1 Introduction

This section of the OMP contains:

- Site overview – a description of the site function and layout, neighbouring communities and sensitive receptors;
- Odour source inventory – a summary of the main sources of odour, their locations and the materials/activities involved, and the characteristics of the odour sources (e.g. fugitive or controlled, point, area or volume, release height, likely odorous compounds, quantities likely to be released, pattern of release, method of control).

4.2 Site Overview

The proposed facility is an extension to the existing operations at the Waste Transfer and Recycling facility at Waterdale which will increase the area available for the receipt of the waste that is already being delivered. A new building will allow the processing (shredding) of some material to improve efficiency and meet HCC's ambition for zero use of landfill as a final disposal route by 2030.

The construction of a new, purpose-built structure, immediately adjacent to the existing operation, would enable HCC to separate all of the bulky waste currently accepted (household items such as furniture, carpets and mattresses) and shred these materials prior to onward transfer to the contracted final treatment facilities.

The proposed development plans and elevations can be seen in Appendix A.

4.2.1 Shredding Facility

The shredding machine will reduce waste volumes for more efficient and sustainable onward transfer of this material to treatment facilities. The shredder has capacity to process daily waste intake volumes in approximately 2–3 hours and shredding shall only be undertaken during the working day.

4.2.2 Site Entrance

The site entrance for the proposal is at the existing site roundabout and the use of the existing coachyard entrance to serve the proposed shredding facility as part of a one-way system which will ease the pressure on the access to the waste transfer site, reduce queuing on the A405 and improve traffic management and road safety.

4.2.3 External Activities

All vehicles are to enter from southwest entrance and take a weight measurement at the first weighbridge. The vehicle will continue around the site and be guided to an available entrance (via a traffic light system and/or manually by an operator) which it will reverse into, and the fast-acting doors will close again before any waste is dumped/collected. After waste disposal/collection the door will again open and the vehicle will leave the site through the northern exit, taking another weight measurement at the second weighbridge.

The South and Southeast areas of the site will provide queuing for vehicles if the service area is not clear. Additionally in some cases a vehicle carrying two containers of waste may arrive on site. An area to the east is provided where the vehicle may drop one covered container before entering the building to tip the remaining container. Following this the vehicle will switch containers, tip the second and then leave the site with both now empty containers reattached.

4.2.4 Hours of Operation

The hours of operation and hours of deliveries are as follows:

- Monday to Friday 7am – 8:30pm
- Saturday 7am – 4:30pm
- Sunday 8am – 4:30pm
- Public Holidays 7am – 4:30pm

4.3 Neighbouring Communities, Other Odour Sources and Sensitive Receptors

There are a number of sensitive residential receptors in close proximity to the proposed redevelopment site. The closest sensitive receptors are located to the south at Farriers Way, Fullers Avenue and Bucknalls Lane and to the east at Barnes Wallis Way. The majority of sensitive receptor[3] are located to the southeast of the site.

The Agency provides guidance on where more detailed consideration of odour impacts from certain waste treatment facilities would be required, based on the distance from the facility. There is no guidance for this specific type of facility, but for composting facilities the guidance states that more detailed consideration of odour impacts would be required where there are sensitive receptors within 250 m of the facility.

Additionally, the Agency has applied a distance function (set at 250 m) as a cut-off for composting sites seeking to obtain permits using Standard Rules. This distance is applied irrespective of the throughput of the compost plant. That guidance may be primarily concerned with bioaerosols but is good practice from the point of view of odour impact control, too. Defra's 2009 document "Good Practice and Regulatory Guidance on Composting and Odour Control for Local Authorities" states that: *"The provision of a sufficient buffer zone or set back distance between a compost plant and the nearest sensitive receptor is desirable. A sufficient set back distance provides emissions from the site with a zone in which residual odour from the site can dilute and disperse before reaching a receptor".*

The potential for odour emissions to impact at sensitive locations depends significantly on the meteorology, particularly wind direction, during release. In order to consider prevailing conditions at the site review of historical weather data was undertaken. Prevailing wind direction is west southwestern (WSW), as show in the wind rose in Figure 5.

[3] The closest receptor to the proposed development building boundary at a distance of 212.4m.

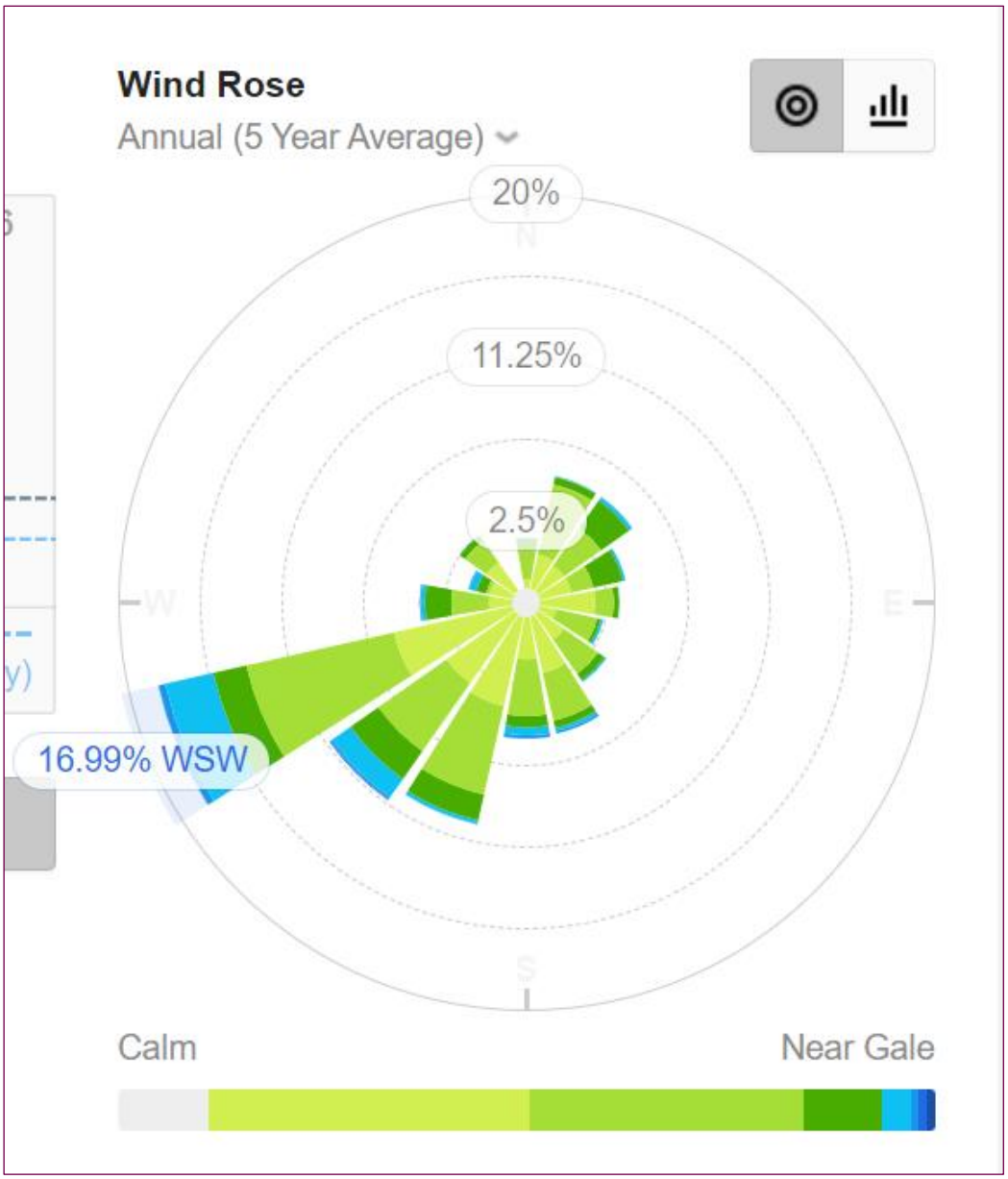

Figure 3: Watford Wind Rose (Annual 5 year Average)

4.4 Type of Odour

The sources of odour on the waste transfer station can be from the waste itself or from other operational sources, all are listed below:

- **Waste;**
- **Waste drainage - foul water;**
- **Domestic foul water;**
- **Surface water;**
- **Plant, and;**
- **Haulage.**

These odours can occur in the following circumstances:

- **Waste -unloading, storage & loading.**
- **Waste foul water- whilst collecting in a sump or drain.**
- **Domestic foul water-from the drains**
- **Poor surface water movement leading to stagnation.**

A discussion of the four identified odour sources is set out in the following sections.

4.5 Waste

The waste that is delivered to Waterdale waste transfer station is from:

a. Kerbside residual waste from within Hertfordshire, delivered by the District Councils - Residual and MDR. The residual waste will be the remaining household waste following source segregation but can contain any of the separately collected fractions where this has not been separated out. It is likely that food waste and food packaging is the most odorous element of the domestic refuse collection although food waste collections are provided in the Districts and so this risk is reduced. However, the extent to which odours are emitted from the waste is dependent on the level of separation at the household, the type of waste put in the residual waste bin at the household, different times of year (e.g. Christmas), and different weather conditions.

b. Similar wastes from Commercial and Industrial premises. All wastes will be a heterogeneous mix of waste from within the confines of the lists of wastes specified in the Permit. The Commercial and Industrial waste is more carefully defined by the nature of the industry and will be regulated by FCC when identifying customers to limit risk of malodorous waste. Commercial and industrial waste could be odorous even if it complies with the lists of wastes, but it is likely to be predicable and therefore manageable.

c. Clinical wastes collected by District Councils from private properties and trade properties, i.e. dentist surgeries

4.6 Waste Types and EWC codes

The European Waste Catalogue (EWC) List of Wastes is a standardised way of describing waste. The EWC is used when completing:

- waste data returns,
- waste transfer notes, and
- hazardous/special waste consignment notes.

The EWC is a list of waste types which categorises wastes based on a combination of what they are, and the process or activity that produces them. The EWC is divided into 20 chapters. Waste types are assigned a six-digit code:

- The first two digits are the chapter,
- The next two are the sub-chapter,
- the last two are the specific to the waste type,
- Hazardous/special wastes are identified using an asterisk.

A complete list of waste types and associated EWC codes are detailed in Appendix E.

4.7 Waste Drainage Foul Water

This source of odour is the dirty water that may collect in the drains in the waste transfer station. This will be any liquid fraction of the waste that seeps from the waste. The list of wastes specifically excludes liquid wastes however these may be delivered, especially in the domestic residual waste collections. However, the absorbency of the remaining waste usually keeps liquid waste within the waste mass.

4.8 Domestic Foul Water

Domestic foul water will be generated from the office section only and will be discharged to the foul water sewer in a sealed system.

4.9 Surface Water

Surface water (non-waste storage areas) will be collected and pass through an oil interceptor prior to being discharged to the sewer.

5 MANAGEMENT OF EACH SOURCE

5.1 Waste

The waste is managed in order to mitigate any odours that arise. The controls in place on this site are:

1. Closed or sheeted delivery and dispatch vehicles will be used to ensure waste is kept contained in the vehicle during transit.
2. All residual waste is tipped inside the waste transfer building.
3. The waste transfer building has roller shutter doors to assist in containing the air in the building overnight.
4. The waste transfer building roller shutter doors will be shut overnight, to reduce escape of odours and to assist in the operation of the Dax Air Science de-odouriser system.
5. Waste will be inspected on arrival for any obvious signs of exceptional or problematic malodours.
6. A mist air system will be in place and will be operated to minimise dust emissions and will have an odour masking agent added to the mist to minimise any odours leaving the interior of the shed.
7. A Dax Air Science de-odouriser is installed and is on 24/7 - this reduces the development of odours overnight.
8. Wastes identified as particularly odorous on arrival and considered to be a potential source of detectable odour, will be removed from site a soon as possible.
9. Odorous material on site will be kept to a minimum, rotating stock to prevent a build-up of older waste.
10. Inspection and maintenance of the building fabrication takes place to avoid fugitive emissions -this is included in regular inspections.
11. A good housekeeping regime is in place in the waste transfer station building.
12. Odour monitoring will be undertaken and recorded daily in the site 'Daily Diary'.
13. Waste types for acceptance are controlled by the Permit conditions and any manual inspections of waste tipped will confirm acceptance.
14. Staff are suitably trained in the conditions of the permit and integrated management system including the contents of this OMP where applicable.
15. Non-conforming materials are segregated and stored at a designated area within the building prior to removal off site to an appropriately licensed facility as soon as practicable.
16. The Environmental Management System documentation is reviewed regularly to ensure it remains appropriate and up to date, including the Working Plan and this document.
17. Internal reviews of environmental performance will be carried out. All complaints are recorded on Safeguard which allows visibility by senior management and the Environment Dept.

Each situation is different, and each will be treated as considered appropriate from the measures listed above. Should the above measures be deemed to be failing, further internal and external discussions will take place to manage and resolve the odour issue.

5.2 Waste Drainage Foul Water

The waste stored in the waste transfer building (and shredding building) may become very finely wet from the mist air system or may itself be wet before arrival. Subsequent water that may leak from the waste stockpiles is expected to be minimal.

5.3 Domestic Foul Water

Domestic foul water from the offices and welfare facilities goes directly to a closed sewer connection and so to risk of odour is limited to emergency situations only. Liquid from the car park is also directed to sewer.

5.4 Surface Water

The surface water collected on site is controlled via drains and leads to sewers.

6 ACTION TAKEN IF ODOROUS

6.1 The Process

The process of managing odour at the Waste Transfer station can be divided up in to the following sections;

6.1.1 Record

Firstly, the incident is noted. The odour incident can be either a potential odour incident or an actual detection that is sufficient to warrant attention, whether it be an internal staff detection, a routine monitoring detection or an external notification. Records will be in the site diary and recorded on the FCC Safeguard System.

6.1.2 Investigate

Secondly, the incident is investigated. The investigation will assess the source of the odour, the nature of the odour (is it a nuisance, is it pervasive, is it offensive, is it treatable) and the likely frequency with which this odorous waste might arrive at the site.

6.1.3 Decide

Thirdly, a decision would be made as to how to treat the odour or the cause of the odour (for example more cleaning, mending broken manholes covers etc). The mechanisms of treating the waste are detailed in Section 5 above.

6.1.4 Action

The course of action decided upon above would be implemented as appropriate.

6.1.5 Monitor

The outcome of the action taken would be monitored to detect whether appropriate action has been taken. Monitoring can be one or more methods, internal staff sniff test (remembering operating staff may be desensitised}, on site sniff test, perimeter sniff test and off-site sniff test.

6.1.6 Report

The above processes would be recorded. Records can be used to review the frequency of incidents, to discuss and improve management techniques, to review severity of incidents, to detect trends, to inform the review of the HI risk assessment of the permit application, to inform a review of this paper and to demonstrate effective management. **See EMS Odour appendix A below.**

7 STOPPING WASTE DELVIERIES TO SITE

Stopping waste deliveries to site is an important management control tool in the control of odour generation and for the compliance with Permit conditions. The reasons for ceasing a waste import need to be compelling and the following are a guideline only as to when this course of action would be considered.

The importation of waste would cease when it is deemed that further importation of a single waste delivery would;

- not be mitigated by the management techniques specified in sections 5 & 6,
- cause an odour nuisance, breaching the conditions of the permit, and
- exacerbate an existing odour generating and nuisance causing problem.

Depending on the circumstance, waste imports would be ceased on different scales, such as:

- A specific waste type,
- A specific waste supplier,
- All waste types, or
- All waste suppliers.

Waste that is prevented from being delivered to the waste transfer station due to the odour that it releases needs to be (before it is returned to site for potential acceptance);

- Treated or managed before despatch to reduce or eliminate its odour generation,
- Treated or managed before despatch to reduce or eliminate its odour offensiveness,
- The waste production process needs to be investigated to identify whether the waste could be reduced or eliminated at the point of production, and
- Dispatched directly to a waste management facility that can handle the waste without causing a nuisance or breaching its permit conditions.

These measures are not under the direct control of FCC Environment; however, discussions can take place in order to assist the supplier with understanding the permit constraints of the waste transfer station. Contracted District Council waste would be managed by FCC in conjunction with the County Council and should domestic waste be considered to be causing a significant issue, such as one likely to require any of the measures above to be taken, then negotiations would take place with the District Council to prevent further occurrences.

8 MONITORING PROCEDURE

To carry out the assessment, a member of staff uses his own sense of smell to try and detect odours, which may arise from the site. The frequency of assessment is specified in the Environmental Management System for odour assessment but should be no less than once a day on operational days and in response to specific complaints.

If an odour assessment indicates that an odour is being emitted from the site, the site will be investigated for the source. If the source is detected or can be attributed to a process, action to eliminate that odour will be undertaken.

All odour assessments will be recorded on the Odour Incident & Routine Monitoring Form or in the site diary and follow up notes are recorded on the Odour Incident Follow Up Form. These records will be stored on site or electronically.

See EMS Odour appendix A and B below.

Appendix A
Odour Monitoring Protocol

OBJECTIVE

To provide a clearly written procedure for a consistent, albeit subjective, assessment of odours around the site.

General

To carry out the assessment, a designated person uses his own sense of smell to try and detect odours, which may arise from the site. The frequency of assessment is specified in the Environmental Management System for odour assessment but should be no less than once a day on operational days and in response to complaints.

If an odour assessment indicates that an odour is being emitted from the site, the site will be investigated for the source. If the source is detected or can be attributed to a process, action to eliminate that odour will be undertaken.

All odour assessments will be recorded on the odour assessment form or in the site diary and these will be stored on site or electronically.

SCHEDULING ROUTINE ODOUR ASSESSMENTS

There are two guidelines to be followed for the scheduling of odour assessments, and these are;

- Vary the odour assessment times to cover all the differing activities that take place on site.
- If the time is close to a coffee or lunch break, schedule it to before rather than after.

ROUTINE ODOUR ASSESSMENT METHOD

The assessment involves the designated person visiting the identified odour assessment areas located around the site. These are identified and from the HI risk assessment and a map is created and attached to this Management System. At each site the designated person will;

- Park the vehicle (if applicable},
- Turn the engine off (if applicable),
- And get out of the vehicle (if applicable).

The designated person will then assess the air by:

- Remaining in the locality for a minimum of one minute,
- Breathing normally in order to detect odours and
- Identify the odour type (e.g., green waste, sewage, agricultural)
- Make an assessment of the intensity as guided by the key to the Odour Incident & Routine Monitoring Form.

The designated person will;

- Make an assessment of the sensitivity of the area, as guided by the key to the odour assessment form, where the assessment area is not a routine assessment point. The routine monitoring points have already been assessed for their sensitivity.

Whilst undertaking the assessment the designated person must:

- Observe the locality for indications of other activities that may be causing another odour.

Having completed the odour assessment, the designated person will;

- Complete the Odour Incident & Routine Monitoring Form.

- Report the conclusions to the technically competent manager and decide on necessary action should it be required to be taken.

Having taken necessary action, the designate person will;

- Undertake a further post-action odour survey, which may be limited to a closer environs to the transfer station, and
- Complete the Odour Incident Follow Up form.

ODOUR DETECTED AT A NON ROUTINE POINT

If odour is detected between routine odour assessment areas, the process of assessing odour will be carried out once a safe location to park or stand has been identified. The outcome of the assessment will be recorded on the Odour Incident & Routine Monitoring Form in the blank spaces provided.

COMPLAINT DERIVED ODOUR ASSESSMENT

Where the assessment is being carried out in response to a specific complaint, the starting point will be the location from which the complaint was made.

SITE INSPECTION

Following an odour assessment, a site inspection should be carried out seeking to trace any observed odour back to source and to evaluate any potential odour-producing activities or locations.

Sniff Test Procedure

In case of any complaint due to odour emissions, an observational method (Sniff Test) and a predictive method (Risk-based assessments using Source- Pathway-Receptor concept) is most suitable.

The assessment should be carried out based on the IAQM Odour Sampling Guidance. IAQM suggests, monitoring using sniff test method can give a measure of odour at specific locations under the conditions prevailing at the times and days of the sampling, but cannot cover all receptor locations under every meteorological condition over a typical year.

The sensory test is carried out at each test location over a standard observation time, typically over 5 minutes. Testing carried out from locations affected by the least-intense odours, to avoid olfactory fatigue. For each test location, the start time of the observation period and the attributes of the odour over the observation period are recorded as follows:

1. *The assessor breathes normally, inhaling ambient air samples through the nose at regular intervals (approximately every 10 seconds, to give 30 samples over typically a 5 minute observation period). However, where the odour levels are either constant or intense then the odour assessor should avoid olfactory fatigue/desensitisation by alternating each sample sniff of ambient air with a sniff of odour-free air from an ori-nasal face mask fitted with carbon filters.*
2. *For each sample, the odour intensity (VDI scale, 0-6) is recorded.*
3. *At the end of the observation period at the test location, the odour unpleasantness is noted down by classifying it as unpleasant, neutral (neither pleasant nor unpleasant) or pleasant. This assumes that at least some of the 30 samples were of intensity 3 or more ("i.e. the odour is at least "barely recognisable").*
4. *The odour descriptor note: Odours can be objectively described using standardised categories and reference vocabulary. It is useful to provide odour assessors with standard descriptor terms, which are organised with similar terms in categories and groups either as a list or as an "odour wheel".*
5. *Next the pervasiveness/extent of the odour at this test location is assessed. This can be calculated as the percentage odour time, tI≥4, which is the number of samples where odour was recognisable divided by the total number of samples (i.e. 30). Note that "recognisable odour" is where the odour strength*

exceeds the recognition threshold and is definitely recognisable by the assessor, i.e. the assessor is capable of definitely identifying its quality/character, which corresponds to VDI[4] intensity of 4 or more.

6. *The average odour intensity, mean, over the test period is calculated and the maximum intensity observed is noted.*

The above procedure is then repeated at the next test location, remembering that the character of an odour mixture can change over distance, as the particular components may become diluted below their individual detection thresholds at different distances.

A record is kept of the meteorological conditions at the time of testing (including wind strength and direction, atmospheric stability category, barometric pressure, rainfall, temperature and humidity), together with information relating to the operations and activities being undertaken on site and in the surrounding area.

The odour intensity scale that is used for this assessment and the matrix to assess the odour exposure (neutral and unpleasant odours) at time and place of sampling is presented in Table A1.

Table A1: Receptor Sensitivity to Odours

Score	Description
0	No odour
1	Very faint odour (possible odour, barely noticeable, need to inhale, whilst standing still and facing the wind)
2	Faint odour (noticeable, need to inhale whilst standing still and facing the wind. Odour is present but cannot be described in precise words or terms)
3	Distinct odour (easily detectable whilst walking and breathing normally)
4	Strong odour (bearable but unpleasant odour, which is easily recognisable)
5	Very strong odour (the character of the odour is unpleasant, but bearable)
6	Extremely strong odour (extremely strong and unpleasant)

The intensity of an odour is a logarithmic function of its concentration. Therefore, increasing the concentration of an odorous chemical or mixture of chemicals by a factor of 10 might increase its perceived intensity by a factor of about 2.

Similarly, if a site causes odour pollution, abatement equipment might need to remove 90% of the odour-causing substances in order to have the intensity of odour as perceived in the community (EA, 2011). These odour scores are used in the sniff tests undertaken at the site.

	Rating				Intensity	Receptor rating	Overall nuisance
Receptor sensitivity	0	0	0	0	0= No odour/ not perceptible	3= high	0 - 2 Very low 3 - 4 Low 5 - 10 Moderate 12 - 14 High 15 - 18 Very high
	1	3	2	1	1= Very weak odour	2= medium	
	2	6	4	2	2= Weak odour	1= low	
	3	9	6	3	3= Distinct odour		
	4	12	8	4	4= Strong odour		
	5	15	10	5	5= Very strong odour		
	6	18	12	6	6= Extremely strong odour		
		3	2	1			
	Odour intensity				Odour intensity x receptor sensitivity = nuisance rating		

Assume all receptor rating is High (3) to represent residential.

[4] *Verein Deutscher Ingenieure (standards)*

ODOUR ASSESSMENT RECORDS

All observations should be noted on the odour assessment report, following the key in order to score for intensity, sensitivity and wind strength (sensitivity may already be specified, wind strength may be taken from weather station). Observations will be reported to a member of the site's technically competent management following the inspection.

Each odour assessment should have a conclusion detailing action that should be taken as a result of the assessment. Guidance on the actions to be taken for identified sources of odour is contained in the Odour Cause and Control Table of the Control of Odours section above.

Completed odour assessment forms will be stored on site for a minimum of two years. The forms will be available for inspection to all relevant persons (i.e. regulatory authority, liaison committee representative) during opening hours.

TRAINING AND CALIBRATION

All designated persons responsible for assessing odour should be trained in the use of this procedure by persons appointed by *FCC Environmental*. Appointed persons will include the Regional Business Manager, Human Resources Training Manager and staff, externally appointed trainers or the Technically Competent Manager for the site.

Training will require the trainee to fully understand this assessment method, responsibilities and to carry out a supervised odour assessment to the satisfaction of the trainer.

A record of the training will be made in the training record sheets kept and available for inspection on site.

RESPONSIBILITIES OF THE DESIGNATED PERSON

The designated person carrying out an odour assessment has the responsibility to ensure that the precautions listed below are followed to their best ability.

- Not to smoke or consume strongly flavoured food or drink, including coffee, for at least half an hour before the assessment is carried out.
- Not to consume confectionery or soft drinks immediately before and during the assessment.
- Not to apply scented toiletries, such as perfume/aftershave immediately before or during the assessment.
- Ensure the assessment is carried out by another designated person if you have a cold, sore throat, sinus trouble etc. that will impair your ability to detect odours.

Appendix B
Odour Incident & Routine Monitoring Form & Odour Incident Follow Up Form

Odour incident & Routine Monitoring Form
WATERDALE

Refer to overleaf (or next page) for keys

Assessment Information:

Name		**Date**	
Start Time		**Finish Time**	

Complaint or Report Information:

Complaint or Report?		**Date**	
Location		**Details**	

Weather:

General Weather		**Wind Strength ***	
Temperature (°c)		**Wind Direction**	

Assessment Results:

Location	Intensity *	Sensitivity *	Odour description	Other activities?	Is Odour attributable to site?

Location	Intensity *	Sensitivity *	Odour description	Other activities?	Is Odour attributable to site?

Notes:

Intensity:

No.	Definition	DESCRIPTION
1	No detectable odour	None.
2	Faint odour	barely detectable, need to stand still and inhale facing into the wind
3	Moderate odour	odour easily detected while walking and breathing normally, possibly offensive
4	Strong odour	bearable, but offensive odour - will my clothes/hair smell?
5	Very strong odour	this is when you really wish you were somewhere else

Sensitivity:

No.	Definition	Description
1	Remote	no housing, commercial/industrial premises or public area within 500 m
2	Low sensitivity	no housing, etc. within 100 m
3	Moderate sensitivity	housing, etc. within 100 m
4	High sensitivity	housing, etc. in the immediate vicinity
5	Extra sensitive	High sensitivity and complaints arising from residents within immediate vicinity

Wind Speed – Beaufort Wind Scale

Force	Description	Observation	Km/hr
0	Calm	Smoke rises vertically	< 1
1	Light air	Direction of wind shown by smoke drift, but not wind vanes	1 - 5
2	Light breeze	Wind felt on face; leaves rustle, ordinary vane moved by wind	6 - 11
3	Gentle breeze	Leaves and small twigs in constant motion	12 - 19
4	Moderate breeze	Raises dust and loose paper; small branches are moved	20 - 29
5	Fresh breeze	Small trees in leaf begin to sway, small branches are moved	30 - 39
6	Strong breeze	Large branches in motion; umbrellas used with difficulty	40 - 50
7	Near gale	Whole trees in motion; inconvenience felt when walking against wind	51 - 61
8	Gale	Twigs break off trees; progress generally impeded	62 - 74
9	Strong gale	Slight structural damage occurs (chimney pots and slates removed)	75 - 87
10	Storm	Trees uprooted; considerable structural damage occurs	88 - 101

Odour Incident Follow Up Form

Odour Incident Follow Up Form
Source identified / verified
Actions taken
Results of actions taken
Results of post action monitoring

Originator and detector of complaint informed of outcome? Include date & time.
Completed by. Include date & time.

Appendix C

Location Plan 794-NI-RWM-IBR1405-0001-01 & Receptor Plan 794-NI-RWM-IBR1405-0002-01

Appendix D

IBR1349-102A Permit Variation Boundary Change

Appendix E

Waste Types and EWC codes