SLOUGH MULTIFUEL EXTENSION PROJECT

Planning Inspectorate Ref: EN010129

The Slough Multifuel Extension Order

Land at 342 Edinburgh Avenue, Slough Trading Estate, Slough

Document Ref: 7.7.8 Condition 13 – Odour Management Plan

The Planning Act 2008

Applicant: SSE Slough Multifuel Limited

May 2023 – Deadline 5

Slough Multifuel

Document Ref No: 13.1

SBC Ref: P/008987/024

The Town and Country Planning Act 1990 (as amended)

Submission of Details to Discharge Condition 13 - Odour Management Plan

Slough Multifuel, Land at Edinburgh Avenue, Slough Trading Estate, SL1 4TU

Applicant: SSE

Date: November 2019

Document Number	13.1		
Revision	1.2		
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Document Owner	DWD		

Glossary

Abbreviation	**Long Term**
BAT	Best Available Techniques
CHP	Combined Heat and Power
EfW	Energy from Waste
ES	Environmental Statement
FGT	Flue Gas Treatment
HGV	Heavy Goods Vehicle
HZI	Hitachi Zosen Inova
MSW	Municipal Solid Waste
RDF	Refuse Derived Fuel
SBC	Slough Borough Council
SMFEL	Slough Multifuel Energy Limited

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1.0 INTRODUCTION

1.1 On 2 June 2017 Slough Borough Council ('SBC' or 'the Council') granted full planning permission under the Town and County Planning Act (1990) ('the Act') for two applications (P/00987/024 and P/00987/025) associated with the construction and operation of a new multifuel combined heat and power ('CHP') plant on the site of an existing power station on land at Edinburgh Avenue, at the Slough Trading Estate, SL1 4TU (known as 'Slough Multifuel').

1.2 Planning permission Ref. P/00987/024 is for the demolition of redundant plant and buildings and development of a multifuel CHP plant of up to 50 megawatts, including an enclosed tipping hall; fuel storage bunker and blending facility; boiler house with combustion; grate/s, boilers and auxiliary equipment; flue gas treatment ('FGT') plant/s; turbine hall with condensing steam turbine; ash and residue handling facilities; erection of a new south chimney stack (up to 90 metres height) or extension of existing south chimney stack (up to 85 metres height); plant, associated development and alterations to site access. The permission was granted following completion of a Section 106 Agreement.

1.3 Permission was also granted by SBC on 2 June 2017 (Ref. P/00987/025) for the demolition of an existing fuel store and construction of a central site services building (containing staff facilities, stores/workshops and plant), installation of water treatment plant, provision of replacement car parking, and associated works.

1.4 The planning permissions are subject to a number of conditions, which are set out on the decision notices. The planning conditions are intended to secure the following:

- the approval of certain details of the development prior to the commencement of development;
- the approval of certain details prior to the commissioning of the development;
- the approval of certain details prior to the development being brought into commercial use;
- that the works comprised within the development are carried out in accordance with the details approved under the conditions; and
- the manner in which the development is constructed, operated and decommissioned.

1.5 The applications (and accompanying details) to secure the necessary approvals under the planning conditions (i.e. to secure the discharge of the conditions) must be submitted to SBC as the 'planning authority' for the area in which the development is situated.

1.6 This document forms part of the application submitted to SBC to discharge Condition 13 – Odour Management Plan and provides the required details and information.

2.0 CONDITION 13 – ODOUR MANAGEMENT PLAN

2.1 Condition 13, regarding the submission of an Odour Management Plan, states that:

(13) *"Prior to commencement of development, details of the odour management plan, such as a ventilation or odour filtration system for the bunker and tipping hall area, shall be submitted to, and approved in writing by the Local Planning Authority. Thereafter, the approved details shall be maintained, operated and retained throughout the operational life of the development."*

3.0 BACKGROUND

References to Odour Emissions and Management in the ES

3.1 An Environmental Statement ('ES') was prepared in 2014 to support the planning applications. Relevant information related to odour management previously referenced as part of the application are reproduced below:

ES Paragraph 8.3.36 – 8.3.48 (Odour Emissions)

Assessment of Odours from the Operational Power Plant

3.2 During routine operation, the waste storage bunker and reception/tipping hall operate at slight negative pressure. During the combustion process, air from the bunker and reception/tipping hall is drawn into the furnace. This ensures that the bunker/hall remain at a negative pressure and minimises the potential for odorous air to escape fugitively from these areas. It is therefore not foreseen that odorous emission will result from the storage and handling of fuel during normal operation

3.3 An individual process line is expected to be operational for around 90% of the year, during which time the air from the refuse derived fuel ('RDF' or 'fuel') storage and handling areas will be directed through the combustion system in this way. A twin line plant would be managed with the intention that at least one line was always operational and therefore would be unlikely to need further odour controls. Selection of a single line or twin line design may therefore affect the need for additional odour controls.

3.4 In any event, when maintenance activities are planned, the potential for odours to occur will be minimised by managing fuel storage levels and reducing deliveries, in order to empty the storage areas prior to planned plant shutdowns, minimising the potential for odour generation.

3.5 During planned or unplanned maintenance activities, when the combustion plant is not operational, an alternative method of odour control may be required. Various alternatives have been considered as part of a BAT assessment for the control of odour from the installation. The final decision on whether any additional controls are required – and what form they will take – will be made as part of the application to the Environment Agency ('EA') for an Environmental Permit for the operation of the development. Preliminary findings indicate that if additional secondary abatement is required in the fuel storage bunker and potentially the tipping hall, carbon filter abatement plant may represent BAT for the development. However, it is recognised that there are alternative technologies that could be used to adequately mitigate any odour and the final choice of technology (if required) would be agreed through a BAT justification in liaison with the EA, as part of the Environmental Permit application.

3.6 The following section presents the Odour Management Scheme as required by Condition 13 of Permission Ref. P/00987/024.

4.0 SCHEME TO DEAL WITH ODOUR MANAGEMENT

4.1 The Slough Multifuel plant is designed to combust refuse derived fuel ('RDF'), biomass and woodchip. The plant will produce electricity as well as having a facility to provide process steam and heat to other installations.

Fuel

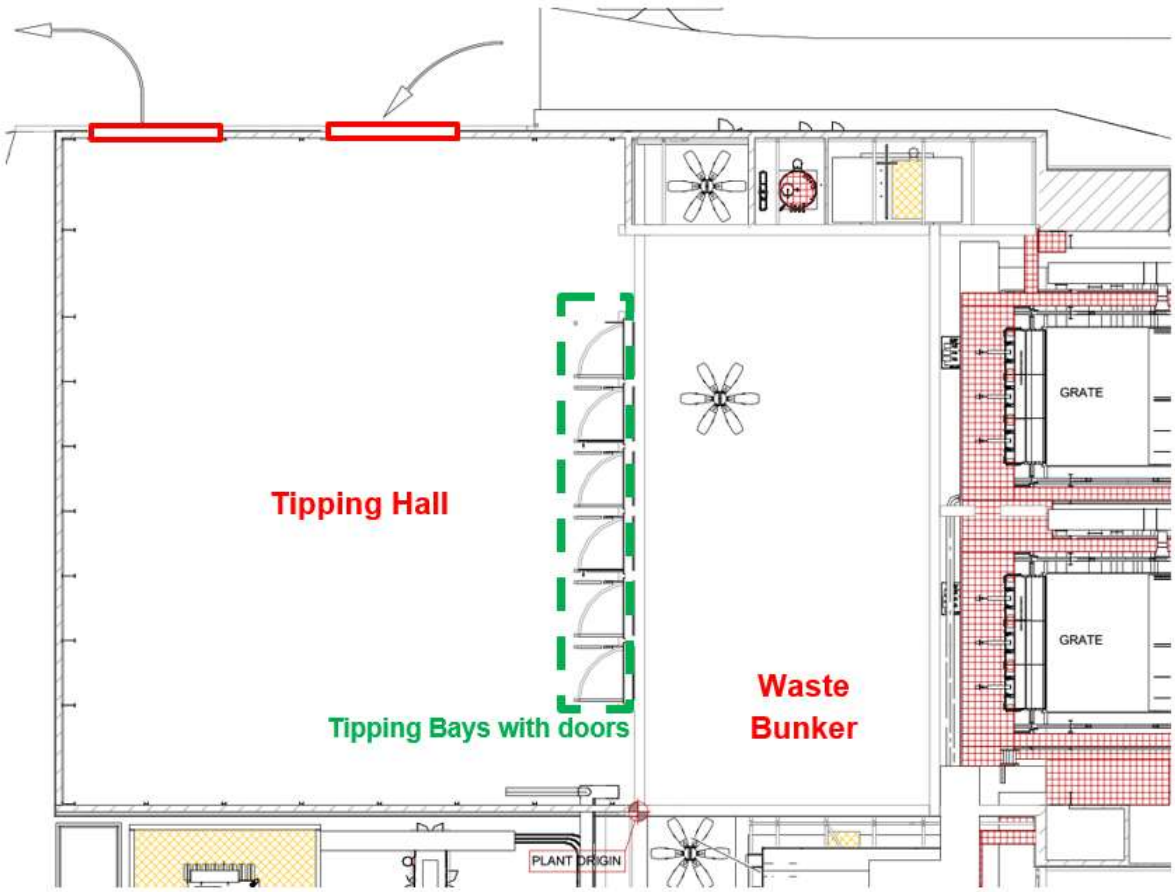
4.2 The Slough Multifuel plant will mainly burn RDF but may also burn biomass and woodchip.

4.3 The process of generating RDF removes or significantly reduces the compounds that produce odour in municipal waste. This means that odour from the plant is already expected to be much lower than conventional energy from waste ('EfW') plants or incineration plants.

Fuel Deliveries

4.4 Drawing 1, below, shows the layout of the tipping hall, fuel bunker and grate.

Drawing 1 – the tipping hall, waste bunker and grate.



4.5 Waste will be delivered to the site by road using enclosed HGVs.

4.6 As seen on the **Drawing 1**, the tipping hall is equipped with doors for entry and exit purposes.

4.7 Tipping Hall doors will comprise a solid structure that is normally closed and only activated to open/close with a loop in the ground and/or manually from the local control panel within the Tipping Hall.

4.8 These doors are designed as fast acting roller shutter doors which open and close in a few seconds.

5.0 ODOUR CONTROL SCHEME

5.1 There are two cases for odour control: when the plant is in operation; when the plant is fully shut down. These two cases are described below.

Plant in Operation

5.2 When the plant is in operation odour control is achieved by drawing air, required for combustion, from the waste bunker and tipping hall. This system provides a slight negative pressure ensuring that odours cannot escape from the plant.

5.3 Air enters the plant via two main routes during operation:

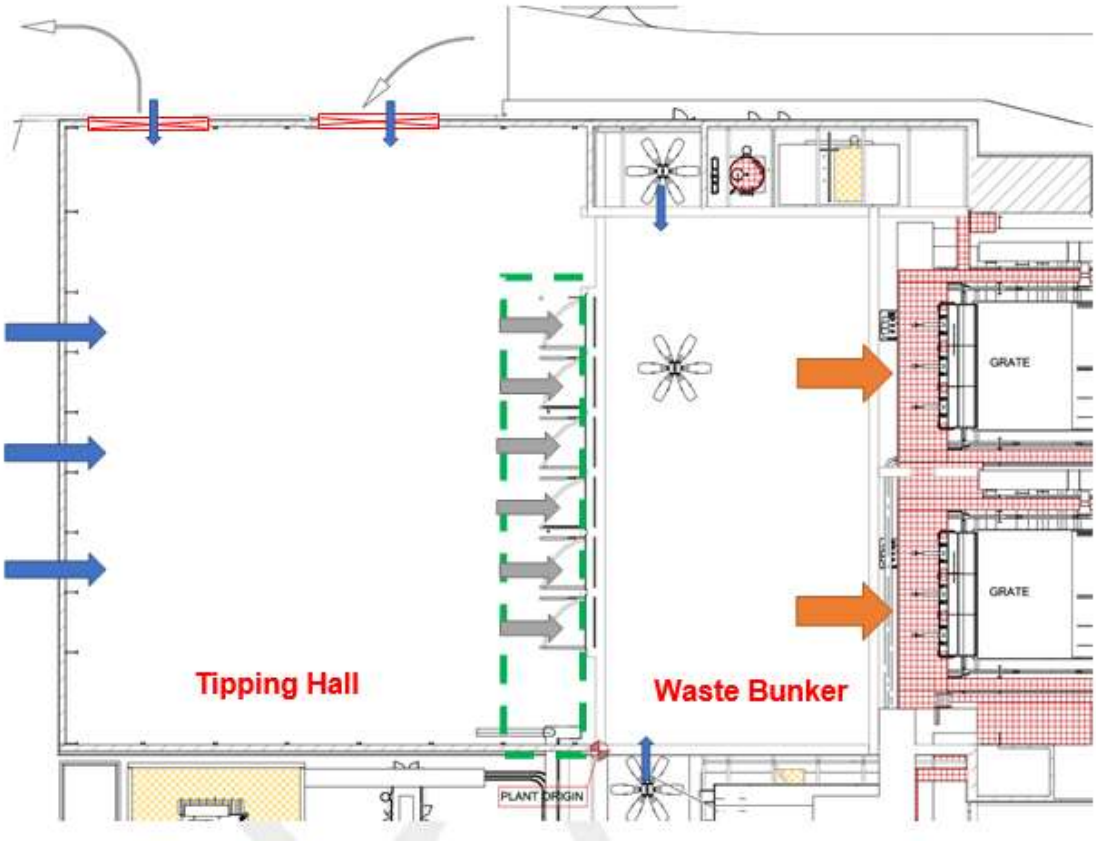
1. the doors to the plant are shut and the main air is drawn in via louvres at the back of the tipping hall (drawing 2) (overleaf); and
2. the doors to the plant are open (during lorry movements) and the main air is drawn in via the open doors (drawing 3) (Page 10).

5.4 In addition to the main routes there may also be a small negligible volume of leakage air via all the building elements (except the floor) and via access hatches and hoppers.

5.5 Access to the waste bunker from the tipping hall is via the tipping bays. Each bay has its own door. The bay doors are usually closed except when deliveries are taking place. When the doors are opened air from the tipping hall can easily flow to the waste bunker. When the doors are closed vents above the door allow a constant flow of air into the waste bunker.

5.6 In the final stage air is drawn from the waste bunker by the primary air fan of each line. This ensures that where the odour is strongest the negative pressure is also at its strongest.

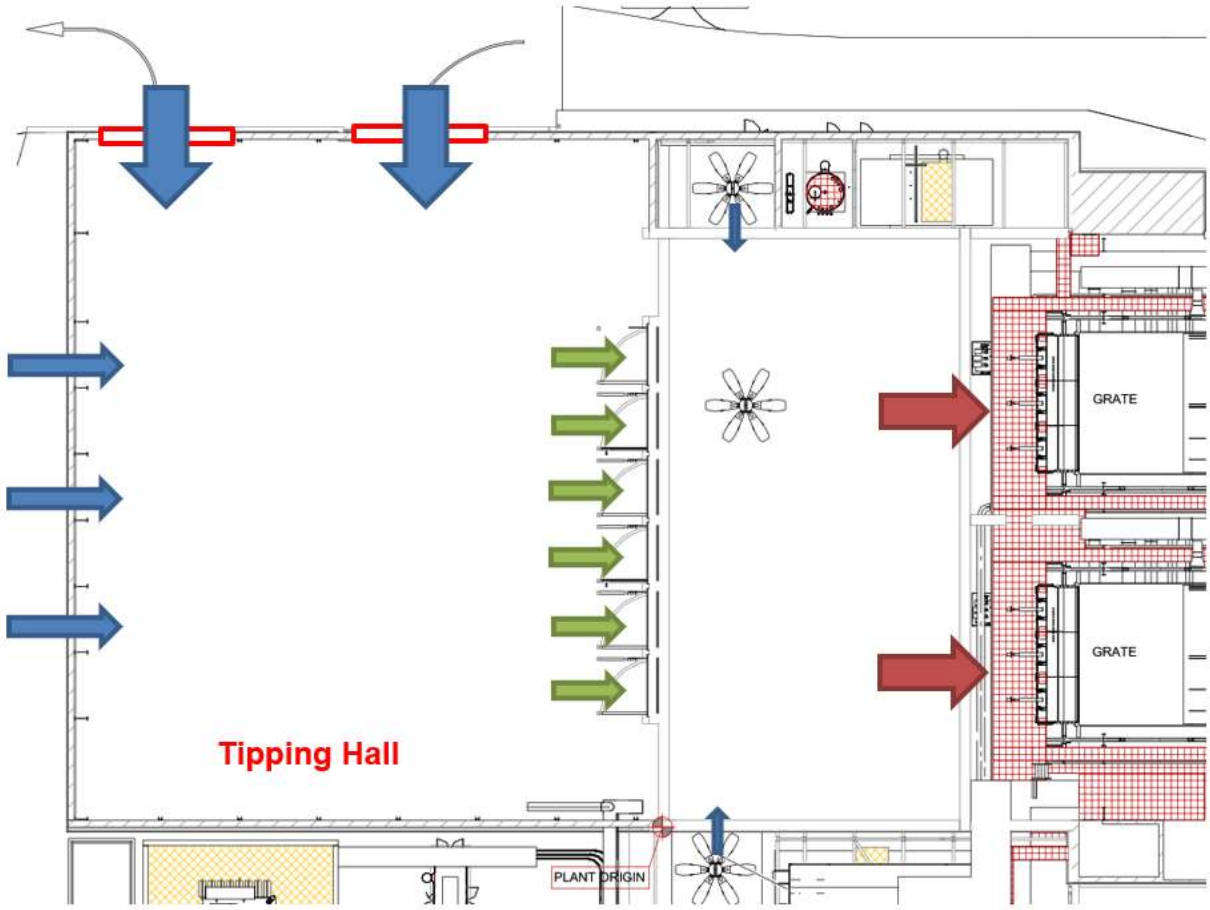
Air Flow via Louvres



Drawing 2 – the primary air flows during operation with the doors closed. The dimensions of the arrows give an indication of the volume (small, medium or large) of air at each point.

5.7 The blue arrows in **Drawing 2** indicate fresh air being drawn in from outside the plant. The large blue arrows denote the Louvres, the small blue arrows the ingress of air via hoppers, doors and openings. The green arrows show air being drawn into the waste bunker via dedicated vents or via open tipping bay doors. The red arrows show the air extracted from the waste bunker being fed into the furnace (primary air).

Air Flow via Open Doors



Drawing 3 – the primary air flows during operation with the doors open. The dimensions of the arrows give an indication of the volume (small, medium or large) of air at each point

5.8 As illustrated on **Drawing 2**, the blue arrows in **Drawing 3** indicate fresh air being drawn in from outside the plant. The large blue arrows denote the flow via the doors, the small blue arrows the leakage air via the louvres, hoppers, doors and openings. The green arrows show air being drawn into the waste bunker via dedicated vents or via open tipping bay doors. The red arrows show the air extracted from the waste bunker being fed into the furnace (primary air).

5.9 It should be noted that the louvres can be shut during plant outages.

Building Negative Pressure

5.10 The volume of air drawn in by the furnace is expected to be sufficient to prevent odour escaping. The concept is widely used in EfW plants. However, to give an indication of the expected negative pressure, calculations by the louvre manufacturer during the detailed design shall be used to estimate the likely negative pressures in the tipping hall and waste bunker.

5.11 The negative pressure calculations shall include air flow via the louvres, via the tipping hall doors and also small contributions from the leakage elements through the building. This will give a range of air pressures under various operating cases for the plant i.e. for minimum, normal and maximum operation when both one and two lines are in operation.

5.12 A negative pressure in the tipping hall should ensure that odour is contained during operation.

5.13 It is likely that the negative pressure values in the waste bunker (the main source of odour) will be higher than tipping hall.

5.14 This means that during one-line operation, or minimum stable operation for two lines, the time the main entry/exit doors are open during operation should be minimised.

5.15 However, if it is necessary to frequently open the tipping hall doors for any reason, the odour control systems detailed in the Abnormal Operations section can be used to ensure the plant does not give rise to unacceptable odours at the installation boundary.

Abnormal Operations / Plant Shut Down / No Combustion

5.16 For planned off-line periods both the volume of stored fuel and the number of deliveries requiring access to the tipping hall should be reduced as far as reasonably practicable.

5.17 In this way, the source of odour is minimised and the building is kept closed for as long as possible, to minimise the flow of air through the combustion system. However, when the power plant is shut down it is recognised that there will typically be some fuel stored in the fuel bunker and there may also continue to be deliveries of fuel during the period.

5.18 However, the power plant will be designed such that, should the need arise, additional odour control techniques could be retrofitted to further control odour releases from the fuel bunker and/or the tipping hall, using, for example, carbon filters. Provision is therefore made for the future installation of an odour abatement system such as an activated carbon filter see **Drawing 5** (overleaf).

5.19 The main potential egress route for odorous air to leave the process buildings will be via the tipping hall and in particular via the delivery doors if they have to be opened.

5.20 As a further control measure, for occasional short-term use to prevent odour emanating from the building, a deodorising spray system will be installed in the tipping hall, as shown in **Drawing 6A** (Page 13).

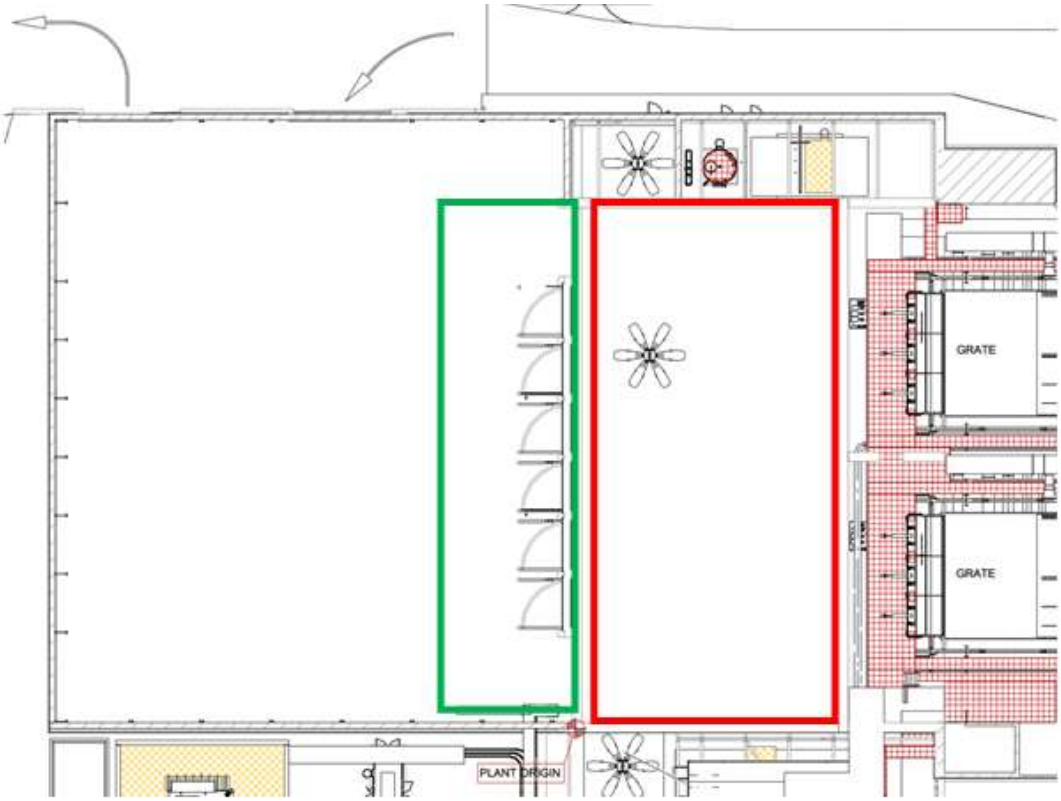
5.21 There is a second system used for the suppression of dust in the fuel bunker that could also be modified to act as an odour control system, should the need arise. This is also shown in **Drawing 6B** (Page 13).

5.22 During the periods when the plant is shut down there would typically be waste stored in the bunker and there may also be deliveries of waste during the period.

5.23 As can be seen from Drawing 2 the main route for odour to leave the buildings will be via the tipping hall. NB the louvres will be closed during a plant outage however they will not be air tight and vehicle movements will cause the main doors to open periodically.

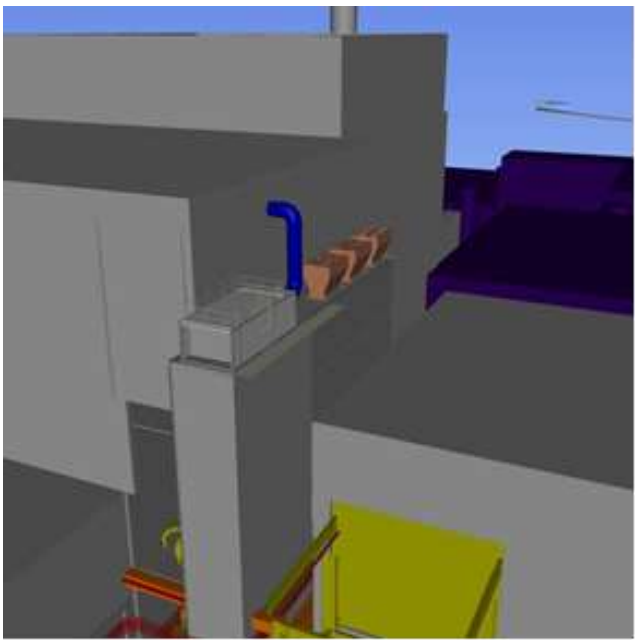
5.24 To prevent this odour leaving the building a deodorising spray system will be installed in the tipping hall. This is shown in **Drawing 4** (overleaf).

Drawing 4 – The areas covered by the deodorising systems



The area covered by the dust suppression system in the tipping hall is shown in green and in the waste bunker, which can be converted to a deodorising system, is shown in red.

Drawing 5



Drawing – 5 shows the provisional location of a future activated carbon filter.

5.25 In the event some odours deemed to be causing a nuisance to the environment, an activated carbon filter is an additional method to the deodorising spray: this system which comprises a prefilter, activated carbon filter, a fan and a discharge. (Note: This is in a different location to that assessed in the original EIA but is at a higher point above ground level)

5.26 This alternative method can be operated during a complete plant shutdown when both incineration lines are out of operation, in other words when there is no suction air and no negative pressure.

5.27 In such cases to avoid any leakage air from the waste bunker and tipping hall, this system can be put in operation by extracting air from the waste bunker through a carbon filtration system before it is released to the environment. If needed, such a system can be added to the plant after the facility has started its operation and operating experience is available.

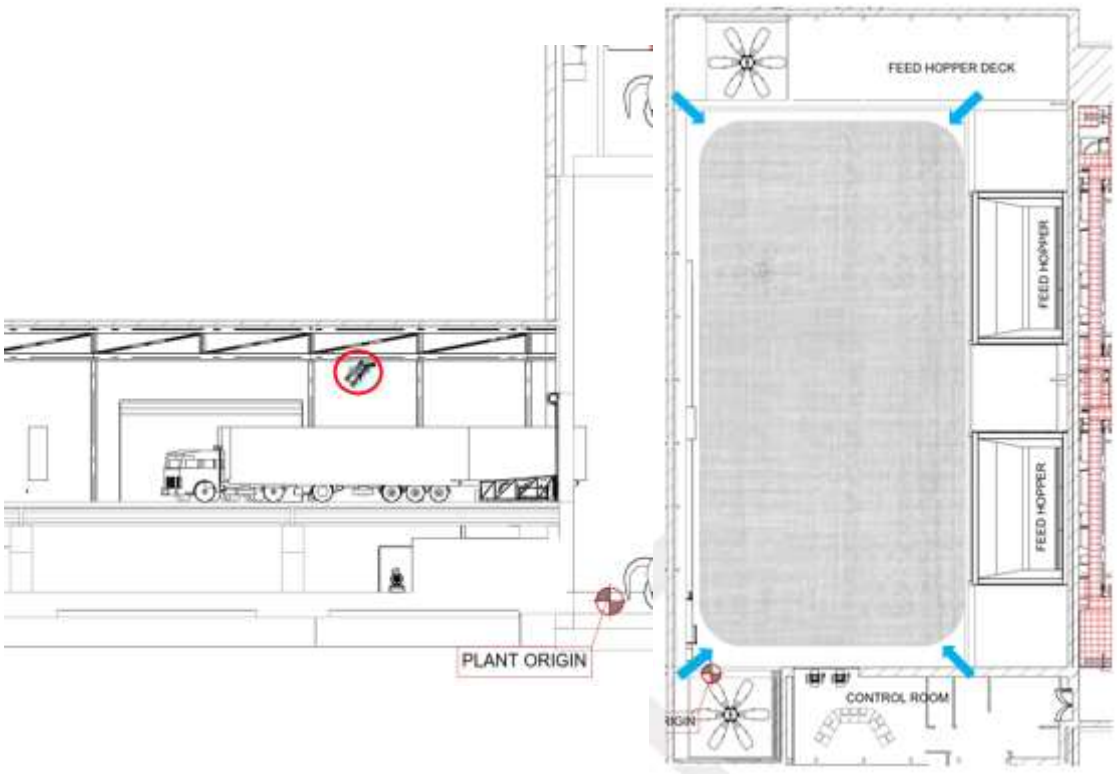
Expected Coverage of the Systems

5.28 Drawings 6A and 6B are extracted from the functional specification for the proposed deodorising system. The system is likely to be a mist-air system. This is a system that is widely used in this type of application and has been used at the Slough Power Station site in the past.

5.29 The system creates a very fine fog distributed by fans located to create a constant uniform baffle of air and fog to keep odour and dust subdued. An odour masking additive can also be added to the fogging system.

5.30 This deodorising system will be similar to systems fitted in conventional EfW plants. In these plants, which are typically far more odorous than the plant under construction at Slough, the deodorising systems have been shown to be effective for odour control.

Drawings - 6A (left) and 6B (right)



6A shows the typical concept for coverage in the tipping hall. The fans and mist will be positioned to cover the tipping bays.

6B shows the expected mist pattern in the waste bunker.

Summary

5.31 The Slough Multifuel plant is designed to minimise odour emissions to the environment. This document has been written to explain what features are included in this design and how the design will meet the requirements of Condition 13.

5.32 As the multifuel plant will mainly burn RDF odour emissions are already expected to be lower compared to black bag waste by virtue of the waste pre-treatment. However, should the waste supply change over time the plant is still designed to minimise odour emissions.

5.33 During normal plant operation odour will be controlled primarily by inspection of fuel arriving at the site, use of enclosed vehicles and tipping of fuel into the bunker, and drawing air from the tipping hall through the boilers for combustion to create a slight negative pressure.

5.34 During a shut down, waste fuel stocks will be managed to minimise stored volumes where possible, and doors will be kept closed to minimise fugitive emissions. As a further control measure to minimise off-site odour, a deodorising spray system will be fitted in the tipping hall.

5.35 The odour control system will be designed such that additional measures can be retrofitted if the need arises. A provision is made for a future installed Activated Carbon Filter as shown in Drawing 5.

5.36 In order to monitor the effectiveness of the system, the operator will instigate a regime of periodic monitoring around the site perimeter, which will be maintained through the lifetime of the power plant and recorded in the form of an odour diary.