

Greencore Prepared Meals Warrington

Odour Management Plan

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Hazlewood Chilled Meals Warrington

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Trading as Greencore Chilled Meals
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Permit number

BO2226IU

Version	Date	Change
1	30.06.11	First issue
2	26.07.16	Oven installation / Removal variation update
3	30.11.19	Carbon odour abatement unit install
4	20.12.23	Effluent Treatment Plant installation

Table of Contents

- 1.0 Introduction
 - 1.1 Objectives
 - 1.2 Responsibilities
- 2.0 Sources, Releases and Impacts
 - 2.1 Site History
- 3.0 Sources of Odour
 - 3.1 Sources of Odour – Production Process
 - 3.2 Release Points
 - 3.3 Impacts
 - 3.3.1 Pathways
 - 3.3.2 Receptors
 - 3.4 Assessment
 - 3.5 Control Measures
 - 3.6 Post Assessment
 - 3.7 Monitoring
- 4.0 Sources of Odour – Effluent Treatment Plant
 - 4.1 Release Points
 - 4.2 Impacts
 - 4.2.1 Pathways
 - 4.2.2 Receptors
 - 4.3 Control Measures
 - 4.4 Post Assessment
 - 4.5 Monitoring
- 5.0 Contingency
 - 5.1 Complaints
 - 5.2 Engaging with Neighbours
- 6.0 Emergency Conditions
- 7.0 Review

1.0 Introduction

This Odour Management Plan (hereafter OMP) has been prepared to comply with the requirement of Section 1.4.1 – Improvement Programme of the Pollution Prevention and Control permit number BO2226IU.

The OMP has been produced with reference to the Environment Agency (EA) guidance on OMP's and the Guidance note EPR H4 Odour Management (Draft).

Section 1.4.1 was amended on the 17th February 2011 following a variation of the site permit.

The variation to the permit followed the introduction of odour abatement to part of the sites activities.

1.1 Objectives

The objectives of this OMP make reference to the EA guidance and considers;

- Source, release and impacts
- Controls – physical and management controls
- Monitoring – of physical controls, operational, management and emergency controls.
- Contingencies – responsibilities and actions to be taken in the of odour issues being identified
- Emergency plans

The objective of the OMP, considering the above points, is to ensure the sites activities comply with the requirements of the conditions set out in the PPC permit and that odour generating activities present minimal nuisance to local residential areas.

1.2 Responsibilities

The Site General Factory Manager will have ultimate responsibility for ensuring that nuisances and hazards arising from the facility due to odour are minimised in accordance with the requirements of the PPC permit.

Day to day activities in ensuring compliance will be delegated to an appropriate level within the business. Which will include a daily documented check of any control measures
As part of the operational function of the business daily meetings will discuss any issues raised, planned operational process changes or any other work which may lead to non compliance with the permit requirements.

Responsibilities will be delegated through the Engineering, SHE, Financial and Operational functions of the business. External expertise will be used following careful selection.

2.0 Sources, Releases and Impacts

2.1 History

There have been no changes in operation to the business or processes since the permit was first issued, however a number of complaints have been received from local residents relating to a cooking odour from the site. The majority of complaints have related to a 'garlic / onion' smell.

Approximately 50% of the sauces cooked have onions / garlic puree heated as the first stage of the process, when the lid is raised to add the next ingredient a release of pungent steam is released to atmosphere via the extraction.

The site produces in excess of 1,200,000 ready meals per week and an overall capacity to produce 1.5 million meals per week. Mainly Pasta and sauce based products they are manufactured and assembled on site from raw ingredients.

The site is located on an industrial estate adjacent to a housing estate on its northern boundary. Complaints received from residents on the housing estate relating to onion / garlic type odours have led to investigation into odour abatement technology on the sauce cooking extraction systems.

As a result of these complaints and an enforcement notice issued by the Environment Agency in July 2010 a chemical abatement unit was installed to treat air extracted direct off the cooking pans. The levels of complaints reduced post installation but have recently increased.

Further odour measurements have been completed recently (October 2015) and found the abatement equipment is not performing well and an assessment found that due to the room extraction having no treatment apart from neutralizer the risk of release from the room extract was a potential source of the complaints.

A new approach was taken in 2019 to replace the abatement unit with a much larger piece to deal with all the air from the cooking pans and the room as part of a major refurbishment project of the facility.

The sources of the odour, pathways and the receptors are unchanged from the assessment but combining the airflows, filtering through carbon and increasing the stack emission point.

2024 – As part of the site ongoing commitment to reduce impact on the environment and following the Reg 61 review an effluent treatment plant has been installed. This involves effluent from the site being processed via solids screen, balancing tank, Dissolved Air Flotation (DAF) and sludge storage and removal. It is included in the OMP as a potential source of odour from a new site activity.

3.0 Sources of Odour

There are two sources of odour generating activities from the site

- Production Process
- Effluent Treatment Plant

These will be covered separately within this document,

3.1 Sources of Odour - Production process

The source of the odour complaints received has been identified as being air extracted from the sauce cooking room. During the sauce cooking process, when the pan lid is raised to add the next ingredient steam contaminated with odour is released into the room and immediately extracted via the extraction canopy.

It is only during the cooking process that it was identified as odour being emitted from the site and causing nuisance to the local residents.

There are two ovens used for baking and steaming, odour is released during the process from the oven chambers.

There are other emission points from site which are from cooking activities of pasta and ovens and from areas where cleaning is carried out. None of these have been identified as causing nuisance.

3.2 Release Points

There are five release points from the cooking area

Room Extraction

The air extracted from the room is extracted from points 34, 35, 36 & 39 on drawing reference 54762003 into a duct work system this then combines with the oven chamber extracts and the ductwork runs across the roof to a Carbon Abatement system (Point 52). This is located on the roof of the Ammonia plant room. The stack height of the release point is 20m above ground level and tapered to accelerate the released air velocity. these stacks are joined together and raised to a height of 15m before being emitted through point 51 at a rate of approximately 15m/s. This air is low concentration but high volume

3.3 Impacts

3.3.1 Pathways

The release point of the contaminated air is at a height of 20m. This was advised following the Odournet surveys who carried out modelling and helped in the design criteria of the system. The air is split into two streams through separate carbon beds containing c 20T of activated carbon, before being combined back together and released.

The wind speed and direction data was provided under the initial odour assessment by 'Odournet Limited'. Data provided shows that the predominant wind direction is from the south, blowing towards the housing estate on the North side of the facility. It is noted that there is no change between the initial assessment and the more recent one in 2015.

Figure 4 - 2005-2007 windrose for Manchester Airport

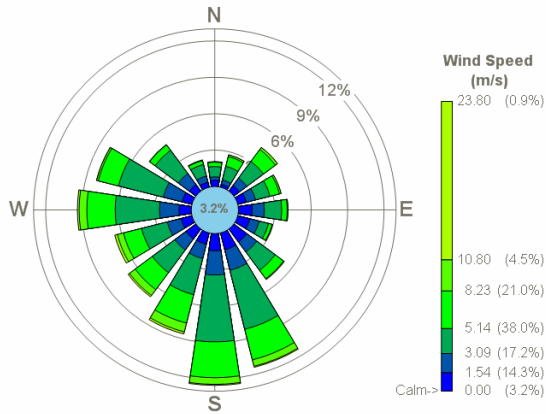
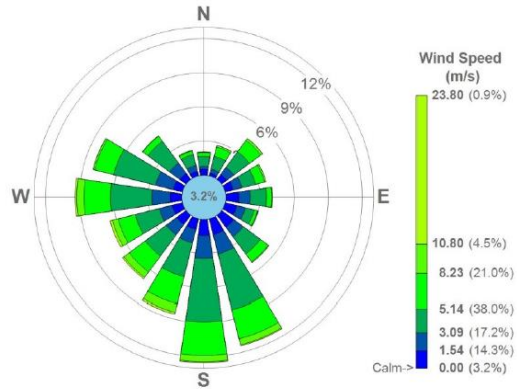


Figure 2: Windrose for Manchester airport for 2010-2014



3.3.2 Receptors

Complaints have been received to site directly or via the Environment Agency. The majority of these were from the northern side of the site where the majority of the housing and residential area is located.

The image below (Taken from the 'Odournet report' shows the proximity of the housing estate to the site boundary.

Odournet identified that under current operational conditions the meteorological conditions the residential area would be affected the most and the site would present a nuisance to these residents based on the levels of odour measured during the assessment.



3.4 Assessments

In November 2009 Odournet UK Limited carried out an initial assessment.

They were re-engaged by the business in October 2015 and were commissioned by the site to

- Carry out an odour monitoring survey
- An impact assessment of the odour in terms of 'reasonable cause for annoyance'
- Suggest possible treatments to reduce odour to a minimum and identify the Best Available Technique (BAT) for the site.

In the report findings (Report ref GRCO15A_11 Final November 2015) the executive summary concluded that

- The existing abatement unit was reaching the end of its operational life
- The site odour emissions did present an annoyance to residents,

"....Dispersion modelling indicates that the odour exposure levels that are currently predicted to occur around the site are likely to pose a risk of adverse odour impact at nearby sensitive receptors, based upon odour impact criteria outlined by the Environment Agency. In order to reduce the risk of impact and odour complaints in the future, enhancement of the existing odour control strategy is clearly required."

It should be noted that the assessments were carried out under absolute worst case scenarios so as to get as much odour released at the time of measurement. The measurements were taken during a period when the cooking was staged so 3 x meat sauces were started at once, vessel lids were left open while ingredients were added.

As a result of this from the abatement unit 26,942 OU3/s were measured post treatment and 60,465 OU3/s from the room extraction

The report concluded 3 options should be considered.

1. Replace the existing abatement unit with one that would reduce emissions below 5000ouE/M3 however odour levels would likely remain above the level in which annoyance would be caused.
2. Replace existing abatement unit and release this and the existing room extract through a 25m high stack.
3. Combine the two airstreams from the vessels and the room and treat through an adsorption abatement system and release through a 17m high stack.

Due to the nature of the air extracted it is generally of high temperature up to 40°C and c70% humidity which creates problems when used in a carbon based adsorption system. This results in a steady decline of performance and it is difficult to assess when the system is operating correctly or it has fallen behind. The only measure of this performance is relying on odour complaints. Our preferred method of treatment and one that has proven to work in the past is through chemical scrubbing.

So our proposed solution is to combine the two air streams of room and vessel and pass them through a large chemical scrubber and release them through a 17m high stack.

3.5 Control Measures

A number of options were considered including replacement of the chemical abatement system, combined chemical and carbon systems and a standalone carbon abatement.

A significant project in 2018/19 with extensive structural additions and renovations permitted the installation of a twin tower 4 bed carbon abatement system containing c20T of activated carbon capable of dealing with 125% of the total air flow (extra 25% for future capacity).

Treating all the air from the cooking process. The pan extraction system was removed and all air from the room ducts is confined in the duct through the abatement system. There is no extract from the cooking area that is released and does not go through the abatement equipment.

The unit has been specified to deal with an incoming 10,000ouE/m³. Odournets report suggests that the incoming air is likely to be around 5,000ouE/m³.

Combining the air streams from the room will iron out the huge peaks and troughs we saw in relation to odour loading, therefore the performance of the unit will be more consistent. The 25% additional capacity will allow us to connect in other emission points if required such as future site development. The 20m high stack will improve dispersion of the air once it leaves the stack.

The drawings attached to this document show the technical elements of the odour abatement.

3.6 Post Assessment

Following the installation and commissioning of the odour abatement solution further odour surveys will be commissioned. The company used to carry out the assessment will be by a recognized and UKAS accredited company.

3.7 Monitoring

To ensure the effective and continuous operation of the odour control systems regular inspection and monitoring will take place.

- Daily operational checks, condition of ductwork, fans, carbon beds, it is running etc
- Daily pressure differentials of the four beds. These are located on the sides of the vessel. As pictured.



- Daily control panel status checks
- Weekly drain of carbon bed condensations as required
- Monthly checks of the belts and fan assembly

- 6 monthly inspection and test of Carbon – This may be extended once a history of operation is established. Following initial startup of the plant and a guarantee of 18 months an initial 12 month check was found to be too long.
- Odour assessment from the odour abatement system. This will be carried out by a recognized and UKAS accredited company.
 - To measure the inlet and outlet concentrations.
 - Air Temperatures at inlet and outlet
 - Duct flow rates at inlet and outlet

4.0 Sources of Odour – Effluent Treatment Plant

Initial assessment through the design phase of the ETP has identified potential sources of odour from the process of either transferring or storing the components of the effluent. These initial assessments and acquired knowledge from experiences of the project team have been used to determine control measures at the design stage to minimize the impact. The capacity of the ETP is designed to cope with the entire possible capacity of the site Effluent Consent to Discharge of 1500m³ per day.

4.1 Release points

There are four release points from the ETP.

With reference to drawing 54762003

- Point 76 is a vent on the Balance tank,
- Point 77 & 78 are vents on the sludge tanks,
- Point 79 are Chemical storage tanks,

There are potential parts of the plant which may lead to odour but these are addressed in the control measures section of this document. DAF Operation, Sludge Offloading and Screen solids storage.

4.2 Impacts

4.2.1 Pathways

Potential release from the points detailed below are at high level. Point 76 is over 7m above ground and 77/78 are over 4m above ground.

4.2.2 Receptors

The ETP is located at the furthest location away from the resident estates as identified in 3.3.2 above. It is unlikely that the plant will cause nuisance to these residents. The site is not located on a frequent pedestrian traffic route so nuisance to receptors is deemed minimal and will be assessed post installation and throughout the operation of the plant.

4.3 Control Measures

Considerable time and effort has been put into the design and HAZOP stages to address all potential sources of odour and put in control measures for each part of the plant.

Process	Control Measure
Pre balance tank solids screening	Collated in small bins and removed regularly to existing covered food waste trailer.
Balance Tank	Sealed lid over main tank with small vent (EP 76). Tank bunded with level detection and alarms in tanks and bund, no penetrations through bund wall.
DAF unit / sludge removal	Lid over the main DAF vessel
Sludge Tanks	Sealed lid over sludge tanks with small vent on each, connecting pipework to balance between, High level alarms, tanks bunded
Chemical Storage and Dosing	Bunded tanks for required chemicals, locked connections for deliveries, supervised deliveries, Twin walled pipework with leak detection from tanks, to dosing and point of injection into the process
Sludge removal	Competent licensed contractors to remove sludge under procedure and supervision, connections locked off to prevent unintentional discharge.
General Operations	HMI control kiosk over entire plant with duty and stand by pumps, High level alarms and critical High-High alarms will shut down plant if required, SCARDA system for remote monitoring, critical spares held on site, dedicated employee resource for the plant All tanks bunded, emergency spill kits local to area, All surface and ground within the plant and vicinity drain back to and pumped to Balance tank.

4.4 Post Assessment

Following commissioning, the operators will follow routine monitoring protocols to assess whether odour nuisance may be caused beyond the Site boundary. Should odour be identified as causing environmental harm, corrective and preventative actions will be raised and managed through the internal SHEMS action tracking tool. Potential corrective actions could include, but are not limited to:

- Engaging third party odour monitoring specialists.
- Changes to operational practices.
- Infrastructural changes, such as consideration of abatement techniques.'

4.5 Monitoring

Dedicated engineering resource to the plant with daily inspection, maintenance tasks to be determined and implemented this will include odour emissions and any impact on the Environment.

External parties as detailed in section 3 will be used to determine any residual odours and advise on suitable and sufficient control measures.

5.0 Contingency Plans

5.1 Complaints

The following actions will be taken on receipt of an odour complaint.

1. The receptionist or Security guard who receives the complaint will record the complaint on the Resident Complaint Record (Ref – EMSAPP019).
2. The complaint will be reported as soon as possible to the site SHE adviser and the complaint will be investigated. The following assessment will be made.
 - Review of the site operations at the time of the complaint arising what activities / process were taking place,
 - Review the operative conditions of the control measures in place.
 - Review the meteorological conditions at the time of complaint.
3. Where it is found odour has been emitted and may have caused a nuisance corrective and preventative action will be carried out.
4. The complaint will be logged on the site odour complaint log.
5. Where requested a response will be provided to the individual complainant.
6. The complaint will be reported through to the Environment Agency covering the details of the complaint, the outcome of the investigation and action taken.
7. All complaints will be communicated through the site internal communication channels on a daily and weekly basis.

5.2 Engaging with neighbours

The site encourages and adopts an open and honest line of communication with the local residents and where contact details are left by resident's direct feedback will be given to those residents.

Where direct contact details are not held by the site due to the communication coming from a third party such as EA communications will be provided for ongoing communication by the third party.

We have done a lot of work with the local residents including presenting to them at their monthly meetings, hosting meetings on site to discuss the issues, the proposed provider of the new abatement equipment has attended and presented to them direct.

This will continue during the coming months as we install the new equipment and post installation to ensure we maintain a good neighbor relationship with them.

Regular engagement with the local residents has been key and will continue.

6.0 Emergency Conditions

Site preventative maintenance schedules reviewed regularly to ensure failure or emergency conditions are reduced to the lowest possible risk.

Site emergency procedures in place for failure of any part of the plant and extend to control measures for odour.

Odour abatement, motor failures, spillages, damage and security will be monitored with sufficient spares on site or within reach to prevent nuisance or breach of condition.

7.0 Review

The OMP will form part of an annual review of site environmental operations.

However it will be reviewed and updated in the event of

- An odour complaint being received,
- Evidence that the abatement equipment is not performing as required either through inspection or test
- Direction from the EA,

The review will include the effectiveness of the systems, controls and procedures in place and identify any areas where improvements can be made.