Pre-Operational Odour Management Plan V4.0

Proposed Poultry Processing Facility at the Maelor Foods Plant, Pickhill Lane, Wrexham

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1. Introduction

ADAS UK Ltd has been instructed by Mr Mulkh Mehta of Maelor Foods Ltd to produce a preliminary, pre-operational baseline Odour Management Plan (OMP) for a consented poultry processing facility at Pickhill Lane, Wrexham, LL13 0UE. Planning permission was granted for change of use of the Maelor Creamery site to a poultry processing facility on 2nd March 2015 (Ref; SES P/2014/0781). It is understood that planning consent was granted subject to a number of planning conditions, of which, condition 4 states that:

"The use hereby granted permission shall not commence until an odour management plan has been submitted to an approved in writing by the Local Planning Authority. All odour control measures set out in the plan shall be installed prior to first use of the premises for the purposes hereby granted permission and the site shall thereafter be operated in strict accordance with the odour management plan as approved"

In addition to planning obligations the plant will be regulated by Natural Resources Wales (NRW) under the Environmental Permitting (England and Wales) Regulations 2010 (EPR) for activities which fall within Section 6.8 Part A(1) (b) Slaughtering animals at a plant with a carcass production capacity of more than 50 tonnes per day., section 6.8 Part A(1) d(i) cutting and portioning of whole chickens, and section 5.3, Part A(1) (c) Effluent treatment plant (Disposal of non-hazardous waste with a capacity exceeding 50 tonnes per day, involving (i) biological treatment) This OMP has been prepared to support the environmental permit application (Ref. PPN-00003).

This OMP is based on the understanding that the Operator will implement the plan in its future operation of the poultry processing facility at Maelor Foods, to ensure that all reasonable measures are taken to control odour emissions, and in the event that an adverse impact is caused then prompt action will be taken to identify the source and apply corrective measures. It provides a schedule of actions that will be taken to help minimise odour impact and sets out site management procedures for the management of odour.

The OMP has been produced with reference to:

- **Environment Agency, H4 Odour Management: How to comply with your environmental permit. April 2011.**
- **Institute of Air Quality Management, Guidance on the Assessment of Odour for Planning. 2014.**

The Odour Management Plan document will be reviewed on a regular basis once the consented development is permitted and operational (at least annually) or more frequently if there are any changes to the activities and/or if any specific issues in respect of odour have become apparent.

Any amendments stemming from these reviews may need to be agreed with, and approved by NRW and / or the Planning Authority to meet the terms of the planning condition (No. 4).

NRW and the Planning Authority should be consulted at an early stage to ensure that the OMP can be amended in future, with the prior written agreement of the authorities, to ensure that any necessary and beneficial changes to odour management practices can be implemented without breaching the terms of this condition and to allow compliance with the EPR permit. Such changes may need to be made in the light of operating experience and/or if new developments or technologies become available in future so that facilities or practices can be adapted and optimised to further reduce odour impacts.

Odour Management Plans (OMPs) are required for all facilities regulated by the Environmental Permitting Regulations (EPR) with a significant potential for causing adverse odour impacts. The objectives of this OMP are to identify all significant sources of odour present at the facility (an odour inventory) and then provide information on management practices and the infrastructure in place to abate or minimise odorous emissions from the facility, as will be required by a permit condition.

The effects of emergency and abnormal circumstances on odour emissions are also considered.

Monitoring procedures are described to help validate the effectiveness of measures taken to control odorous emissions. The plan also outlines measures taken in the event of the detection of excessive odour during monitoring, with a view to reducing this odour to an acceptable level as soon as possible.

Response procedures are described in case odour related complaints are received from a neighbour of the plant, with procedures for recording all relevant information and investigating the potential cause of the odour release emissions.

2. Site Location and Plant Description

2.1 Site Location

The consented poultry processing facility is to be developed on the site of the disused Maelor Creamery, Pickhill Lane, approximately 1 km to the north-north-west of the village of Bangor-on-Dee and approximately 700m to the south-east of the residential area of Cross Lanes. The map at Appendix 1 shows the locations of potentially sensitive receptors around the plant.

There are small numbers of potentially sensitive residential properties located off Pickhill Lane, to the west of the proposed main poultry processing building, and also isolated residences to the north of the plant at Pickhill Old Hall and Whitegate Cottage. The close proximity of sensitive receptors on Pickhill Lane is such that there are risks of off-site odours being caused, and therefore means that high standards of odour management are required.

2.2 Plant Description & Initial Risk Assessment

The plant is concerned with the slaughter and processing of broiler chickens to produce chicken meat and chicken meat products for the food and retail markets. The follow paragraphs describe the key activities in each area of the plant, the odour risks in each area and the key control measures which will be used to reduce odour emissions and/or disrupt the pathways for odours to potential receptors. The odour risk of each area has been assessed based on experience gained at other UK poultry processing plants.

Lairage / Intake

Live chickens from broiler production farms will arrive at the plant in modules on HGV trailers. The HGV trailers will enter a lairage area, before moving to the intake area where the modules will be unloaded. Birds will be transferred from the intake area to the preliminary processing area where the modules will be loaded onto the intake line.

Lairage/intake areas typically generate very low levels of odour emissions from the birds themselves. Ventilation is required to maintain good working conditions and particularly to provide comfort for the birds held in this area prior to slaughter. Suitable volumes of very low concentration building air will be

extracted to atmosphere through roof mounted vertical discharge fans which to disperse emissions vertically at high level.

There will also be fans which blow air into, and re-circulate air within the building and around the module cages to provide enhanced cooling for the birds in warmer weather. This cooling air will be extracted from the building through the roof mounted extraction fans.

This is a LOW odour risk area of the plant.

Preliminary Processing Area

Birds will be transferred from the intake area to the preliminary processing area. The module cages will be loaded onto the intake line and the birds will be gas stunned, then removed from the modules and hung-on to the "shackles" of an overhead conveyor line and transferred to a bleeding area. In the bleeding area the birds' heads are removed and blood will drain into, and be collected in, a trough and pumped away at frequent intervals during the day to an enclosed and odour extracted blood storage tank in the offal collection bay. Blood will therefore be removed from the bleeding area before there is any odorous decay and this area will be thoroughly washed and sanitised at the end of each processing day, and this will alleviate the risk of odours from the decay of residues.

The empty modules (crates/cages) will be transferred to the "module washing" area and then transferred to the "box return" service area where they will be loaded onto empty HGV trailers for subsequent re-use in the collection of birds from farms.

Very low intensity odour emissions will arise from handling the modules and the birds as they are hung on to the conveying system but emissions are limited because: a) there will only be small numbers of birds in the stunning and hang-on areas at any one time, and b) there will be no significant changes to the state or composition of the chickens within these areas. It is also noted that fresh blood has no significant odour. Building headspace air from the preliminary processing areas will be extracted and dispersed through the roof mounted, vertical discharge, extraction fans. Floors and walls of the kill and bleed area are washed down and sanitised during night shifts and at weekends.

The bird hang-on area will have a specific extraction system with extracted air being treated/filtered through a dust filtration system to remove dust and feathers from the extracted air prior to high level vertical discharge and dispersion through a roof mounted stack.

This is a LOW odour risk area of the plant.

AeroScalder & De-feather

The birds will be slaughtered mechanically as they move around the conveying system. After bleeding the birds will be conveyed in to a de-feather room where they will be scalded by a saturated hot air system. The birds will be conveyed through the scalding unit to loosen their feathers to facilitate mechanical plucking in the de-feather area. This new technology provides a non-immersion scalding method that minimises water and energy use and has much lower odour emissions as it avoids the large volumes of water containing decaying organic matter that are normally involved in scalding.

The AeroScalder system is entirely enclosed and consists of two chambers; an air conditioning chamber where the moisturised hot air is prepared and, next to it, the scalding chamber itself through which birds are conveyed and into which the scalding air is blown. Moisturised hot air is blown forcefully onto the

most critical parts of the broiler, preventing over scalding of fragile parts. It penetrates and separates the feather pack, transferring heat effectively to the feather follicle. Air temperature depends on whether products are to be hard, medium or soft scalded.

Scald vapours are enclosed inside the unit but any escape of odorous air will be extracted directly into a chemical scrubber for abatement before dispersion to atmosphere through a tall stack.

The spent scald water within the air scalder is filtered and recirculated in the system. Separated waste and overflow water may have a high organic content but the volume flow for discharge to the effluent treatment plant is low so it that the effluent treatment system has a lower flow, and this will minimise balance tank.

Scalding has normally been a HIGH risk odour area of the plant as residual blood, and organic matter from the chicken's feet and feathers progressively decay in the warm water in conventional scald tanks during each production day. Odour emissions are much lower with the Aeroscalder technology, but as a precautionary measure provision is made to extract air from this area of the plant at high rates directly to a **chemical scrubber** odour abatement system. Chemical scrubbers have been used in a number of other UK poultry processing plants to treat higher intensity odour streams.

There will also be fresh air inlets to provide "cooling" air, which will in turn be extracted to the chemical scrubbing abatement system.

Evisceration

After de-feather/plucking, the birds will be mechanically eviscerated in an evisceration area. This involves removal of the birds' intestines and other internal organs (heart, lungs, gizzards, livers etc.). Evisceration does not generate significant emissions of odours because the intestines are not broken and the other organs are not odorous.

Building headspace air in the evisceration areas of the factory will be extracted directly to roof mounted extraction/dispersion fans for mitigation by high level dispersion.

Inedible offal removed during the evisceration process will be transferred by vacuum lines to the animal by-products trailer in the offal collection bay where it will be collected on a daily basis for off-site processing.

Edible offal will be transported away from the evisceration area for chilling and onward dispatch to customers. No offal is therefore allowed to accumulate in the evisceration area, minimising its potential as an odour source.

This is a very LOW odour risk area of the plant as the chicken offal is fresh and there is no decay. The building air will be extracted and discharged by roof mounted fans with short stacks.

Offal Bays – Loading & Removal Building

Feathers will be transferred in a water flume to the offal bay building where they will be separated from the flume water (which is recirculated) and the flume water will be drained down to the effluent treatment plant at the end of each day. The pressed feathers will be loaded into bulk trailers for transport off-site to a rendering plant. Feathers will be removed from the site on a daily basis.

Offal which is not fit for human consumption will also be transferred to the offal bay building where it will also be loaded into to trailers and transported off-site to a rendering plant on a daily basis.

The offal bay waste removal building will be fully enclosed and building headspace air will be extracted directly to the **chemical scrubber and stack** odour mitigation systems.

This is a MEDIUM odour risk area of the plant. Although the feather and offal material will be removed from site on a daily basis, before odorous decay becomes established, experience from other sites is that even small traces of animal protein residues on equipment and trailers do result in the generation of some odours.

Blood Storage Tanks

Blood from the bleeding area will be pump/transferred to a blood tank located inside a room housing the feather separation pit which has internal drains to the effluent treatment plant. Poultry blood is not sold on for further processing into foodstuffs for human consumption or pharmaceutical applications so the blood tank will not be refrigerated.

The blood tank will be sealed and fitted with a high level interlocked alarm to prevent overfill. It will have capacity to hold at least 110% of the maximum kill capacity of blood to cover contingencies such as transport delays.

The blood tank will be fully emptied at least daily and regularly cleaned to prevent build-up of odorous residues. There is potential for very high intensity odour emissions from the storage of blood if the blood decays in warmer weather, although this decay is limited in larger processing plants, such as this plant, by the frequent collection and removal of blood from the site. Use of a hopper bottomed tank means that all blood will be removed each time the tank is emptied, and therefore that there are no odorous residues in the tank. The blood storage tank will be connected directly to extraction ducting to the chemical scrubbing odour treatment system.

Air displaced from HGV road tankers collecting blood from the storage tank will be ducted directly into the odour extraction system. This will be achieved by tanker drivers connecting the outlet/exhaust of their tanker vacuum pumps to a flexible hose which will in turn be directly connected to the chemical scrubber abatement system extraction ducting.

This is a HIGH odour risk area of the plant and the building area will be fully enclosed and extracted directly at a rate of at least 3 air changes per hour to the **chemical scrubber and stack** odour mitigation systems.

Offal Cold Store

Offal material which is fit for human consumption will be transferred to chillers and cold storage areas, where it will be stored before transport off-site. The cold storage buildings will be kept refrigerated to prevent decay, and will be largely “sealed” by means of a cold-store type door. These are NEGLIGIBLE odour risk areas of the plant.

Module Washing

Module cages used to transport chickens to site will be washed in the “box washing” area. Low intensity odour emissions will arise from handling of the empty modules, and building air in the box washing area

of the plant will be extracted directly by roof mounted extraction fans for high level dispersion. This is a LOW odour risk area of the plant

Truck Washing

Unloaded HGV trailers will move from the intake area to the "truck washing" area where they will be completely washed down before moving to the "box return" area. Low intensity odour emissions may arise from truck washing operations, and air will be extracted directly by roof mounted extraction fans for high level dispersion.

This is a LOW odour risk area of the plant.

Module Return Area

Washed and sanitised module cages will be returned to the "box return" area where they will loaded onto clean HGV trailers. Insignificant odour emissions will arise from box loading operations as both the vehicles and the modules have been washed at this stage. Air will be extracted directly by roof mounted extraction fans for high level dispersion.

This is a VERY LOW odour risk area of the plant

Effluent Treatment Plant (ETP)

Effluent will be generated predominantly as contaminated wash water from the abattoir and specifically from the de-feather areas and the feather flume system.

The ETP is located downhill beyond the factory buildings, well away from the Pickhill Lane residencies.

Raw effluent will drain to a raw effluent pump sump and from there will be pumped through an enclosed rotary drum screen on top of the balance tank to screen out larger solids from the effluent before treatment. The primary screenings will fall into a skip and full skips will either be covered to minimise odour and keep rainwater out or else be stored inside. The screenings will be transferred into the ABP's trailer in the offal bays.

The balance tank has a retention time at peak flow of 12 hours. This will allow waste streams of high and low organic loading to be combined so the effluent plant will be presented with more even or "average" and more consistent pollutant load flows and not peak or more "concentrated" flows such as occur at the time of discharge of scald tank contents at the end of each production day. There is also a diversion tank which may be used occasionally to segregate effluent in abnormal events such as spillages or to recycle out of specification treated effluent. It is not envisaged that the diversion tank will be used other than very occasionally as a contingency. Low volumes of effluent produced by the Aeroscalder system are unlikely to overload the ETP and it will be adequately buffered in the balance tank.

The balance (and diversion tanks on the occasions when it is used) will be agitated by two venturi mixers to mix and aerate the contents and to maintain aerobic conditions and prevent them from going septic and becoming odorous.

The balance tank is an existing tank from the former First Milk effluent treatment plant installation. As this tank is open topped modelling has been used to assess the likelihood of odours from the tank contributing to offsite impacts. The odour modelling assessment therefore included emissions from the ETP area with an open topped balance tank and this modelling shows that it will not result in unacceptable

off-site odour impact. There are operational advantages in having open topped tanks in so much as this facilitates routine removal of any settled solids which might otherwise accumulate.

From the balance tank effluent will be transferred to a Dissolved Air Flotation (DAF) system to flocculate and separate/remove suspended solids, fats, oils and greases, from where the separated solids will be pumped to a covered sludge storage tank.

DAF plants can generate small volumes of quite intense and offensive odours, so that in this case the DAF plant will be fitted with a stainless steel cover with removable inspection hatches and the headspace will be vented directly to a passive carbon filter for odour removal.

The separated liquid from the DAF plant will be transferred to an activated sludge system tank for aerobic (activated sludge) treatment, prior to final settlement and discharge to river.

The odour from activated sludge tanks is much less offensive than from DAF plants and sludge facilities, and odours are not usually attributable to them unless the system has been overloaded and this has adversely affected the treatment.

In this case the activated sludge plant will consist of an anoxic vessel followed by an aeration tank where the conditioned mixed liquor will be injected with air via fine bubble air diffusion manifolds.

A final settling clarifier tank will remove the remaining suspended solids from the effluent backed up by a rotary disc ultrafilter to guarantee the final effluent quality.

Given the controls in place, the features of the ETP design and its relatively isolated location, there is a LOW odour risk from this area

ETP Sludge Storage Tanks

A sludge holding tank will store the combined DAF and waste or surplus activated sludge prior to transfer off-site for land spreading or injection by contractors. The sludge tank will be covered and a mixer will be used to keep the sludge mixed. The off gas from the tank headspace will be vented through a passive activated carbon filter.

Air displaced from HGV road tankers collecting sludge from the storage tank will be ducted into a portable, passive activated carbon filter system. This will be achieved by tanker drivers connecting the outlet/exhaust of their tank or tanker vacuum pumps to a flexible hose which will in turn be directly connected to the carbon filter. Odorous air will thus pass through the filters for treatment prior to release into the atmosphere.

Displaced air from the road tanker during sludge transfers will be fed into a portable passive carbon filter to abate odours.

There is a MEDIUM odour risk from this area of the plant

Odour Control & Mitigation Systems

Odorous emissions from those areas of the plant which generate the most intense odours, and in particular the de-feather, feathers/offal/waste removal areas, and the blood storage tanks will be

extracted to a chemical scrubbing system to abate odour. The abatement system will be based on two scrubbers, each comprising single stage chemical scrubbers with caustic soda and sodium hypochlorite scrubbing liquor and with a final mitigation stage of tall scrubber dispersion stacks to disperse residual odours.

The scrubbing system is a HIGH odour risk area of the plant as it will be abating air extracted from the most odorous areas of the plant and therefore effective scrubber operation is critical to controlling off-site odour impacts.

The off-site impact of room extraction air from the less odorous areas of the plant (lairage, hang-on area, bleeding, evisceration, and the module and trailer washing areas) will be mitigated by dispersion of building headspace air at high level through roof mounted fans. Air extracted from the bird "hang-on" area will be pre-filtered to remove dust before being discharged to atmosphere. These airflows represent LOW odour risk areas of the plant because of the low odour concentrations associated with these activities.

2.3 Key Odour Control Measures

The key proposed odour controls at the plant are summarised below:

1. The de-feather area will be fully enclosed and building air will be extracted to the wet chemical scrubber odour mitigation systems.
2. The waste removal or offal bays building will be fully enclosed and building air will be extracted to the chemical scrubbing system.
3. All feathers, offal and by-products will be removed from the site on a daily basis (before odorous decay sets in) and/or stored within a fully enclosed cold store.
4. All blood will be stored in a covered tank inside the offal bay building which will be extracted by duct work which transfer extracted air to the chemical scrubbing system.
5. All vacuum tankers collecting blood and sludge will "back vent" displaced air from the tanker vacuum pumps through flexible hoses into a duct which transfers air to the proposed odour abatement systems (scrubber and carbon filters respectively). Spills will be reported by tanker drivers and remediated immediately by site staff.
6. The floors and walls of the lairage, module handling and truck washing areas, kill and bleed, scald, de-feather and evisceration areas will all be washed down and sanitised on a daily basis during night shifts and at weekends, as required by the Meat Hygiene Regulations and the site's HACCP.
7. Factory headspace air will be extracted and dispersed to atmosphere through high level, vertical discharge roof fans.

3. "Waste" Inventory

3.1 Waste Storage and Disposal

A number of potentially odorous wastes will be generated on the site. Their potential to generate odour emissions is partly controlled by the duration of any storage on site. These wastes will be stored temporarily on site prior to removal for disposal or recovery off-site, and in the case of offal and feather will be removed on a daily basis A summary of the maximum quantities of the key potentially odorous wastes stored on site will be used to populate the table below before the plant become operational:

Table 1: Waste Inventory

Wastes	Daily Production (tonnes)	Maximum Storage on-site (tonnes)	Frequency of Removal from Site
Feathers	……	……	……
Blood	……	……	……
Offal (waste)	……	……	……
Effluent/Sludges	……	……	……

4. Source Identification & Review

Table 2 summarises the potential sources of odour for the poultry processing operations as well as factors which may influence odour emissions on site and the potential for variations in emissions. Table 3 addresses the nature of the odours and the key odour mitigation and control measures.

Table 2. Potential Odour Sources

Area On-site/ Source of Odour	Factors that may influence Odour Emissions
1. Lairage / Intake	Cleanliness of floor and frequency of cleaning/washing are key controls. The building will be sanitised on a daily basis
2. Module washing	Likely to be more odorous in warmer weather as chicken droppings will decay more rapidly, but all modules are washed immediately after use so that no accumulations occur. Floor and equipment cleanliness will all influence emissions.
3. Hang-on and bleeding area	Bird, floor and equipment cleanliness will all influence emissions. These areas are washed down at least once each day to prevent accumulations
4. Scalding unit & De-feather	Variations in levels of contamination of birds with droppings/litter (and resulting accumulations of solids in system). Effectiveness of air extraction system from factory to air treatment system will influence emissions.
5. Evisceration	Effectiveness of air extraction system from factory to stack(s) system will influence mitigation of emissions, but this is a low odour potential area of the plant and it will be sanitised on a daily basis as a food production area.
6. Bulk offal and feather handling and storage	Cleanliness of trailers, buildings and equipment will all influence emissions. Collection trailers are thoroughly sanitised before delivery to site to meet Animal By-Product regulation requirements. Length of storage of material on site is critical in warmer weather as odour potential can increase due to accelerated odorous decay of organic materials and residues. The size of the plant is such that material will be removed on a daily basis. Extraction to chemical scrubber provides effective disruption of odour path to receptors
7. Offal handling and storage in cold store	Promptness of material being transferred to the cold store. Material to be used in food products so that prevention of decay is critical.
8. Blood and effluent storage tanks	Length of storage of material on site. Effectiveness of air extraction. Odour potential of blood and sludge higher in warm weather with accelerated odorous decay. Residues of blood and sludge in tank after emptying Spillages in tanker loading area (blood or sludge) can cause short term emissions. Extraction to chemical scrubber provides effective disruption of odour path to receptors
9. Main extraction and air treatment system	Effectiveness of air extraction system from factory to air treatment system will influence emissions. Effectiveness of scrubber (evenness of air distribution and effectiveness of liquor pumping and dosing systems in maintaining optimum scrubber operations).
10. Tanker loading	Effectiveness of extraction hose/ducting system in controlling leaks of odorous air. Back vented into odour abatement systems (scrubber for blood or carbon filters for sludge tankers)

Table 3 provides commentary on the type and composition of odours in the various different parts of the plant. ADAS experience from Gas Chromatography-Mass Spectrometry (GC-MS) gas analysis on other comparable plants is that the odours associated with poultry and processing poultry specifically are typically complex mixtures of large numbers of different organic compounds and there are no predominant odorous compounds, Typically poultry processing odours will include alcohols, ketones, aldehydes acids, chlorine containing compounds, aliphatic, cyclic and aryl hydrocarbons and a number of sulphur containing compounds including sulphides. Sulphides are most likely to occur in the decay of feathers and blood, in vapours from the scald tanks, and in any anaerobic conditions in effluents and sludge.

Table 3 Odour Sources, Characteristics and Controls

Odour Source		Odour Controls		
Source	**Type of odours**	**Odour Reductions Measures at Source**	**Containment or Enclosure**	**Source Receptor Pathway Disruption**
1. Lairage (bird reception & holding)	Low intensity chicken related odour from birds in modules and from droppings on floors. Odour from poultry faeces are likely to be caused by volatilisation of ammonia and other odorous compounds, including hydrogen sulphide, skatole, indole, amines, mercaptans and other organic compounds containing sulphur	Lairage cleaned and washed on a daily basis as part of daily hygiene routines. Bird feeding restricted on farms immediately prior to delivery to Maelor site so that gut content and droppings output are minimised. Floor and equipment are all washed on a daily basis as part of daily hygiene. High rates of extraction to keep birds cool will prevent odours building up	All activities within enclosed lairage building area	High level roof fans/stack dispersion of room air
2. Module washing	Low intensity chicken related odours from droppings on modules A range of organic compounds, possibly including octanal and nonanal	Floor and equipment are all washed on a daily basis as part of daily hygiene routine. Modules will be washed as soon as empty	All activities within enclosed building area	High level roof fans /stack dispersion of room air
3. Hang-on and bleeding area	Low intensity chicken related odours from birds in modules and when handled during hanging on to line. A range of organic compounds as above, and possibly including octanal and nonanal	Floor and equipment all washed on a daily basis as part of daily hygiene routine. Blood collection tanks will be emptied throughout each production day to ensure no decay odours.	Enclosed in primary processing area.	Localised air extraction to dust (feather) filter for hang-on area and high level dispersion of filtered air through extract fan and roof stack system
4. Scald Tanks & De-feather	Odour emissions from Aeroscalder and de-feather are lower than from conventional scald tank systems Odours made up organic compounds typically including methyl mercaptan, dimethyl sulphide, 2, 3 butandione, dimethyl sulphide, and nonanal	Emissions will be reduced at source by restricting birds feed intake prior to slaughter and by the nature of the “dry” scalding system	The Aeroscalder system is enclosed within the de-feather rooms and the rooms are separately enclosed within the overall plant building.	Process air is extracted to chemical scrubbing systems for abatement and treated air then discharged at high level from scrubber stack to disperse residual odours.
5. Evisceration	Low intensity, inoffensive odours of fresh “meat” arising from organ and gut removal from carcasses.	Intestines are not broken during evisceration and feed is withdrawn prior to slaughter. Floor and equipment all washed on a daily basis as part of daily hygiene routine and wastes and products are removed from the room throughout each day.	All plant fully enclosed within evisceration room which is itself within the main umbrella building	Extraction of room air and high level dispersion of extracted air by roof fans/stacks

Odour Source		Odour Controls		
Source	**Type of odours**	**Odour Reductions Measures at Source**	**Containment or Enclosure**	**Source Receptor Pathway Disruption**
6. Bulk offal & feather handling/storage	Potentially offensive odours from decaying feather and by-products, but primarily from small traces or residues on surfaces. Odours are a complex mixture of organic compounds which may include dimethyl sulphide, dimethyl trisulphide, octanal and nonanal	Empty trailers are cleaned and disinfected before delivery to site. Plant will be washed down on a daily basis. Feathers and by-products will be removed on a daily basis. Offal bay building doors kept closed when not in use for vehicle movements	Offal trailers and loading equipment within enclosed building with air extraction at a rate of at least 3 air changes per hour.	Building air extracted to chemical scrubbing system for abatement and treated air discharged at high level from scrubber stacks to disperse residual odours.
7. Product “offal” and carcass products for food use.	Low intensity, inoffensive fresh “meaty” odours from offal and carcase products	Handling and storage in dedicated chiller and cold storage area. Handling bins and building areas are washed after each use and kept clean for re-use.	Handling and storage in dedicated and enclosed food product area, with chiller and cold storage.	Although potentially putrescible all materials for human consumption will be stored in a refrigerated room/cold store area to maintain quality and thereby to prevent decay and control emissions.
8. Blood Storage Tank and feather pit room	Potential for highly offensive faecal/sulphidic odours from decaying feathers and blood and from traces of blood on surfaces. Odours are a complex mixture of organics which may include sulphides and mercaptans and indole if blood decays.	Frequent (daily) removal of blood from tank and the feather pit and flume cleaned out each day. Blood tank will be emptied completely to remove residues. Any spills will be washed away and the tank area will be kept clean as part of daily hygiene routines.	The blood tank will be fully enclosed to control emissions and evaporation and all feather pit facilities will be housed within a room. There will be direct odour extraction from the tanks headspace and the room to the odour control system.	Air/odour will be extracted from the tank headspace and the room to the chemical scrubbing systems for abatement. Treated air will be discharged at high level from scrubber stacks to disperse residual odours
9. Blood Tanker Loading	Potential for highly offensive faecal/sulphidic odours from decaying blood and from traces of blood on surfaces. Odours are a complex mixture of organics which may include Sulphides, mercaptans and indole if blood starts to decay	Frequent (daily) removal of blood from tank. Tank will be emptied completely to remove residues. A “hopper” bottomed tank will be used to facilitate complete emptying. Any spills will be washed away and the tank area will be kept clean as part of daily hygiene routines.	The blood tank will be housed within a building and air displaced from vacuum tankers during filling will be back vented to the chemical scrubber odour treatment system through a flexible hose connected to the tanker air outlet/vacuum pump exhaust.	Air will be extracted from the tank headspace during tanker loading to chemical scrubbing systems for abatement. Treated air will be discharged at high level from scrubber stacks to disperse residual odours

Odour Source		Odour Controls		
Source	**Type of odours**	**Odour Reductions Measures at Source**	**Containment or Enclosure**	**Source Receptor Pathway Disruption**
10. Effluent Balance and Treatment Tanks	Some potential for offensive odours from decaying effluent. Odours from effluent are a complex mixture of organics which may include sulphides and mercaptans	Tanks will be emptied routinely to prevent accumulations of solids and the balance tank will be aerated by venturi aerators to maintain aerobic conditions in balance tanks. Activated sludge process is an aerobic process. Dissolved Air Flotation system will be de-sludged and cleaned out at monthly intervals	DAF unit will have a removable cover with inspection hatches and will be vented to a passive carbon filter. Sludge tanks will be fully enclosed to control emissions and evaporation.	Effluent plant is located 200m from nearest receptors on Pickhill Lane and 280m from Pickhill Old Hall so that odours will be diluted and dispersed over the distances between source and potential receptors.
11. Effluent Plant Sludge Storage Tanks	Potential for offensive odours from decaying sludge. Sludge and effluent odours are complex mixtures of organic compounds which may include sulphides and mercaptans if sludge is allowed to decay anaerobically.	Sludge tanks will be emptied routinely so that sludge “age” is limited. Any spills will be washed away and the tank area will be kept clean as part of daily hygiene routines	Tanks will be fully enclosed to control emissions and evaporation, and tank headspace air will be displaced through an activated carbon filter.	Effluent plant is located 200m from nearest receptors on Pickhill Lane and 280m from Pickhill Old Hall so that odours will be diluted by distance. Odorous air will be displaced to atmosphere through activated carbon filters (to abate organic compounds) with carbon impregnated with an oxidising agent (caustic soda or copper oxide) to oxidise sulphides.
12. Sludge Tanker Loading	Potential for offensive odours from decaying sludge. Sludge and effluent odours are complex mixtures of organic compounds which may include sulphides and mercaptans if sludge is allowed to decay anaerobically.	Sludge tanks will be emptied routinely so that sludge “age” is limited. Any spills will be washed away and the tank area will be kept clean as part of daily hygiene routines	Tanks will be fully enclosed to control emissions and evaporation, and displaced tanker headspace air will be passed through an activated carbon filter.	Tanker drivers will connect air hoses from tanker vacuum pumps exhaust outlets to activated carbon filters so that displaced air is abated during filling. Potential exposure limited by limited duration of the activity which at most will be 2 x <20 minutes per day
13. Main Extraction and Chemical Scrubbing System	Treated odours may have a “chlorine” component from the sodium hypochlorite oxidising reagent and any chloro-amines generated in the scrubber.	Chemical scrubbing with automated controls on chemical dosing and liquor recirculation to ensure optimum treatment.	All odour extraction ducting will be maintained under extraction so that any air “leakage” is inwards and odours are contained.	Extraction system will have sufficient flow rate to capture air emitted from odorous processes. Treated air will be discharged at high level through stacks to disperse residual odours.

5. Odour Risk Assessment

A qualitative odour risk assessment is included below in Table 3. The risk assessment has been prepared with reference to Horizontal Guidance Note H1- Annex (b) (2010) and is based on qualitative risk assessment methodology, where a judgement of risk of an odour impact is assigned based on the 'Source-Pathway-Receptor' Model.

A subjective risk score has been calculated for each identified odour source based on a potential Impact score "**I**" (scored from 1 to 5), which is a subjective measure of odour intensity/emission rates, multiplied by a Likelihood "**L**" score (also from 1 to 5). The overall risk score assumes that specified suitable control measures are in place, however, the bracketed scores with asterisks provide an assessment of the potential risk if odour controls are not effective or not effectively used/monitored. As an example if air is not effectively extracted from the de-feather area, then there is significant increase (from 2 to 4) in the likelihood of off-site odours.

The risk assessment has been based on the following risk matrix scoring system suggested by the Environment Agency for a poultry processing site in East Anglia and used in other sectors, including the National Health Service.

Risk Matrix

	Likelihood				
Impact	**1**	**2**	**3**	**4**	**5**
	Rare	**Unlikely**	**Possible**	**Likely**	**Almost Certain**
5 Catastrophic	**5**	**10**	**15**	**20**	**25**
4 Major	**4**	**8**	**12**	**16**	**20**
3 Moderate	**3**	**6**	**9**	**12**	**15**
2 Minor	**2**	**4**	**6**	**8**	**10**
1 Negligible	**1**	**3**	**3**	**4**	**5**

For grading risk, the scores obtained from the risk matrix are assigned grades, as follows;

	1 – 3	Low risk
	4 – 6	Moderate risk
	8 – 12	High risk
	15 – 25	Extreme risk

Table 4 Odour Risk Assessment and Key Odour Controls to Control/Minimise Risks

Inventory		What can harm/ be harmed?			Managing the risk		Assessing the risk	
Source	**Process (Location)**	**Hazard**	**Receptor**	**Potential Impact 'I'**	**Risk Management**	**Likelihood of of exposure 'L'**	**Magnitude of Risk 'I' x 'L'**	**Overall Risk**
1. Lairage (bird reception & holding)	North-east section of factory (new extension)	Odour from birds in modules and from droppings on floors	Closest receptors (owned by Maelor) on Pickhill Lane at approx. 140 m West of lairage area of plant.	1 - Negligible	Lairage cleaned and washed on a daily basis as part of daily hygiene routines. Bird feed restricted on farms prior to delivery to processing site so that gut content and droppings output reduced	3 - Possible	3 - Low	Not significant if thoroughly washed routinely
2. Module washing	Southern section of factory	Odours from droppings on floors & equipment	Closest receptors on Pickhill Lane (approx. 140 m to West of bird reception area of plant.	1 - Negligible	Enclosed and floor and equipment are all washed on a daily basis as part of daily hygiene routine. Modules will be washed as soon as empty	1 - Rare	1 - Low	Not significant if well managed and kept clean
3. Hang-on and bleeding area	Central section of factory	Odours from birds in modules and when handled during hanging on to line	Closest receptors on Pickhill Lane (owned by Maelor) are approx. 140 m to West of primary bird reception area of plant.	3 - Moderate	Enclosed. Floor and equipment all washed on a daily basis as part of daily hygiene routine. Modules are all washed as soon as empty. Building air extracted to dust filter (hang-on area) and high level dispersion through extract fan and stack system.	1 - Rare	3 - Low	Low
4. Aeroscalder & De-feather	Central section of factory	Odour emissions from Aero-scalder and de-feather are a potential hazard.	Closest receptors on Pickhill Lane (owned by Maelor) are approx. 115 m to West of primary bird processing area of plant.	3 - Moderate	All fully enclosed. Aeroscalder design minimises odour and vapour releases. Process air (and thereby building air) will be extracted at source to the chemical scrubbing system. Main extraction system must have sufficient flow rate to capture all air emitted from scalder & de-feather process to building headspace.	2 - Unlikely	6 - Moderate	Medium dependant on effectiveness of extraction and abatement system

Inventory		What can harm/ be harmed?			Managing the risk		Assessing the risk	
Source	**Process (Location)**	**Hazard**	**Receptor**	**Potential Impact 'I'**	**Risk Management**	**Likelihood of of exposure 'L'**	**Magnitude of Risk 'I' x 'L'**	**Overall Risk**
5. Evisceration	Northern section of factory	Odour from gut removal	Closest receptors on Pickhill Lane (owned by Maelor) are approx. 115 m to West of primary processing area.	1 - Negligible	Low odour because intestines are not broken All fully plant enclosed within building. Building air extracted odour mitigation system. Main extraction system must have sufficient flow rate to capture all air emitted from evisceration to building headspace.	2 - Unlikely	2 - Low	Moderate depending on effectiveness of extraction & mitigation
6. Bulk offal & feather handling/storage	Northern section of factory	Odours from decaying feather and by-products and residues on surfaces	Closest receptors on Pickhill Lane (owned by Maelor) are approx. 140 m to West of offal bay area.	3 - Moderate (4 - Major)*	Fully enclosed. Building air extracted to chemical scrubbing system. Extraction system must have sufficient flow rate to capture all air emitted from offal bays to building headspace. Empty trailers should be cleaned and disinfected before delivery to site. Plant should be washed down on a daily basis. Feathers and by-products should be removed on a daily basis. Doors must be kept closed when not in use for vehicle movements	2 - Unlikely (4 - Likely)*	6 - Moderate (16 - Extreme)*	Medium to Extreme depending on both the effectiveness of extraction & abatement and the frequency of removal of offal and feathers. Risks will be controlled with effective extraction and scrubbing
7. Offal Handling in Cold Store	North-west section of factory	Odours from decaying by-products and residues on surfaces	Closest receptor on Pickhill Lane (approx. 100m to West of processing area of plant.	2 – Minor (3 – Moderate)*	Fully enclosed and refrigerated Potentially putrescible materials will be stored in refrigerated building to maintain quality and thereby to reduce and contain emissions. Handling bins and building areas will be washed after each use and kept clean. Frequent removal of by-products should take place (daily)	1 – Rare (3 – Possible)*	2 – Low (6 – Moderate)*	Low - not significant if managed carefully

Inventory		What can harm/ be harmed?			Managing the risk		Assessing the risk	
Source	**Process (Location)**	**Hazard**	**Receptor**	**Potential Impact 'I'**	**Risk Management**	**Likelihood of of exposure 'L'**	**Magnitude of Risk 'I' x 'L'**	**Overall Risk**
8. Blood Storage Tanks and feather pit area	Northern section of factory	Odours from decaying blood and feathers	Closest receptors on Pickhill Lane (owned by Maelor) are approx. 140 m to West of blood tank area.	4 – Major (4 – Major)*	Tanks will be fully enclosed to control emissions and evaporation. Air extracted to chemical scrubbing system. Frequent removal. Blood will be removed daily and tanks will be emptied completely to remove residues. Feather pit area cleaned daily	2 – Unlikely (3 – Possible)*	8 – High (12 – High)*	Risk will be fully controlled if extraction is effective and if tanks emptied frequently. Elevated risk if extraction & abatement plant fails or if there are any spills.
Blood tank – collection by tanker	Northern section of factory	Odours from decaying blood	Closest receptors on Pickhill Lane (owned by Maelor) are approx.140 m to West of blood tank area.	4 – Major (4 – Major)*	Tanker drivers must ensure that they connect air extraction hoses to tanker vacuum pumps exhaust. Air displaced from vacuum tankers during filling will be vented to the chemical scrubber air treatment system. Ensure tanker drivers report any spills. Potential exposure during offloading limited by duration of the activity which at most will be <20 minutes per day.	2 – Unlikely (3 – Possible)*	8 – High (12 – High)*	Not significant if managed carefully and if account is taken of short term and infrequent nature of the activity, which is likely to be approximately 15-20 minutes once per day
9. Effluent Treatment Plant	Eastern edge of site activities	Odours from decaying effluent	Closest receptors on Pickhill Lane (owned by Maelor) are approx..290 m to West of effluent plant. Pickhill Old Hall is around	3 – Moderate (4 – Major)*	Enclosed drum screen and screenings collected in covered skip. Open balance and divert tanks are aerated by venturi to prevent anaerobic conditions. Divert tank only to be used to capture spillages / abnormal effluent streams to prevent overloading ETP and will be cleansed after use. DAF plant will be covered to control	2 – Unlikely (3 – Possible)*	6 – Moderate (12 – High)*	Not significant if plant is maintained within normal operating parameters and extraction and abatement is effective.

Inventory		What can harm/ be harmed?			Managing the risk		Assessing the risk	
Source	Process (Location)	Hazard	Receptor	Potential Impact 'I'	Risk Management	Likelihood of of exposure 'L'	Magnitude of Risk 'I' x 'L'	Overall Risk
			270m North of effluent plant		emissions and evaporation with air ducted to carbon filter.			Elevated risk if plant malfunctions or extraction & abatement plant fails or if there are any spills.
10. Sludge Storage Tanks	Eastern edge of site activities	Odours from decaying sludge	Closest receptors on Pickhill Lane (owned by Maelor) are approx..290 m to West of effluent plant. Pickhill Old Hall is around 270m North of effluent plant	4 – Major (4 – Major)*	Tanks will be fully enclosed to control emissions and evaporation. Displaced air ducted to carbon filter treatment system.	2 – Unlikely (3 – Possible)*	8 – High (12 – High)*	Not significant if containment and abatement is effective. Elevated risk if extraction & abatement plant fails or if there are any spills.
11. Effluent plant sludge tanker loading	Eastern edge of site activities	Odours from decaying blood and sludge in air displaced from tankers during loading.	Closest receptors on Pickhill Lane (owned by Maelor) are approx..290 m to West of effluent plant. Pickhill Old Hall is around 270m North of effluent plant)	3 – Moderate (4 – Major)*	Tanker drivers must ensure that they connect air extraction hoses to tanker vacuum pumps exhaust. Air displaced from vacuum tankers during filling will be vented to a carbon filter air treatment system. Ensure tanker drivers report any spills. Potential exposure limited by limited duration of the activity which at most will be 2 x <20 minutes per week	2 – Unlikely (3 – Possible)*	6 – Moderate (12 - High)*	Not significant if managed carefully and if account is taken of short term and infrequent nature of the activity, which is likely to be approximately 15-20 minutes once or twice each week

Inventory		What can harm/ be harmed?			Managing the risk		Assessing the risk	
Source	Process (Location)	Hazard	Receptor	Potential Impact 'I'	Risk Management	Likelihood of of exposure 'L'	Magnitude of Risk 'I' x 'L'	Overall Risk
12. Main Extraction and Chemical Scrubbing System	To east of main factory building	Treated air odours which are likely to be of a "chlorine" nature, possibly with undertones of "offal" type odours	Closest receptors on Pickhill Lane (owned by Maelor) are approx.190 m to West of scrubbers and their stacks and Pickhill Old Hall is approximately 300m from scrubbers and stacks	4 - Major (4 - Major)*	Extraction system must have sufficient flow rate to capture air emitted from odorous processes. Automated scrubber dosing / liquor replenishment system and controls. Plant must be carefully monitored to ensure that it is working within design parameters.	2 – Unlikely (3 – Possible)*	8 – High (12 – High)*	Low risk if performance optimised. High risk, if not, so performance is critical

6. Management of Odour

This OMP is a working document, intended to be used as a reference document for operational staff on a day to day basis. It provides a schedule of actions that will be taken to minimise odour and waste impact and details site management procedures for the management of odour.

The OMP will be printed and available on-site to all site personnel and any visiting officers from Wrexham County Council or NRW.

The environmental management system will address odour and we will use and review the Odour Management Plan to ensure we minimise odour from the installation. The management systems will include:

- Staff roles and responsibilities
- Training of staff
- Operating procedures
- Auditing and inspections
- Preventative and breakdown maintenance
- Housekeeping standards
- Incidents and emergency response
- Complaint handling and investigation
- Community liaison

The remainder of this document is structured according to aspects of the operation and management of the proposed site.

All measures, contained in this OMP will be implemented in the daily operation of the site. Additional measures that will be adopted in response to incidents or one-off events are detailed in the contingency procedures section.

7. Roles & Responsibilities

7.1 Site Management

The overall implementation of this OMP will be the responsibility of the Site Manager, supported as required by other Maelor Foods staff with specific roles relating to odour control. The roles and responsibilities of staff will be documented under the EMS. The Site Manager can delegate certain tasks as required, although ultimate responsibility will remain with him / her.

A nominated deputy will be appointed for all times when the Site Manager is not on site. In such circumstances, it will be the nominated deputy's responsibility to ensure that the requirements of the OMP are adhered to.

7.2 Staff Training

Staff training will be a key aspect of ensuring that odour can be controlled through effective management during daily operations. All key site operatives involved in "odour" related areas of the plants, and particularly the offal and effluent sections and maintenance personnel responsible for the scrubbers, will be trained on induction with "tool-box talks" to deal with odour management issues in the areas in which they will work. They will also be made aware of the existence of this OMP and its requirements through

environmental training tailored to staff responsibility levels. Training needs are to be reviewed for all staff on an annual basis and refresher training scheduled at set intervals.

Training in odour management will form part of the site induction process to all new members of staff or contractors working in potentially odorous areas of the plant.

Where investigation of an incident identifies a gap in training or a need for refresher training this will be carried out as soon as possible.

7.3 Operating Procedures

All departments will have a set of operating procedures that cover specific and generic tasks. These procedures will identity areas where odour could be released and specify the measures that must be taken to ensure that odour is minimised. The procedures will cover the measures to be taken if abnormal events occur, such as spillages and plant failure and spell out the reporting and recording criteria if abnormal events occur.

Plant whose failure could cause an odour event will be covered by operational procedures, such as the chemical scrubber, carbon-filters and ETP.

7.4 Maintenance

Any plant item whose failure could cause an odorous release is to be covered on the preventative maintenance (PM) system which will schedule a series of maintenance tasks at set frequencies. The PM system will include regular checks and maintenance of doors, extraction systems, building fabric, odour abatement plant, ETP and process plant to minimise failure events and keep odour control optimised. The tasks and their frequency are based on plant manufacturer's guidance or site experience of operating the plant. We will hold stocks of essential spare parts so plant can be repaired as soon as possible and we will have same day call out contracts for the main elements of the plant if specialist help is required.

Breakdown maintenance will be prioritised if there is potential for or an actual release of odour. We will undertake environmental risk assessments if we need to undertake maintenance tasks that could release odour and identify precautions and additional measures that we must take to control odour during the work. This could include work on building doors or roof if they need to be opened for prolonged periods. Wherever possible we will schedule such work for non-production days and favourable weather patterns to minimise the potential for offensive odour releases to reach site neighbours. We would also issue neighbourhood bulletins to advise neighbours in advance of such work.

There will be a clear structure of responsibility which allows operational staff to call in specialist contractors to deal with emergencies and unplanned events which may lead to an odour impact, such as leaks and spillages, damages to extraction ducts etc.

Such events, and appropriate remedial measures would normally be the responsibility of the Site Manager, but lines of responsibility and delegation will be clarified in case the manager is off site when an unplanned event occurs. A list of approved contractors who can be called out to deal with incidents will be maintained in the site office and all staff with delegated responsibility should be aware of this list.

7.5 Sub-Contractors

Any sub-contractors working at the site will be subject to the requirements of the OMP. Failure to comply with odour control measures will result in a formal warning to the operative and his or her employer. Failure to comply with the warning will result in the operative being banned from the site.

7.6 Measures for Reducing Odorous Emissions On-site – Auditing and Inspections

Maelor Foods will seek to address all reasonable opportunities to reduce odorous releases from the site. Measures for reducing the risk have been detailed throughout the document. Audits and inspections will be also carried out across departments covering housekeeping and adherence to procedures where they address odour. Departmental Managers will also undertake their own checks, inspections and audits as part of the shift handover process.

The specific odour management and odour related checks and tasks have been listed below. This list will be reviewed as the plant is commissioned and throughout its operation:

Table 5. Routine Odour Management & Monitoring

No.	Tasks	Responsible Person(s)	Targets/Action Levels
		Daily Checks	
1	Inspect the site for odour emissions twice daily during the hours of production (whether it be during the day or night), and record the findings to determine trends. Frequency to be increased in event of complaints		Checks to include: 1. Cleanliness and condition of bulk offal bay building. 2. Doors closed on offal buildings when not in use for vehicle movements. 3. Blood tank area cleanliness. 4. Cleanliness of lairage & module handling areas. 5. Screens and drainage in offal bays. 6. Effluent treatment plant for normal functioning, no abnormal parameters or odours, spills 7. Tanker loading operations (drivers back venting air from tankers)
2	Site perimeter odour assessments or SNIFF tests (daily initially -1st 6 months) at different times of day. To be carried out by personnel NOT involved in production or wastes areas to avoid odour desensitisation.		Detectable/recognisable odours. Back track up plume if odours are detected and carry out site checks as set out at 2 above.
3	Check operation of extraction fans and odour scrubbing system twice each day. Scrubber pH and Redox levels and fan operation will be monitored and logged continuously and the control system fitted with alarms to warn of exceptional conditions or failures (To ensure that the air treatment system is operating within design parameters.)		1. Ensure that fans are running and any drive belts have not broken. 2. Check chemicals/reagent stock levels for scrubber. 3. Spot checks on scrubber monitoring system, pH and redox values. 4. Liquid level in scrubber 5. Check chemical dosing pump operation 6. Check air dampers/shutters are in correct positions. 7. Check scrubber blowdown/overflow drain.
4	Measure/check and record pressure in extraction system		To ensure that the extraction system is operating normally. The extraction system will be checked on a daily basis along with key operating parameters for the odour scrubbing system.

8. Abnormal Events and Emergency Operation

We will plan contingency measures to deal with the foreseeable abnormal events that could have an effect on odour emissions from the installation Table 6 describes a number of abnormal events or emergencies which may take place at the site and lead to odorous emissions and lists the response measures.

Table 6: Abnormal Events and Emergency Operation

Scenario / Event	Location on Site	Likely effect on emissions inventory	Response Measures
Special event circumstances in locality or Extreme weather, e.g. periods of unusually hot weather	All wastes, effluents and by-products	Potential increased rate of bio-degradation of wastes and increased odour emissions	Greater focus on handling and storage practices for all wastes and effluents, plant cleanliness and abatement plant performance. Increase frequency of off-site odour checks. Increase frequency of tasks in checklist at Section 7.
Failure of odour control measures	Site	The control measures proposed are all simple and low tech so the risk of failure is low. If failures do occur, then the potential effect would be an increased risk of off-site effects	All maintenance staff will be trained in identifying problems with control equipment or systems and applying simple fixes. For mechanical plant, such as fans and scrubber dosing and liquor circulation pumps, a supply of essential spares will be kept on site and on-call arrangements will be made to facilitate safe access.
Odour control flow/pressure anomaly – no flow, pressure drops too high or too low	Extraction systems	Odour may escape from de-feather & evisceration area roof space	Re-check/investigate fan operation. Check ducting for leaks or blockages (e.g. with flow meter). Investigate scrubber conditions Carry critical spares for fans and scrubbers
Unavailability of site staff	Odour control plant failure	Incidents occurring outside of site hours may be exacerbated by lack of staff available to attend.	Emergency contact details to be agreed such that someone is available on call to address issues which may arise.
Fire	Odour control plant	Low risk but potential increase of emissions at nearby properties	Immediately contact emergency staff and provide training to staff in dealing with on-site emergency.
Flood	Entire Site	Potential increase of emissions at nearby properties	Immediately contact emergency staff and provide training to staff in dealing with on-site emergency.

Site power cut	Entire Site – Production areas and odour controls	Odour emissions from most important primary process area sources are likely to fall. Emissions from effluent treatment plant sources may increase without treatment processes	Extraction systems should be prioritised as/when power systems are restored. A back-up generator contingency will be in place – unit to be supplied within 24 hours if power interruption persists.

The site will have an incident or emergency response procedure which will cover the generic aspects of how to respond and who to notify. We will also have more specific procedures such as a spillage procedure to cover types of incident. Other events are to be covered in the standard operating procedures such as how to address effluent treatment plant faults.

We will treat door faults, extraction or abatement plant failures and any other incidents that cause or could lead to an odour release as an environmental incident. Such incidents are to be handled in accordance with site incidents procedures and we will ensure they are fully investigated and recorded once resolved.

We will report incidents to NRW in accordance with of the environmental permit. These notifications will comprise of an initial report to notify NRW of a potentially significant incident as soon as possible followed by a report covering the incident investigations and conclusions.

9. Record keeping

Throughout the whole of the OMP, accurate and thorough record keeping are essential to ensure odour is controlled and will allow us to review and analyse performance. We will keep records of maintenance of plant, production, waste management, monitoring, audits and inspections, communication, incidents, complaints and training.

Our Production Managers are responsible for keeping records of vehicle arrivals, departures, load details, materials processed and records of any incidents or issues that occur. They will also maintain a shift log of processing stages which detail any abnormal events or faults requiring maintenance.

10. Odour Complaints Procedure

The measures outlined in this OMP are aimed at preventing odour emissions occurring to the extent where complaints may be made by neighbours of the site. Nevertheless, it is recognised that having an established complaints procedure is a necessary part of the OMP.

The primary role of the odour complaint procedure is to ascertain whether any odour complaints are linked to the site and associated operations and, if so, to identify the cause(s) and what action may be taken to remedy any on-going complaints episode and to prevent or minimise the probability of a recurrence.

Neighbours impacted by odour from the plant might submit their complaints directly to NRW without informing site management. This should be discouraged as there is likely to be a significant delay between NRW receiving the complaint and notification being received by the plant from the NRW that an odour related complaint had been received, probably precluding the possibility of a meaningful investigation into the cause of the problem at the time it occurs.

The management system will include procedures to deal with incidents, handle complaints and contingency planning.

All environmental incidents and complaints are to be reported to the Site Manager or delegated person who records the details and initiates an investigation. The Site Manager ensures that the relevant internal and external parties are notified in a timely manner. There will be a defined hierarchy of Managers who handle complaints when the Site Manager is unavailable.

It will be the responsibility of the site manager (or delegated personnel) to deal with any complaints that may be received by the site. The name and contact phone number of the site manager/contact will be made freely available to local residents and businesses.

On receipt of any such complaints, the standard procedure for dealing with these complaints will then be as follows:

Stage 1: Complaint received

The site manager or regulatory authority receives a complaint alleging potential odour from the installation.

Stage 2: Communicate

The primary reason for investigation of complaints is to identify the likely cause and source of the odour.

Where complaints are made direct to the site, NRW will be informed without delay by telephone or e-mail. NRW or the Council (if complaints are made to the Council) will be encouraged to relay any complaints received by them to the site at the earliest possible opportunity so that investigations into the validity and cause of the complaint can be carried out at the time, or as soon as possible afterwards.

Stage 3: Record

The complaint's details and the investigation shall be recorded in accordance with the requirements set out in the odour complaint report form in Appendix 1.

All completed complaint forms will be retained in a file on site for at least two years and made available for inspection by the regulatory authority on request.

Stage 4: Respond

The site manager or a delegate deputy will respond as rapidly as possible after a complaint is received so that an effective appraisal of the complaint can be made. Where possible, this assessment shall be conducted at the location of the complainant to help improve the identification of the odour in terms of site operations.

Site personnel will be willing to accompany a NRW officer during any odour complaint investigation procedures it may instigate. The intention of this is to facilitate the precise identification of the odour source if at all possible.

If it is not the officer's preference to carry out such odour investigations with site staff then this will be complied with, although it may be more difficult to precisely identify the source of the odour and take appropriate remedial action to prevent future odour impacts without site staff being present.

Stage 5: Identify the source and cause of complaint, and take remedial actions

In order to successfully resolve odour problems, it is essential that the site and the regulatory authority fully understand the source and cause of the odour and the operational conditions that led to the complaint.

Procedures for identifying emission sources and applying corrective action are detailed in below.

The complainant should be informed of the result of any investigation into the causes of the odour complaints and of any remedial action taken to reduce the odour to an acceptable level as soon as possible.

10.1 Source Identification

Personnel who are investigating complaints should give a description of the odour and whenever possible try to identify the source of the odour. It is therefore important that personnel carrying out such assessments have experience of the different types of odours generated in the various different areas of the plant (e.g. lairage/chickens, de-feather, offal, effluent, sludge, blood tanks etc.)

Odour events may also be related to a particular set of weather conditions (for example, sustained warm, still weather), and hence recorded and forecast weather conditions will be referred to.

The first step will be to investigate the odour complaint and reference the time of the complaint on complaint investigation/record form (see Appendix 2). In particular, record nature of the operations ongoing at the time, the results of any observations made on site and the wind and weather conditions. This will allow a broad assessment to be made of whether the site was likely to be principally responsible, or whether other sources were involved.

If the odour in question is considered to be at a level to cause nuisance at the complainant's location or property, then further investigation will be made around the area to characterise the odour and its likely source. This could include "back-tracking", by walking into an odour plume on the ground, or as a desk exercise with a site map and wind direction data (recorded or observed at the time of the incident).

If the installation is identified as a potential source, appropriate remedial actions can be taken if appropriate as specified in Sections 5, 6 and 7 to check if there have been any breakdowns or other issues that could affect odour.

All personnel carrying out investigations should be adequately trained and in particular should recognise that wind directions are record with respect to the direction FROM which the wind is blowing – i.e. a **west** wind blows **from the west** towards the east.

10.2 Meteorological Monitoring

A wind sock will be installed and wind direction and general weather conditions will be recorded in a site log at set intervals during the day, or if necessary a recording weather station will be installed. This weather data will be retained on site to assist the retrospective investigation of complaints, particularly in putting complaints in the context of wind speed and wind direction at the time.

It will also assist in identifying high risk periods when wind is carrying towards receptor properties and therefore when particular attention should be paid to odour control measures.

10.3 Corrective Action Measures and Reporting

Once the source has been identified, corrective action will be applied by the site manager in liaison with the regulatory authority as necessary. Corrective actions for reasonably foreseeable events are addressed in the task list.

All the details of the odour complaint, its investigation and corrective measures taken will be retained on site and notified to the regulator as is expected to be required by the permit.

11. Odour Monitoring

11.1 Plant Monitoring

The checklist in Table 5 at section 7.5 details routine plant and odour mitigation monitoring checks.

We will also undertake olfactometry testing of the chemical scrubber exhaust stack(s) during commissioning to check the odour destruction efficiency and confirm that the scrubber is meeting the design specification. This will be repeated after a further 12 months and/or as required by the permit.

11.2 Sniff Testing

Regular sniff testing will be carried out to identify any off-site odours and the odour strength in ambient air. This will be based on a "slow" walk around the boundary of the premises (and not restricted to the process boundaries) and will include two assessments at pre-determined locations around the site boundary as marked at locations 1 and 2 on the map in Appendix 3. Initially these assessments will be carried out on a daily basis at different times of day for the first six months of plant operations, and then if boundary odours are not experienced frequently the sniffing will be carried out on a weekly basis and as required in the event of an odour related complaint, as described above.

If odours are detected at any point the assessor will stop and assess the intensity and persistence of the odour and make observations using the form in Appendix 3. The locations of any odours will be marked on a dated map (such as that shown in Appendix 3) attached to the recording form, and cross-referred on the recording form.

Sniff tests will be carried out by suitable person(s) with experience of the different types of odours generated in the various different areas of the plant (e.g. lairage/chickens, de-feather, offal, effluent, sludge, blood tanks etc.), but it is very important the assessor does not work in any areas of the plant where they are routinely exposed to odours which would adversely affect their sensitivity to these odours.

Odour will subjectively assessed using the following criteria:

- Nature of odour detected, e.g.
  1. No odour detected
  2. Lairage/chickens,
  3. De-feather/scalding
  4. Offal,
  5. Effluent,
  6. Sludge,
  7. Blood tanks
  8. Other (Describe)

- Detectability and Intensity:
  1. No detectable odour
  2. Faint odour (barely detectable, need to stand still and inhale into the wind
  3. Moderate odour (odour easily detected when walking and breathing normally)
  4. Strong odour
  5. Very strong odour

- Extent and Persistence:
  1. Local and transient, not detected off Site
  2. Transient, detected off site for brief periods
  3. Persistent but localised
  4. Persistent and pervasive, detected over a narrow range
  5. Persistent and pervasive, detected over a broad range

The following information should also be recorded when carrying out odour monitoring:

- Any abnormal process conditions
- Any faults or overdue maintenance on odour abatement equipment
- Ambient temperature
- Information on any other odour generating activity taking place upwind of the plant
- Odour intensity (see above)
- Description of smell
- Time/duration of test
- Odour source (if apparent)

The results of sniff tests will be recorded on the record sheet, a copy of which is included at Appendix 3.

Odour monitoring results will be regularly reviewed (initially monthly, and then quarterly after the first year of operation) to evaluate the effectiveness of the odour abatement measures in use at the plant, identify circumstances that cause increased odour emissions that may require additional odour abatement or mitigation measures and identify new techniques that could be effective in further reducing odour from the plant going forward.

This information will also be used to review this Odour Management Plan and its effectiveness.

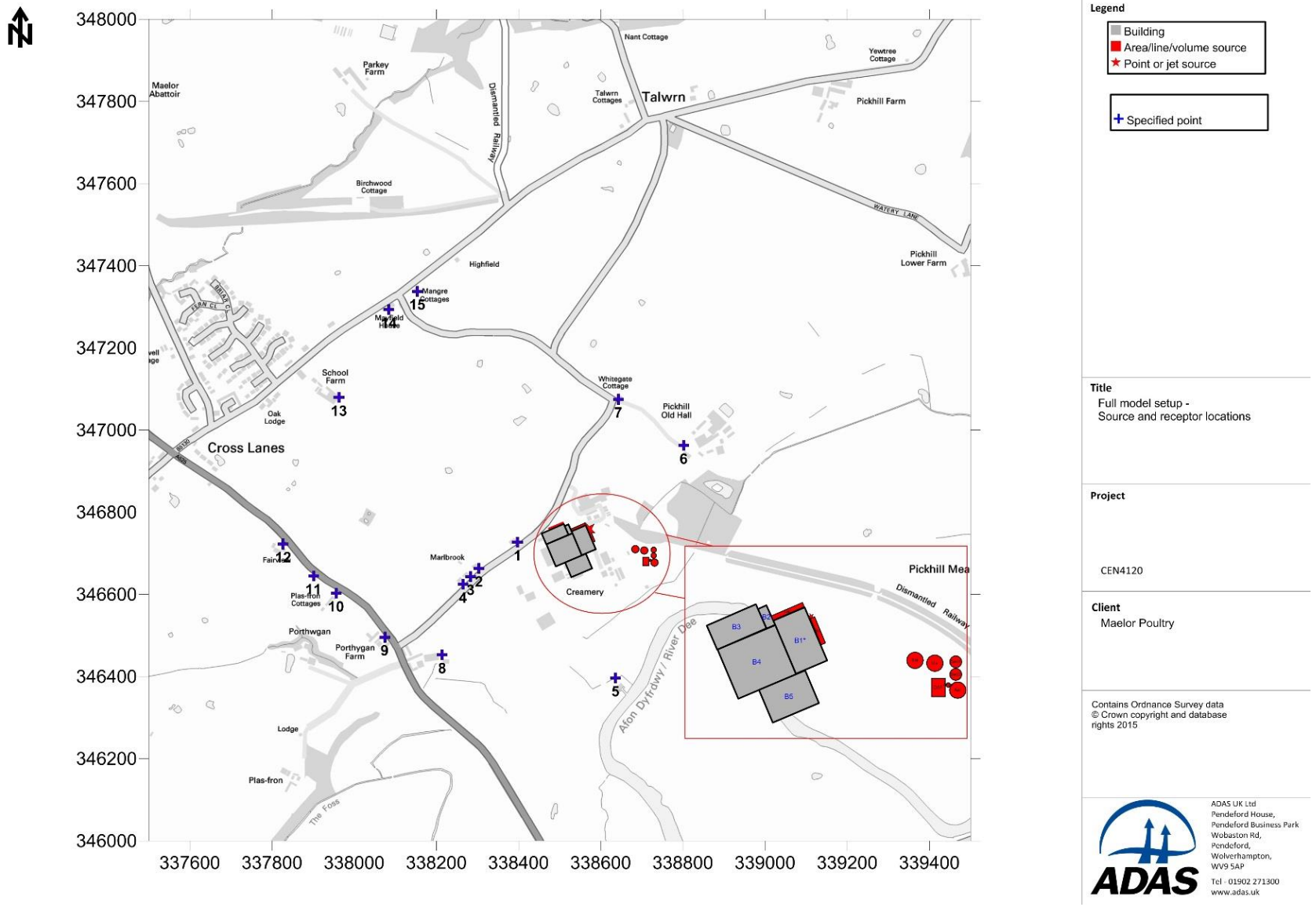
It is envisaged that the odour abatement techniques described in Section 5 above will be effective at reducing the odorous emissions from the plant to an acceptable level and that the instances in which excess odour from the plant causes complaints from neighbours will be very infrequent.

11.3 Community Liaison

It is important that neighbours who could potentially be affected by odour from the plant are made aware that the company takes the issue of odour control very seriously and has taken positive steps to reduce the plant's environmental impact on the local community. Neighbours of the plant will be kept informed of developments and will be issued with contact details to use to notify the company or to complain in the event of unacceptable odours being experienced.

Residents will be strongly encouraged to report any odours at the time they are experienced so that timely investigations can be carried out.

Appendix 1: Potential Odour Receptors



Legend

- Building
- Area/line/volume source
- Point or jet source
- Specified point

Title

Full model setup -
Source and receptor locations

Project

CEN4120

Client

Maelor Poultry

ADAS UK Ltd
Pendeford House,
Pendeford Business Park
Wobaston Rd,
Pendeford,
Wolverhampton,
WV9 5AP
Tel - 01902 271300
www.adas.uk

Appendix 2 Odour Complaint Form

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 (eg flow rate, pressure at inlet and pressure at outlet):	
Actions taken:	
Form completed by:	Date Signed

Intensity

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

Appendix 3 Sniff Survey Record Form

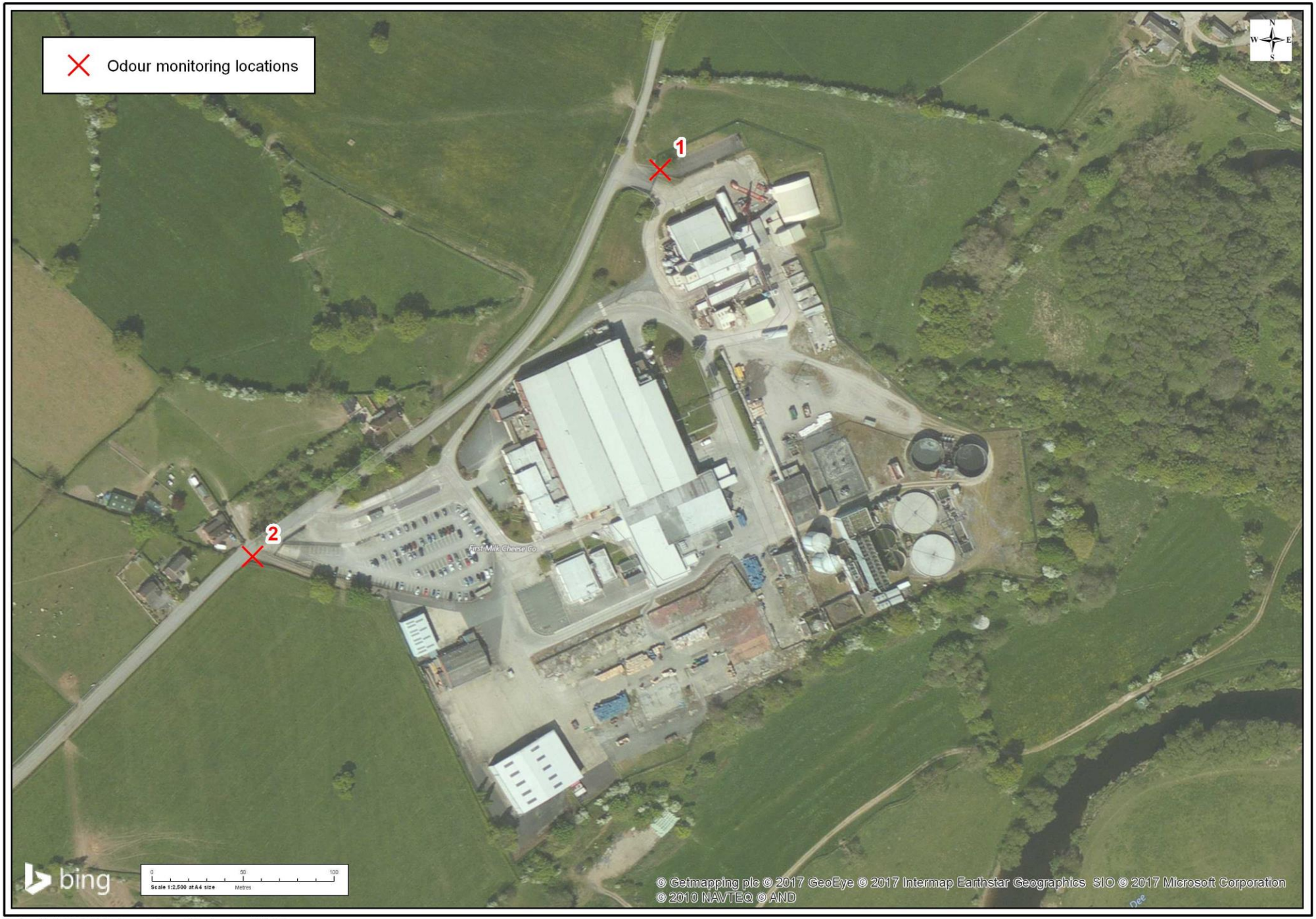
Odour Monitoring Results Date ……

Name ……

Locations	Time	Nature of Odour (1-8)	Detectability & Intensity (1-5)	Extent & Persistence (1-5)
1				
2				
Other (specify below)				

Nature of odour detected	Detectability and Intensity	Extent and Persistence
1. No odour detected 2. Lairage/chickens, 3. De-feather/scalding, 4. Offal, 5. Effluent, 6. Sludge, 7. Blood tanks 8. Other (Describe)	1. No detectable odour 2. Faint odour (barely detectable, need to stand still and inhale into the wind 3. Moderate odour (odour easily detected when walking and breathing normally) 4. Strong odour 5. Very strong odour	1. Local and transient, not detected off Site 2. Transient, detected off site for brief periods 3. Persistent but localised 4. Persistent and pervasive, detected over a narrow range 5. Persistent and pervasive, detected over a broad range

		Comments
Any abnormal process conditions (Y/N) Any faults or overdue maintenance (Y/N) Ambient Temperature (°C) Other odour generating activity upwind (Y/N) Odour source if identifiable		



Produced by RSK ADAS Environment Group, Wolverhampton, WV9 5AP.