Tegel Foods Ltd

Carmen Road Processing Site

Odour Management Plan

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Note: Draft document to be updated following completion of consent hearing process, and confirmation of the specific requirements of any consent conditions

Contents

1 Introduction

1.1 Background

Tegel Foods Ltd operates the Carmen Road Processing Site located in Hornby, Christchurch. Previously the site has been granted two resource consents by Environment Canterbury (ECan) to discharge combustion products from the operation of six boilers and a smokehouse, and to discharge odorous compounds from protein recovery (rendering) at the site (CRC971639.1).

The air discharge consent CRC971639.1 is available in BraveGen and on the ECan website. It is not appended to this management plan to ensure the latest version is viewed at all times.

Currently the site is in the process of renewing the air discharge consent and this plan does not reflect consent conditions as these are not yet available.

1.2 Purpose

Condition 2 of resource consent CRC971639.1 (for the smokehouse and protein recovery plant discharges) requires that the discharge *shall not cause odour that is offensive or objectionable, to the extent that it causes an adverse effect at or beyond the boundary of 112-120 Carmen Road Hornby*.

The purpose of this Odour Management Plan is to describe the management and operational procedures that will be implemented at the Carmen Road site to minimise odour and achieve compliance with the above consent condition.

The OMP has been prepared with reference to Appendix 1 of the Ministry for the Environment's *Good Practice Guide for Assessing and Managing Odour* (2016).

The procedures for the management of discharges to air of contaminants, other than odour, are not described in this OMP.

1.3 Overview of the Site

1.4 Site description

The subject site is a large industrial property covering 4.27ha in Hornby, Christchurch. The site is owned and operated by Tegel and has functioned as a poultry processing facility since the 1950s. It contains a large amount of buildings on site to house the various aspects of the poultry processing facility. The facility operates as further detailed below.

1.4.1 Live bird area

The live birds are brought to Hornby in catching modules loaded on flat deck trucks and trailers. The trucks and trailers are open sided for animal welfare reasons. The modules are unloaded and stored in the enclosed Live Bird Reception and Storage area until required for processing.

The ventilation in the Live Bird area is limited to natural flows induced by static roof vents and slow moving fans designed to keep the air moving past the birds without causing cold spots. When required for processing, the birds are loaded onto a hanging line that transports them through the plant.

The area is cleaned every day between deliveries and there is a more comprehensive clean once a month.

The Live Bird reception area is fully roofed with walls on all sides. Gaps have been left between the external wall and roof to facilitate air movement around the birds. The first birds are currently received at the site around 12am, with live birds delivered until around 1pm. These hours are typical hours rather than fixed hours.

1.4.2 Primary processing

The birds pass from the hanging bay to the kill room on a continuous overhead conveyor system, and are humanely slaughtered. The kill room houses the stunner and auto kill, the blood collection area, the scalder (aerated hot water bath) and the plucker.

The transfer machine then passes the birds through the eviscerator room where internal organs are removed and the birds are washed. Air extracted from the scalers is via extraction hoods and discharged from two stacks of 18m in height located above the processing plant. All other ventilation occurs via horizontal fans located on the north wall.

After the offal is removed the birds are transported to the spinchiller room containing large chlorinated ice/water baths. Here the birds are passed through the baths and are chilled to 6°C. They then enter an Acidified Sodium Chlorite (ASC) bath for final sanitisation. The ASC system is held under negative pressure and has an associated exhaust extraction fan.

The main source of odour from the primary processing area is from the scalder. This is an aerated hot water bath (58°C) through which the birds pass prior to plucking. It helps to loosen the feathers but also washes off much of the dust and faecal matter from their plumage. The odour generated is therefore a hot, wet and dirty feather smell sometimes described as 'wet dog'.

The scalder has an extraction hood over it which draws all air and steam from the facility and discharges it via the two 18m scalder stacks on the primary processing roof.

Primary processing usually occurs from 5am to 4pm (approximately) Monday to Friday.

1.4.3 Secondary processing

The secondary processing areas are used for the processing and packing of whole birds and the cutting of birds into portions. The packed cartons are then chilled or frozen and then dispatched to the holding warehouse via a conveyor system. Ventilation of the area occurs via horizontal extraction fans. As the secondary processing occurs at chilled temperatures and does not involve the application of heat, little odour is generated from this part of the process.

Typically the secondary processing area operates between 6am to 3pm (approximately) Monday to Friday with occasional Saturday processing.

1.4.4 Smoke house

The Christchurch plant contains the only smoke house operated by Tegel and is used to create smoked poultry products. The smokehouse consists of five steam ovens, smoked product has approximately 30 minutes of wood generated smoke applied prior to cooking. Discharging from relatively short chimney stacks. The smokehouse operates currently for up to 16 hours per day, 5 and a half days a week. Non-smoked batches (cooks) take on average just under 1.5 hours to complete. Smoking batches take longer, taking approximately 3.5 hours with the smoking phase taking 44 minutes on average. Smoking therefore occurs intermittently over the day. The smokehouse can emit a low level smokey odour and small quantities of white smoke.

1.4.5 Turkey processing

The site also contains the only turkey processing plant for Tegel in New Zealand. The turkey plant operates in the same manner as the main chicken processing plant, but is much smaller to accommodate the reduced bird numbers. It is located on the rear half of the site adjacent to the protein recovery plant. The current operating hours of the turkey plant are up to 8 hours per day, 5 days a week. Turkey processing varies seasonally, with up to six days a week in advance of the Christmas period.

1.4.6 Offal handling/ protein recovery

All soft meat by-products are transferred to the protein recovery plant. The protein and oil content of these by-products are recovered by the application of heat (rendering). By-product material is also received from the Brinks Chicken processing facility.

Offal, blood and feathers do not generate odour when they are fresh. However if they start to become rancid, decay or to dry on equipment they can produce a 'rotten meat' odour.

Within the plant itself there are measures in place to contain, extract and treat odorous air. This utilises equipment such as vacuum fans, extraction fans, containment, and the biofilter.

1.5 Overview of Site Resource Consents

1.6 Existing resource consents

The site holds existing resource consents for the following:

- M35/8902, M35/3662 and M35/7227 - bore/well consents
- CRC010188 –take of groundwater
- CRC011017 –take of groundwater
- CRC054334.2 –discharge of contaminants into air (boilers)
- CRC052405 discharge of contaminant to land and water
- CRC971639.1 –discharge of contaminants into air (smokehouse and protein recovery plant)

1.7 Other consents and approvals required

No other consents are required.

2 Responsibilities

2.1 Roles and Responsibilities

Tegel Foods Ltd is the holder of Consent CRC971639.1 and has the ultimate responsibility to ensure that conditions of the consent are complied with and the operational processes are carried out in accordance with the OMP.

Roles and responsibilities of relevant managers are as follows.

Position	Responsibilities
Chief Executive Officer	Accountable for the Company environmental performance, including ensuring adequate budget and resourcing so that the performance standards noted in all resource consents are complied with.
Site Manager	Accountable for the site's environmental performance, including application for budget and resourcing so that the performance standards noted in the resource consents are complied with. Point of contact for enquiries or complaints from the community.
Engineering Manager	Operation and maintenance of PRP and associated infrastructure e.g. piping, sumps, biofilter. Maintenance of plant associated with odour mitigation i.e. stacks, fans, bag filters Development and implementation of documented Standard Operating Procedures (SOP's) that and are understood by those in positions that influence the potential of odours from the site operations.
Production Manager	Operation and maintenance of live bird reception areas (turkey and chicken), primary and secondary processing Development and implementation of documented Standard Operating Procedures (SOP's) that and are understood by those in positions that influence the potential of odours from the site operations including waste management.
Production Manager - Smokehouse and Further Processing	Operation and maintenance of smokehouse and further processing department Development and implementation of documented Standard Operating Procedures (SOP's) that and are understood by those in positions that influence the potential of odours from the site operations including waste management.
Distribution Manager	Development and implementation of documented Standard Operating Procedures (SOP's) that and are understood by those in positions that influence the potential of odours from the site operations. The main aspect being product dumps and waste management to ensure no odour issues arise.
Regional EHS Manager	Support the development and implementation of site environmental management plans, including this odour management plan. Support the site to meet the requirements of the environmental consents, permits and other agreements held by the site. Monitor to ensure resourcing, responsibilities, systems and procedures are in place and are understood. These procedures include investigating and closing-out audit corrective actions, performance standards, non-compliances and complaints. Point of contact with environmental regulators.

2.2 Staff and Contractors

All Tegel staff and contractors working on the site are responsible for ensuring that their activities comply with the relevant resource consents and the directions of their Manager or Tegel contact.

2.3 Training and Competencies

The EHS function are responsible for developing and delivering environmental training and this is generally delivered as part of the EHS Calendar. This includes general site induction information which is found in the National Environment, Health And Safety Manual Appendix 06.

It is the responsibility of the relevant department manager to implement relevant environmental training and induction programme for all contractors and staff.

The purpose of this programme is to make all personnel working on site aware of and understand the purpose and requirements of the resource consent conditions and the ramifications of a failure to comply with these requirements.

The induction training programme for all contractors and staff will include at least the following aspects:

- The permit to work requirements that requires the identification of any aspects of the proposed activity/work to be undertaken that has the potential to impact the environment and inclusion of control plans to be implemented to avoid/minimise odours and any other environmental effects;
- Are aware of the responsibilities of all staff and contractors to carry out work on site in a manner that does not result in adverse effects on the environment and in accordance with resource consent conditions.

3 Activity Description

3.1 Description of the Surrounding Area

The site is located at 112 Carmen Road in Hornby, Christchurch, approximately 7 km from the Christchurch CBD. The site and the immediate surrounding area is zoned a mixture of General Industrial or Heavy Industrial, with Residential zoning across SH1 to the west and across Buchanans Road to the north. Hornby High School and St Bernadette's School are located approximately 350 m to the south-west and west, respectively. Other activities in the area include a petrol station, mechanical workshops, storage facilities, offices and recreational facilities.

Figure 3.1 Location plan **Source: Canterbury Maps Viewer, 2016**

Whilst Tegel's activities are consistent with the expectations of the Industrial zone there are some existing potentially sensitive activities including a trampoline park, schools and recreational facilities. Residential areas where sensitivity to odour will be high are also located west of Carmen Road and north of Buchanans Road. Of particular relevance is the proximity of these sensitive activities to the protein recovery plant on the site, which has the potential for the greatest impacts on amenity.

Sensitive activity	Address	Approximate distance from protein recovery plant
Mega Air Trampoline Arena	106 Carmen Road	150m
Safari Meats and SA Shop	100 Carmen Road	300m
Inflatable World Hornby	81 Buchanans Road	240m
Action Indoor Sports Stadiums	81 Buchanans Road	240m
Coupland's Bakeries	140 Carmen Road	311m
Residential dwellings across SH1	Bella Rosa Drive, Tirangi Street	316m
Residential dwellings across Buchanans Road	Cicada Place	326m
Hornby High School	180 Waterloo Road	350m
Hornby Primary School	190 Waterloo Road	400m

3.2 Meteorology

The closest meteorological station is the Kyle Street, Riccarton station which is located approximately 6km from the site. The weather station is operated by NIWA as part of their air quality monitoring programme. A wind rose based on data from the weather station for Kyle Street is presented in Figure 1. This is expected to be broadly representative of weather conditions at the subject site. The predominant wind direction is from the northeast, with the next predominant wind direction from the southwest. This is similar to wind patterns throughout the Canterbury Plains.

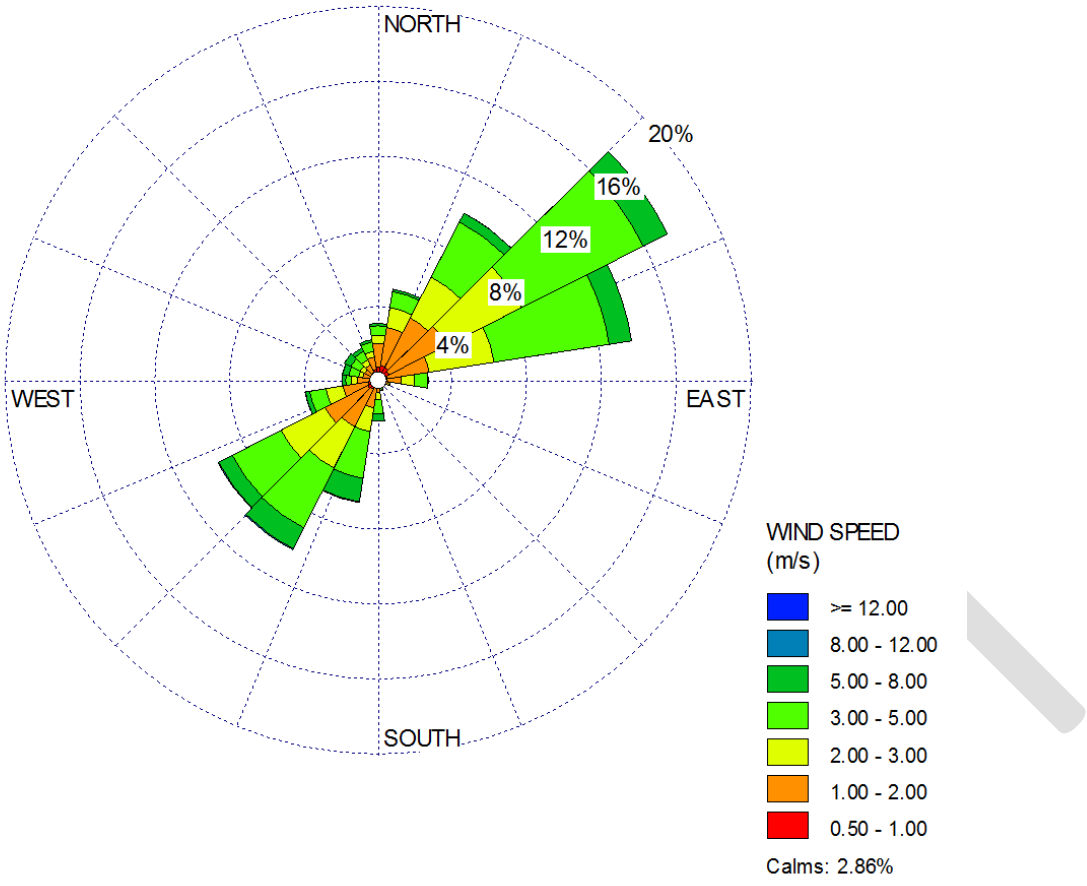


Figure 1: Frequency of wind speeds and directions measured at Kyle Street, Riccarton 2008-2017 (1-hour average data)

4 Odour Sources and Mitigation Procedures

4.1 Objective

To minimise the emission of odours from the site and to ensure site emissions do not generate objectionable odour outside the site boundary.

4.2 Consent Requirements

Consent CRC971639.1requires that there shall be no discharge to air that results in odour that is objectionable, to the extent that it causes an adverse effect at or beyond the boundary of the site. *[Note: to update consent requirements at the conclusion of the consent hearing process]*

4.3 Sources of Odour Emissions

The following table sets out those processes and activities on site which may lead to discharges and establishes the controls and responsibilities for the ongoing management of these risks.

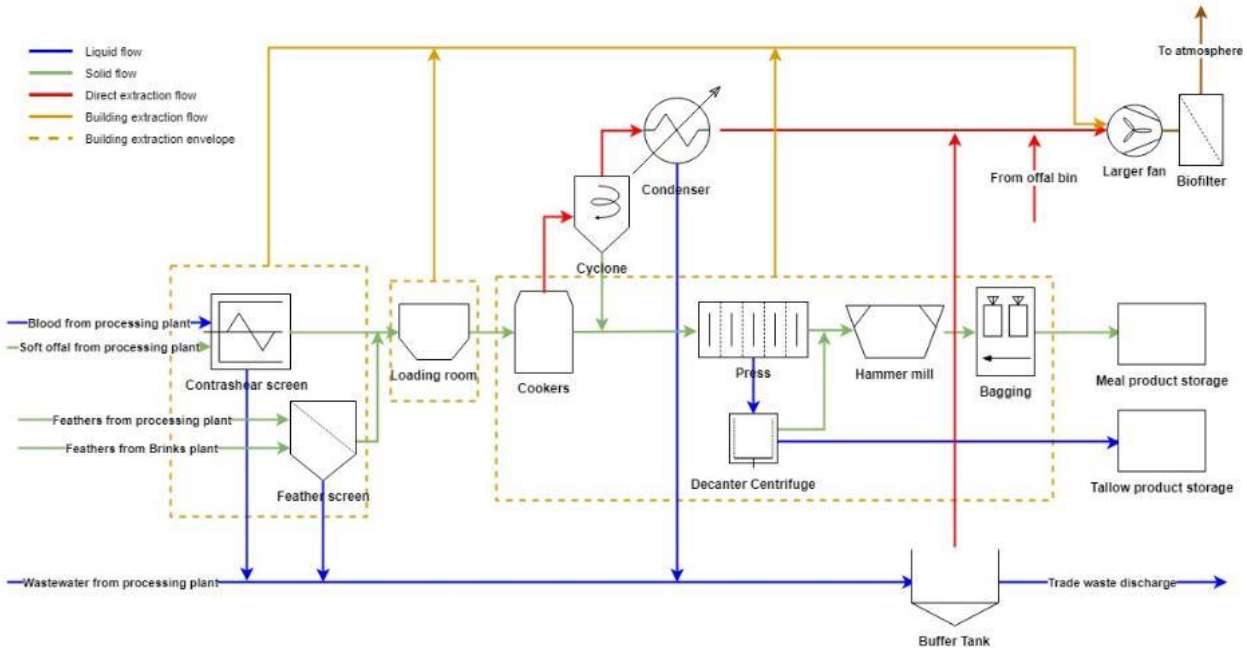
4.3.1 PRP Emissions

Odorous compounds may be generated through the decomposition of organic material during the treatment, storage and transfer of offal, feathers and wastewater.

Odour sources are :

- Cooker venting
- Sumps
- Offal reception – augers, contrashear, brinks bin
- Biofilter

Figure 4-1: Process flow diagram for by-products rendering, air extraction and wastewater conveyance activities at the PRP (current configuration)



The wastewater, feathers and offal generated from the manufacturing processes generally have a relatively low odour risk when “fresh” and aerobic conditions are maintained. However, the odour risk of the waste material increases over time if anaerobic conditions develop. Therefore, avoiding extended retention times of the waste, routine cleaning of sumps, tanks and handling plant, and other associated good housekeeping practices are also required. A thorough preventive plant maintenance programme, including ensuring identified critical spares are available at all times, help ensure the plant can satisfy performance expectations. Monitoring procedures are in place and these enable tracking of performance of which odours forms part.

Objectionable odours should not be generated from PRP during normal operating conditions, however due to the open nature of wastewater sumps and holding bins, there can at times be localised odour.

Higher odour emission rates may occur during abnormal operating conditions. Possible upset events when higher odour emission rates could occur include the following:

- Extended offal holding periods;
- Simultaneous venting of cooks;
- Loss of electrical power;
- Mechanical failure; and
- Spills which are not cleaned promptly.

Steps to avoid these events occurring (or mitigate effects if they do occur) are described throughout this document.

4.3.2 Scalder Emissions

Some odour is also emitted from the scalding process which occurs in Primary processing. The height of the scalder extraction stacks ensures that odour is well dispersed.

4.4 Emission Control Procedures

4.4.1 Operational Controls

The various operations are undertaken in accordance with documents procedures and standard operating procedures.

The environmental management framework is included in the National EHS Manual. Appendix 33 deals with the management of air discharges.

Department	Potential source of contamination	Key Potential Risks	Controls		Contingency	Responsibility	Monitoring
			Physical	Procedural			
Primary	**Bird delivery and storage.** Crates of chickens are delivered to the site by trucks and placed into designated storage areas within the lairage.	Potential discharge of odour, dust and feathers. Bird odour has not been associated with strong intensity in odour observations	Storage areas are covered and partly enclosed with ventilation for animal welfare purposes. Ventilation fans direct air onto site. Feed withdrawal reduce	Regular housekeeping in lairage.		Primary Team Leader	Pre-op checks include hygiene

Department	Potential source of contamination	Key Potential Risks	Controls		Contingency	Responsibility	Monitoring
			Physical	**Procedural**			
			faecal load. Birds are protected from rain. Staggered delivery with limited time to kill. Truck wash with every delivery.				
	Kill Room (blood collection, scalders, pluckers)	Potential discharge of odour from this area.	Discharged via stacks on roof designed to disperse any odour above ground level. Continuous flow of water through the scalders and cleaning at the end of each shift to avoid build-up of organic matter.	Full clean following production shift.		Primary Team Leader	Pre-op checks include hygiene.
	Offal, blood and feather waste transported via pipework to rendering	Sump overflow or spillage	Covered collection area for offal, feathers and blood. High level alarm in sump.	Cleaned by factory wash water. Rendering within 24 hours		Primary Team Leader	EHS/Quality Snapshot Audits.

Department	Potential source of contamination	Key Potential Risks	Controls		Contingency	Responsibility	Monitoring
			Physical	Procedural			
	Rendering bins Reject carcasses and chicken parts, plus dumped product are collected in bins for daily pick up by PRP staff.	Potential odours from unclean bins or aged product.	Lidded bins.	Training and Awareness. Rendering within 24 hours. Keep bins enclosed. .	Use sodium metabisulphate as needed. Disposal via licensed waste contractor	PRP Team Leader	

	Rendering	Offal cooking odour.	Enclosed building,which is extracted via the biofilter. Direct extraction of cookers and other sources to the biofilter. Electronic controls to ensure that simultaneous venting of cookers does not occur. Pre-planned maintenance schedule on BWM Pedestrian doors are fitted with autoclosers Product is loaded into containers at a purpose-built location which avoids the need to open the roller shutter door. Closed windows	Regular housekeeping, Management of cooking process to avoid excessive load on odour control system, processing within 24 hours. Use of sodium metabisulphate for stabilization of material if required. Doors and windows are closed except for movement of personnel or products entering or exiting the building or when the internal temperature exceeds 35°C and causes a health and safety issue for operators.	Disposal via licensed waste contractor Failure to adequately implement controls around doors and windows will be investigated to identify improvements	PRP Team Leader Technical Team	SCADA monitors biofilter moisture, pH and back pressure GMP Audit

Department	Potential source of contamination	Key Potential Risks	Controls		Contingency	Responsibility	Monitoring
			Physical	Procedural			
	Offal tower and Brinks bin	Fresh offal does not pose an odour risk however aging offal does	Enclosed contra shear and feather screen	Product rendered within 24 hours. Daily post production cleaning and regular housekeeping throughout the shift. Use of sodium metabisulphate if required.	Disposal via licensed waste contractor	PRP Team Leader	
	Waste water storage		Enclosed tank with extraction to biofilter	Waste water is discharged when the tank is full which typically is in the early afternoon, within 24 hours of production		PRP Team Leader	
	Smokehouse ovens Wood smoke discharge	Smokehouse odour has not been identified in off-site odour observations or noted in complaints	Kiln dried wood is used for smoking so as to minimise steam production. Limited emissions due to production cycle.	Daily oven clean. 6 monthly flue clean.			

4.4.2 Maintenance Procedures

- Maintenance and servicing of rendering, wastewater storage and reticulation equipment is to be carried out in accordance to with BWM schedules, good practice guides and manufacturer's specifications to ensure that equipment remains in service.

- Maintenance is undertaken in accordance with the work plan which includes the potential for odour emissions resulting from a maintenance or job task, are considered as part of both routine and non-routine work plans.
- A record of all maintenance undertaken will be maintained within BWM.
- A critical parts register, and spare critical parts are also maintained at site to minimise the duration of any replacement period. The critical parts register is maintained within BWM.

4.4.3 Personnel

- A PRP operator is available 24 hours per day, six days per week when the plant is operating to respond to odour complaints and any emission incidents.
- PRP operators are trained to respond to any odour incidents.

4.4.4 Acceptance Criteria for Brink's Offal

- Tegel accepts offal from the Brink's site which is located at 1308 Main South Road, Templeton. The offal must be from the same days production and is generally received between 1-4pm
- A record of all loads, noting their acceptance or rejection, will be retained for the previous 12-month monitoring period.

4.4.5 Changes to the Manufacturing Process that might affect emission of odour

Changes to the site's operations and processes that could impact of the discharges of odour into the air must be assessed as part of the Management of Change process. (National Business Manual)

5 Monitoring

5.1 System Monitoring

Critical performance indicators are managed through SCADA and alarms are in place to notify Engineering of operational issues.

Operator checks are documented in relevant site procedures.

5.2 Site Inspections

EHS complete daily odour checks and records are kept on the shared drive. See Appendix 1.

Any odour issues are reported to the relevant plant operator who is required to instigate appropriate remedial action; confirming the source and then eliminating, isolating or mitigating the cause. The relevant manager is also notified, so that the matter can be escalated, depending on its severity.

6 Odour Complaint Procedures

6.1 Consent Requirements

To be added.

6.2 Complaint Response Procedures

Complaints may be referred by a regulatory authority, a member of the public or a Tegel employee or contractor.

All complaints shall be treated as serious and shall be recorded in the complaints log, and any complaint received will be escalated to the Site Manager and EHS Manager via completion of an EHS Incident Investigation Form ("green form").

The Complaint:

For all complaints the following details shall be recorded in the daily odour log:

(i) time and type of complaint including details of the incident, e.g. duration, location and any effects noted;
(ii) name, address and contact phone number of the complainant (if provided);
(iii) the weather conditions at the time of incident (as described by the complainant)
(iv) the frequency (intermittent or constant) and the duration over which the odour was experienced
(v) confirmation if the complaint has been referred to the Regional Council

Complaint Investigation:

- Record wind direction, wind speed and temperature (recorded at the site meteorological station). (to verify against the wind details provided by the complainant)
- If the location of the complainant is known, visit the location as a priority and as soon as possible to assess and confirm the validity of the odour complaint. Odour complaints will require the investigator to remain and observe at the location for a minimum of ten minutes. Note however the wind conditions at the time of complaint may vary considerably from the wind conditions when visiting the property (for example: calm/still versus moderate wind and direction) therefore a return visit when the condition most resemble those observed by the complaint should be undertaken.
- If it becomes obvious that there may be another source of odour causing the nuisance it is important to verify this. To do this, the person undertaking the investigation should conduct a 360° sweep around the suspected source to eliminate any other possible sources of odour. Record any observations of recognisable odour at other locations surrounding the suspected source, including times of observations at each location.
- After the initial investigation has been completed, contact the person who made the complaint (if possible) to explain any problems found and remedial actions taken.
- If necessary, update any relevant procedures to prevent any recurrence of problems.
- Complete an EHS Incident Investigation Form and update the daily odour log.

6.3 Follow-up Actions

- Advise the Site Manager and EHS Manager.
- Advise staff and contractors where relevant that a complaint has been received and what the findings of the investigations were, and any remedial actions taken.

7 Communication of odour incidents

7.1 To the Complainant

It is important that the findings of an investigation into an odour complaint, and the actions taken to prevent a recurrence, are communicated to the complainant. This is an opportunity to thank them for helping Tegel continuously improve and to apologise for the incident.

7.2 To Staff and Contractors

The Site Manager shall report any odour complaints received, and remedial actions taken, to the relevant operators and contractors. Where the incident has required a change to operational procedure(s), these changes shall be reflected in a revised SOP and in having staff and contractors confirm they understand the change and any aspects of their work in the future.

8 Management Plan Review Procedure

This OMP and all its associated documents will be reviewed at least every year by the EHS Manager and updated, as necessary to reflect changes in operational activities or the site environment.

The review will take into consideration the following:

- Any significant changes to operational activities or methods;
- A review of the adequacy of odour control measures;
- Any additional areas that were not considered in the previous OMP;
- Key changes to roles and responsibilities within the organisation;
- Changes in industry best practice standards;
- Changes in legal or other requirements (social and environmental legal requirements, consent conditions, relevant policies, plans, standards, specifications and guidelines etc);
- Results of inspection and maintenance programmes, logs of incidents, corrective actions, internal or external assessments; and
- The outcome of investigations into discharges of odour causing nuisance effects, or breaching any conditions of consent relating to odour.

The review of the OMP shall be undertaken in accordance with Tegel's document control procedures.

9 List of Relevant Site Documents

The associated documents listed below are part of the site's departmental operational manuals and as such are required to reside and be updated within the company manual structure.

Compliance with the associated documents is the responsibility of the department manager and is considered mandatory in order to comply with this Odour Management Plan.

9.1 South Island Engineering Protein Recovery Manual

00-01 Boiler Operation and Management

05-08 Rendering Odour Management

04-04 Receiving Brinks Offal Procedure

07-01 Rendering Plant Cleaning Procedures

07-06 Rendering Cleaning Schedule

08-03 Design, Maintenance and construction

11-01 Biofilter Operation and Management

9.2 Christchurch Poultry Processing quality Manual

01-14 Livebird Management

9.3 South Island Value Added Manual

04-02 Smoke Generator Operation and Management

9.4 Complaints & Odour Log

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