

Odour Management Review



Dublin Products Ltd

Dunlavin

Co. Wicklow

December 2021

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1 Background

Dublin Products Ltd is a rendering company situated just South West of Dunlavin village approximately 0.75km from the centre of the village in Co. Wicklow. The company was formed in 1973 and has operated on its current site since its inception. The facility provides employment for about 40 people.

The company originally produced its products for use mainly in the manufacture of animal feedstuffs, but in recent years the facility operates more as a service provider to ensure safe treatment and disposal of animal by-products. The process results in the production of meat and bone meal and tallow oil. The NACE code (Rev2) for Dublin Products Ltd is 10.41.

The main environmental aspects associated with the industry of rendering are energy consumption, air emissions and odour. The company is regulated by the Department of Agriculture and also the Environmental Protection Agency for processing Category 1 and 3 animal by products on the Dunlavin site.

This document is focused on the control of odour generated by activities undertaken by Dublin Products.

2 ODOUR MANAGEMENT SUMMARY

2.1 Odour Management Review Objective:

The management at Dublin Products are committed to operating the plant to the highest levels of Environmental protection and compliance. The purpose of this Odour management review is to:

- Identify potential on site odour sources, and existing control measures
- Review the odour control practices on site, identify potential improvements to processes or control measures.
- Set out a clear plan of action to continuously improve odour management on site
- Eliminate odour releases where possible and reduce as far as possible the impact of operations on site on the environment

2.2 Scope

This review covers all aspects of activities associated with the site from raw material transport to site to final product leaving site that have the potential to generate odour that can be controlled by Dublin Products.

3 Description of Site Activities

Dublin Products operate a rendering plant that is licensed and permitted to receive Category 1 and 3 animal by products. Rendering is a cooking and separation process which is used to produce tallow and bone meal from animal by-products. The raw material (Animal By-products or ABP) are cooked at high temperatures to kill bacteria, remove moisture, and sterilize the final product. Separation processes are used to separate the oils from the solids.

Category 1 waste is defined as high risk material such as:

- Very high risk material including the carcasses of animals suspected or confirmed of being infected with BSE
- parts of animals that have been administered certain prohibited substances
- and floor waste where specified risk material (SRM) is generated

Category 3 waste is material which has previously been fit for human consumption, including catering waste, raw meat and fish, hides and skins; parts of slaughtered animals which are fit for human consumption but which are not intended for human consumption for commercial reasons, or due to problems of manufacturing or packaging defects

The Dublin Product site is physically separated into two separate sections (Category 1 and Category 3 sections) with walls and fences dividing the facility. Access to both yards is strictly controlled by secured gates and barriers so as to prevent any crossover of materials.

3.1 Transport

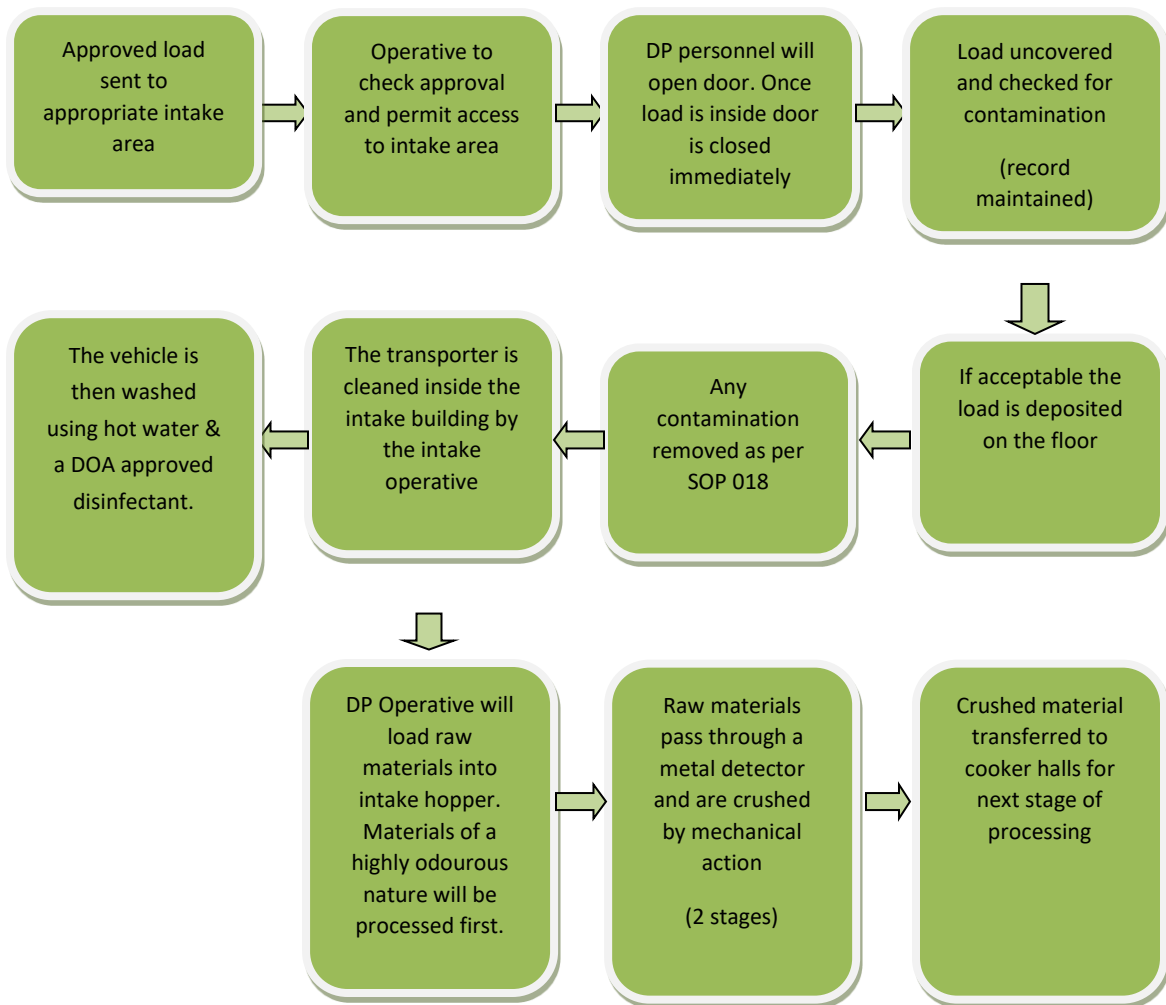
Dublin Products provide a rendering service for slaughter plants, knackeries etc right across Ireland. Owing to the nature of the raw materials the transport of these materials to site is

generally done on tipping trucks or trailer units. It is also the first step in the process that may impact on odour generation therefore Dublin Products have a number of policies in place in regard to hauliers delivering materials to site these include

- Material Acceptance criteria
- Approved routes for incoming deliveries
- Limited intake hours
- Policies in relation to covered loads, cleanliness of vehicles, trailer seals etc

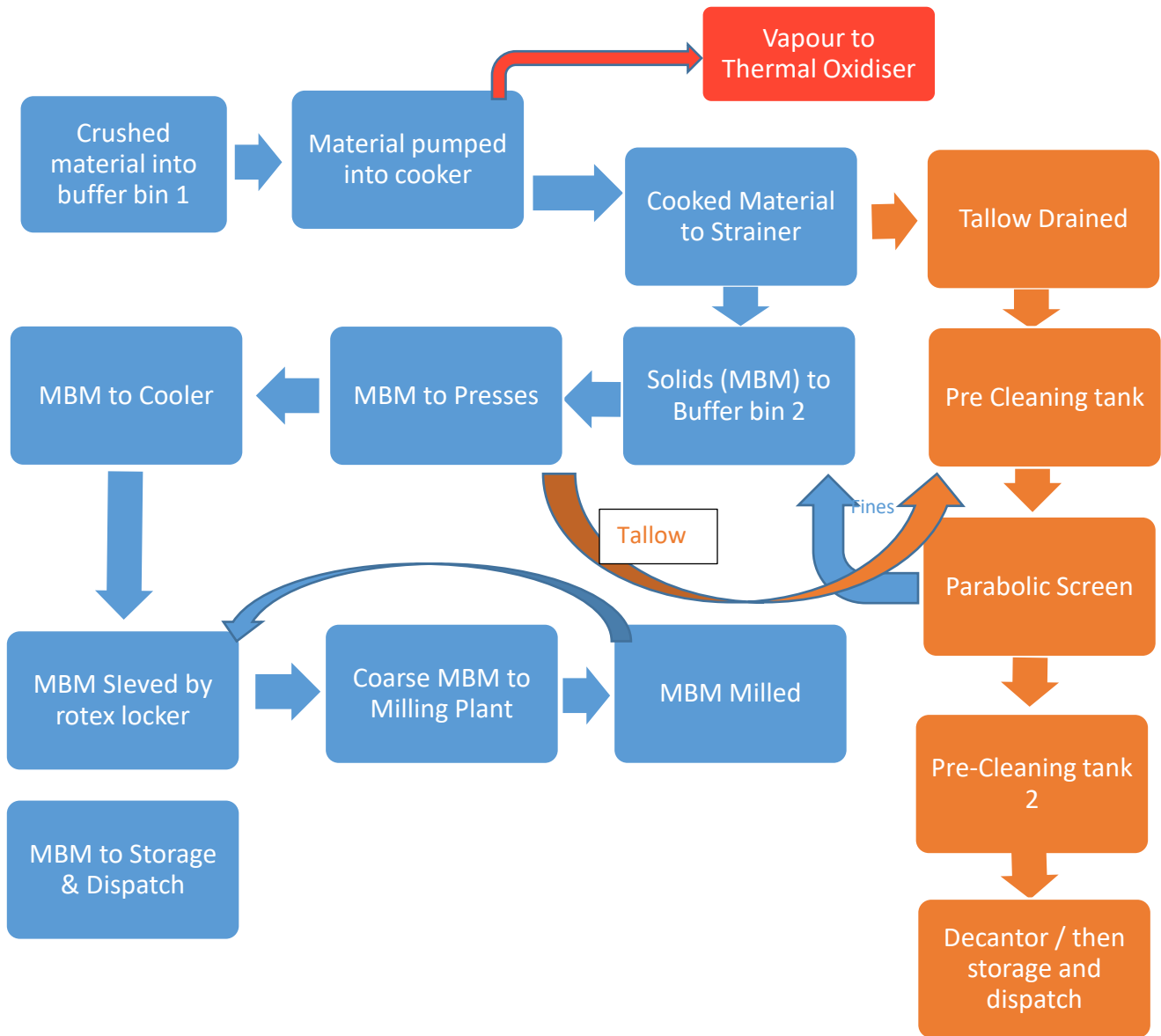
3.2 Raw Material Intake

Both Category one and three intake areas operations take place under the same basic steps:



3.3 Category 1 & 3 Post Intake Flow chart

The flow diagram below illustrates in simple terms the steps taken in both process buildings. Steps in blue refer to solid material, red refers to vapours and orange to tallow. Both processing buildings (Cat 1 and 3) operate under negative pressure, in order to contain any odours generated. The extracted room air is sent to the biofilters for treatment.



4 Odour Receptors and Sources

4.1 Odour receptors in Locality

Table 4.1 Odour receptors				
Receptor type	Location ID	Co-ordinates	Sensitivity	Approximate Distance to Boundary
Residential (Church Tce)	OSL01	53.055968, - 6.706307	4	410m
Town	OSL02	53.057635, - 6.701793	4	760m
National School & adjoining Recreation area	OSL03	53.055120, - 6.698756	4	745m
Residential (Milltown)	OSL04	53.056544, - 6.708664	3	435m



Figure 4.1 Odour Receptors

4.2 Odour Sources Off-Site

Table 4.2 Potential Off Site Odour Sources				
Odour Source	Type of odours	Co-ordinates	Operating hours	Distance to Dublin Products
Local WWTP	Sewerage odours arising from Gaseous odours (H2S, Mercaptans, methane etc)	53.055940, - 6.712577	24	500m
Commercial sources	Cooked chicken	53.057158, - 6.703393	9am to 5pm Mon-Fri	800m
Agricultural Sources	Land spreading of slurry/manure Chemical odours – spraying - fertiliser	Various	Any	0m



Figure 4.2 Other Odour Sources

4.3 Odour Sources On Site

The following table 4.3 is an inventory of the likely odour sources from activities related to Dublin Products

Table 4.3.1 Dublin Products Facility Odour Source Emissions Inventory

Source	Location	Activity/ Material	Emission Type	Likely Odours	Control Measures	Release to Atmosphere	
						Description	Location
Delivery Vehicles	Access Road Yard area and weighbridge	Untreated Category 1 or Category 3 Material	Fugitive	Decaying organic materials.	Measures to control at source Refer to DP Policies	Potentially strong Intermittent Fugitive emissions	Along access road & weighbridge area, near to ground level.
Surface waters	All Outside Yard areas, channels, gulleys	Rain water/ water run-off from washing activity	Fugitive	Greasy/stale	Gulleys/ drains directed to treatment in WWTP	Faint Intermittent Fugitive emissions Possible	Intermittent release from gulleys at ground level
Cat 1 Intake Area	Intake shed	Tipping, storage and handling of Category 1 Material	Fugitive	Decaying organic materials - Blood, Meat/offal odours	Measures to control at source Refer to DP Policies Rapid roller doors, containment within building & treatment from Biofilter 3	Potentially strong Intermittent Fugitive emissions	Doors/ roof etc: Intermittent release
						Continuous variable odour release	Biofilter 3 Outlet Continuous release
Mill	Cat 1 Intake shed	Category 1 Material broken down by mechanical action	Fugitive	Decaying organic materials.-	Material Process Protocols,	Potentially strong Intermittent Fugitive emissions	Doors/ roof etc: Intermittent release

				Blood, Meat/ Offal odours	Containment within building & treatment from Biofilter 3	Continuous variable odour release	Biofilter 3 Outlet close to ground level
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Table 4.3.1 Continued Dublin Products Facility Odour Source Emissions Inventory

Source	Location	Activity/ Material	Emission type	Likely odours	Control Measures	Release to atmosphere	
						Description	Location
Washings	Cat 1 Intake shed	Water from cleaning activity	Fugitive	Decaying organic materials.-Blood, Meat/ offal odours	Regular wash downs of drains and gulleys/ drainage inspections	Intermittent Fugitive emissions	Gulleys, drains etc Odours from WWTP
Screw Conveyor Systems	Between Cat 1 Intake shed & Cat 1 Process Building	Crushed Cat 1 Material transferred to Cooker by means of enclosed screw conveyor	Fugitive emission - Unlikely	Decaying organic materials.-Blood, Meat/ offal odours	Enclosed System	Fugitive emissions through openings in pipe	Will only occur if system has to be accessed due to a blockage or breakdown
Cookers	Cat 1 Process Building (Cooker hall)	Category 1 Material	Cooker off Gases, Fugitive emissions, Spillages	Very strong odours from Cooker gases,	Cooker off gas taken directly to Thermal Oxidiser (TO), Fugitive emissions From leaking seals etc Containment within building & sent to Biofilter 2 for treatment	Continuous variable odour releases	TO Stack outlet Outlet of Biofilter 2
						Potentially strong Intermittent Fugitive emissions	Doors, windows, vents (Building opens)
Press	Cat 1 Process Building (Cooker hall)	Post cooking Category 1 Material – Tallow and Meal	Fugitive	Tallow – oily type odour	Fugitive emissions	Continuous variable odour releases	Outlet of Biofilter 2

		pressed to separate liquid tallow from solid meal		Meal – Earthy meal smell	Containment within building & sent to Biofilter 2 for treatment	Potentially strong Intermittent Fugitive emissions	Doors, windows, vents (Building opens)
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Table 4.3.1 Continued Dublin Products Facility Odour Source Emissions Inventory

Source	Location	Activity/ Material	Emission type	Likely odours	Control Measures	Release to atmosphere	
						Description	Location
Washings	Cat 1 Process Building	Water from cleaning activity	Fugitive	Decaying organic materials.-Blood, Meat/ offal odours	Regular wash downs of drains etc Drainage inspections odour release contained in building -Biofilter 2 for treatment	Intermittent Fugitive emissions	Intermittent release from gulleys Odours from WWTP
						Continuous variable odour releases	Outlet of Biofilter 2
Bonemeal (Final product)	Cat 1 Process Building	Meal is dropped from a conveyor belt into a bunker in an enclosed room	Fugitive emissions	Meal – Earthy meal smell	Containment within building & sent to Biofilter 2 for treatment	Weak to moderate Fugitive emissions	Doors, windows, vents (Building opens)
						Variable odour releases during production	Outlet of Biofilter 2
Steriliser	Steriliser shed	Final sterilisation of Meal	Fugitive emissions	Meal – Earthy meal smell	Containment within building & sent to Biofilter 1 for treatment	Weak to moderate Fugitive emissions	Doors, windows, vents (Building opens)
						Variable odour releases during production	Outlet of Biofilter 1
Tallow Storage	Tank yard	Tallow is pumped into tanks for storage	Fugitive emissions	Tallow – oily type odour	Enclosed tanks	Fugitive emissions	Intermittent release at top of tanks possible

Loading of Final Product	Cat 1 MBM Storage/ Dispatch shed	Loose meal is loaded onto lorries by conveyor system	Fugitive emissions	Meal – Earthy meal smell	None	Fugitive emissions in loading bay	Doors, gaps in building material.
Surface waters	Yards, channels, gulleys	Rain water/ water run-off from washing activity	Fugitive emissions	Greasy/ Stale	Gulleys/ Drains directed to treatment in WWTP	Possible faint releases	Intermittent release from gulleys

Table 4.3.1 Continued Dublin Products Facility Odour Source Emissions Inventory

Source	Location	Activity/ Material	Emission type	Likely odours	Control Measures	Release to atmosphere	
						Description	Location
Empty Containers/ Skips	Yard areas	Empty container storage	Fugitive emissions	Stagnate water Blood, Meat/ Offal odours	Cleaning before storage Covers Removal	Intermittent Fugitive emissions - Weak to moderate	Intermittent release from skips/ Containers
Cat 3 Intake Area	Intake shed	Tipping, storage and handling of Category 3 Material	Fugitive	Decaying organic materials - Blood, Meat/ Offal odours	Measures to control at source Refer to DP Policies Rapid roller doors, containment within building & treatment from Biofilter 1	Strong - moderate Intermittent Fugitive emissions	Doors/ building opens etc
						Continuous variable release of post treatment room air	Biofilter 1 Outlet
Mill Area	Intake shed	Material broken down by mechanical action	Fugitive	Decaying organic materials - Blood, Meat/ Offal odours	Material process Protocols, Containment within building & treatment from Biofilter 1	Intermittent Strong - moderate Fugitive emissions	Doors/ building opens etc
						Continuous variable odour releases	Biofilter 1 Outlet

Washings	Cat 3 Intake shed	Water from cleaning activity	Fugitive	Decaying organic materials - Blood, Meat/ Offal odours	Regular wash downs of drains and gulleys/ Drainage inspections	Intermittent variable fugitive emissions from gulleys, drains etc	Release from gulleys Odours from WWTP
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Table 4.3.1 Continued Dublin Products Facility Odour Source Emissions Inventory

Source	Location	Activity/ Material	Emission type	Likely odours	Control Measures	Release to atmosphere	
						Description	Location
Cookers	Cat 3 Process Building (Cooker hall)	Category 3 Material	Cooker off Gases, Fugitive emissions, Spillages	Very strong odours from Cooker gases	Cooker off gas taken directly to Thermal Oxidiser Fugitive emissions From leaking seals etc Containment within building & sent to Biofilter 1 for treatment	Intermittent Strong - moderate Fugitive emissions	Doors, windows, vents (building opens)
						Continuous variable odour releases during production	Outlet of thermal oxidiser
Conveyor systems	Cat 3 Process Building	Post cooking Category 3 Material - material transfer	Fugitive emissions	Strong Tallow – oily type odour Strong Meal – Earthy meal smell	Containment within building & sent to Biofilter 1 for treatment	Intermittent Fugitive emissions	Doors, windows, vents (building opens)
						Continuous variable odour releases	Outlet of Biofilter 1
Press	Cat 3 Process Building	Post cooking Category 3 Material – Tallow	Fugitive emissions And	Strong Tallow – oily type odour	Fugitive emissions	Moderate to strong Intermittent Fugitive emissions	Doors, windows, vents (building opens)

		and Meal pressed to separate liquid tallow from solid meal	Emission to atmosphere	Strong Meal – Earthy meal smell	Containment within building sent to Thermal Oxidiser for treatment	Continuous variable odour releases during production	Outlet of Biofilter 1 Outlet of TO
Washings	Cat 3 Process Building	Water from cleaning activity (Grease/ Organic Residues etc)	Fugitive	Decaying organic materials - Blood, Meat/ Offal odours	Regular wash downs of drains and gulleys/ Drainage inspections odour release contained in building to Biofilter 1 for treatment	Intermittent variable fugitive emissions from gulleys, drains etc	Release from gulleys WWTP Outlet of Biofilter 1

Table 4.3.1 Continued Dublin Products Facility Odour Source Emissions Inventory

Source	Location	Activity/ Material	Emission type	Likely odours	Control Measures	Release to atmosphere	
						Description	Location
Bonemeal (Final products)	Cat 3 Process Building	Meal is dropped from a conveyor belt into a bunker in an enclosed room	Fugitive emissions	Meal – Earthy meal smell	Containment within building & sent to Biofilter 1 for treatment	Faint to moderate fugitive emissions	Doors, windows, vents (building opens)
						Continuous variable odour releases	Outlet of Biofilter 1
Tallow Storage	Tallow Storage Tanks	Tallow is pumped into tanks for storage	Fugitive emissions	Tallow – oily type odour	Enclosed tanks	Intermittent Fugitive emissions	Intermittent release at top of tanks through vents or leaks
Loading of Final Product	Cat 3 Process Building	Loose meal is loaded onto lorries by loading shovel	Fugitive emissions	Meal – Earthy meal smell	None	Fugitive emissions from material handling	Container loading in Yard outside Cat 3 Process Building

Thermal Oxidiser	TO Stack	Steam production and treatment of off-gases	Emission to atmosphere	Gassy/ Tallow odours	Regular preventative maintenance Plant shutdown if failure	Under correct operation odour emissions from the TO should be minimal at the stack outlet	TO stack outlet
Boilers	Boiler House	Steam production	Emission to atmosphere	Gassy/ Tallow odours	Regular preventative maintenance	Minimal release of odour at stack outlets	Boiler stacks
Biofilter 1	Biofilter 1	Treatment of Room air from	Emission to atmosphere	Earthy musty odours	Planned Biofilter testing and maintenance	Continuous variable release of post treatment room air from various factory locations	Open biofilter bed
Biofilter 2	Biofilter 2	Treatment of Room air from	Emission to atmosphere	Earthy musty odours	Planned Biofilter testing and maintenance	Continuous variable release of post treatment room air from various factory locations	Open biofilter bed

Table 4.3.1 Continued Dublin Products Facility Odour Source Emissions Inventory

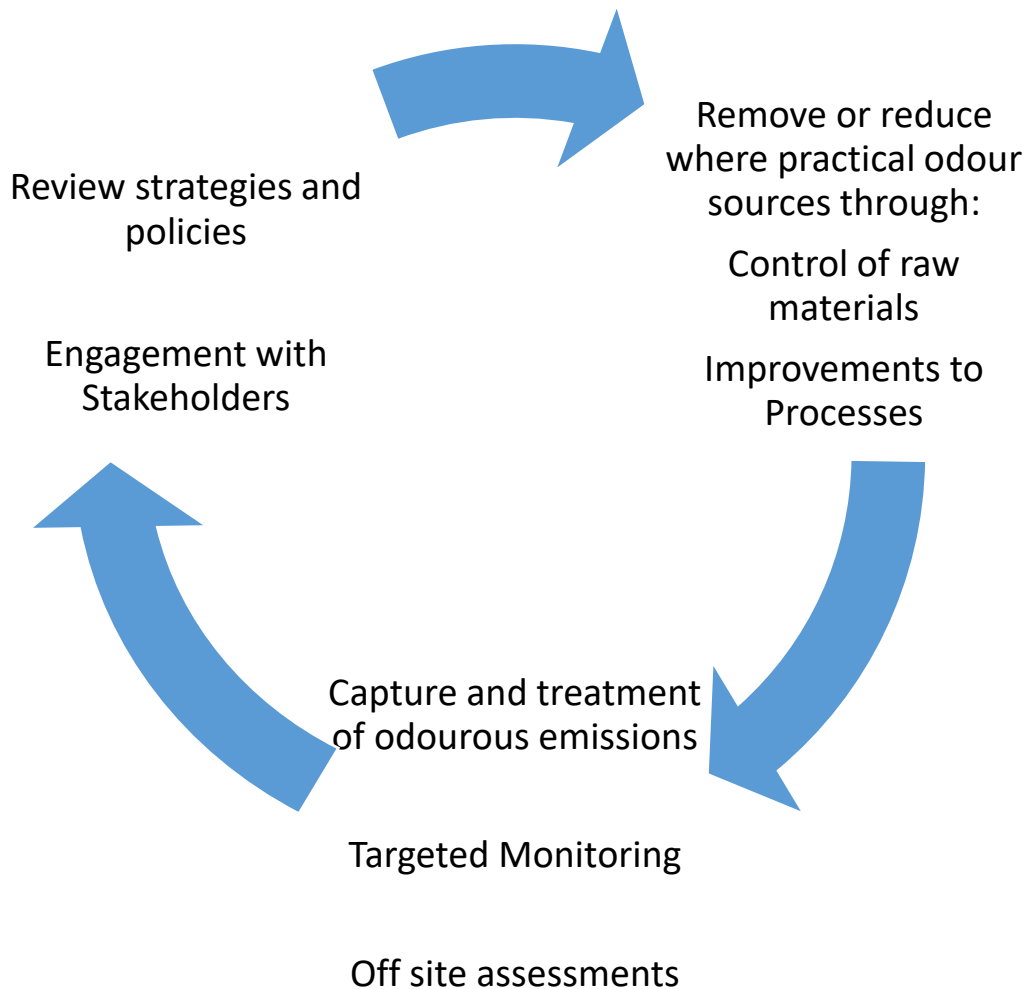
Source	Location	Activity/ Material	Emission type	Likely odours	Control Measures	Release to atmosphere	
						Description	Location
Biofilter 3	Biofilter 3	Treatment of Room air from	Emission to atmosphere	Earthy musty odours	Planned Biofilter testing and maintenance	Continuous variable release of post treatment room air from various factory locations	Open biofilter bed
WWTP Yard	WWTP	Treatment of waste waters generated on-site	Fugitive emissions	Stagnant water / Sludge like odours	Regular cleaning of yards	Fugitive emissions from spoil on yard surface	WWTP
Intake Sump	WWTP	Collection point for waste waters generated on site	Fugitive emissions	Waste water odours	Frequent pumping & removal of fat and grease build up	Fugitive emission from water surface	WWTP

DAF Unit	WWTP	Dissolved air floatation of effluent	Fugitive emissions	Waste water odours	High level alarms	Fugitive emission	WWTP
Balance tank	WWTP	Treatment of waste waters generated on site	Fugitive emissions	Waste water odours	High level alarm	Fugitive emission from water surface	WWTP
Aerator 1	WWTP	Treatment of waste waters generated on site	Fugitive emissions	Waste water odours	Aeration High level alarms	Fugitive emission	WWTP
Aerator 2	WWTP	Treatment of waste waters generated on site	Fugitive emissions	Waste water odours	Aeration High level alarms	Fugitive emission	WWTP
Sludge Press Shed	WWTP	Removal of solids from Waste water	Fugitive emissions	Strong sludge odours	Partially enclosed press	Emission generated by mechanical pressing of sludge material from WWTP	Sludge press building

5 Odour Control

Owing to the nature of the raw materials (Animal by-products) processed by Dublin Products at the Dunlavin facility it is recognised that odour control will always be a key concern and needs to be carefully managed in order to reduce any potential impacts of site operations.

The following flow diagram illustrates the steps taken by D.P to continuously improve Odour control.



5.1.1 Transport

Dublin Products accept materials from all across the country of Ireland, and recognize that there is a potential for fugitive emissions from vehicles transporting materials to site. Management and staff of Dublin Products are committed to working closely with customers, hauliers and local residents to make continuous improves to policies and procedures in place to reduce odour emissions when possible, as part of this a number of measures have been identified and implemented to reduce the potential impact. These are detailed in Table 5.1.1 and the corrective actions to be taken in the event of a failure of a control measure are detailed in Table 5.1.2.

5.1.2 Category 1 & 3 Operations

Incoming materials to the Category 1 and 3 operations have the potential to be highly odourous therefore Dublin Products have implemented and maintain a number of policies and procedures for all operations that are undertaken in these areas. These are summarised below and in tables 5.1.3, 5.1.5, 5.1.7, 5.1.9 and 5.1.11. The corrective actions to be taken in the event of a failure of a control measure are detailed in Tables 5.1.4, 5.1.6, 5.1.8, 5.1.10 and 5.1.12.

Building integrity due to the nature of the materials being handled at Dublin Products, it is important that odours are contained within the building to prevent the dispersion of odour. In order to prevent untreated odour from escaping the process buildings. Dublin Products operate the process areas under negative pressure. Room air is extracted at roof level and ducted to Biofilters for treatment. Therefore in order to conserve energy and prevent fugitive emissions the building structure should remain in good condition – No holes, open cracks/gaps broken windows doors etc. This should be checked once per month at a minimum and after any reported strikes (such as a loader or vehicle hitting the fabric of the building).

Building materials when used should be selected based on robustness, ease of cleaning and ability to be sealed to allow for odour containment.

Close door Policy - All doors (pedestrian and vehicular access doors) are to be closed tightly on entry or exit from the building. Doors shall be open for as short a time as possible. Loading or unloading of materials is not permitted when a door is open.

Raw Material It is the policy of Dublin Products to give material of a highly odourous nature priority for processing. Thereafter materials are processed as they arrive on site and the following guidelines are followed:

1. No raw materials are left unprocessed for more than 24hours.
2. Dublin Products will endeavor to ensure raw materials are as far as possible not left overnight unprocessed.
3. Raw material will not be stock piled on site.

Furthermore Dublin Products will endeavor to work closely with all sources of incoming raw materials to ensure materials are delivered as fresh as possible, in well sealed and covered transporters. Deliveries are planned and phased in such a way to ensure that intake volume does not exceed processing capacity.

Wash Down/ Cleaning The following areas of the facility are washed down using power hoses and in accordance with HACCP SOP 005 in order to prevent build-up of putrescible materials.

1. Raw Materials intake floor: Daily and as required in order to keep the floor in a reasonable condition.
2. Raw intake walls and mechanical equipment once per day.
3. Cooker halls - Daily and as required in order to keep the floor in a reasonable condition.
4. Drains in cooker hall at the end of the day or as required to keep drains free flowing.

Also refer to HACCP Procedures (Cleaning and Hygiene SOP no.05 for Category 1 and 3).

Training All staff at DP are trained in accordance with DP policies and procedures. The importance of odour control at the facility is clearly communicated to all staff members through staff meetings, signage and toolbox talks. Staff are encouraged to make any recommendations on improvements they believe will improve the procedures or policies on site including those related to odour control, containment and treatment.

5.1.3 WWTP

Dublin Products operate an on-site waste water treatment plant to handle foul water arising from incoming materials, washing operations and processing of materials etc. Having regard for the potential of the WWTP to generate odours the plant is operated under strict policies and procedures within Dublin Products. The control measures and corrective actions are detailed in table 5.1.13 and 5.1.14.

The existing waste water treatment plant at Dublin Products comprises of the following unit processes;

- Raw Effluent Collection
- Dissolved Air Flotation
- Raw Effluent Balancing
- Activated Sludge
- Final Clarification
- Sludge Thickening, De-sludging and De-watering (Belt Press)

High level alarms – To reduce the risk of spills these alarms are fitted on the aerators, balance tanks and the DAF sump. When the level of the water exceeds a certain level the alarm will sound. It alerts the Environmental Operator and the Production Operators to go and check the tanks. The operators can adjust the amount of water entering the system. The high level alarms are checked weekly. In the event of a failure during inspection maintenance will be carried out to repair or replace the high level alarm. Details are recorded on the weekly record (Ref EMR 018 High level alarm weekly inspection).

Failure of the adequate aeration - In the event of a power failure the aerator will cease to operate. In this case the valves will be closed off manually to prevent water pumping out. The water pumping in will have ceased as a result of the power failure shutting down the associated pumps. Spare parts are stored on site and available if required. If an aerator is out for more than 24 hours then a generator will be hired (Aggreko) as a backup until repairs are completed. This will eliminate the risk of odours being generated on startup if it is left to stand for more than 24 hours.

Cleaning & Hygiene - The WWTP is inspected for cleanliness daily and washed down as required. Drains are checked and kept clear. The DAF is cleaned weekly (walls & floor), then once every fortnight a dedicated wash down is carried out using a power hose.

Table 5.1.1 – Transport Control Measures

Activity	Control Measure	Responsible persons	Performance Checks	Frequency of Checks	Checks by	Records
Transport	Delivery Plan	Management	Input v Process Capacity	Ongoing	Intake Operator / Management	Supplier Contracts
	DP Policy on incoming material DP to be informed of highly odourous loads before they leave the customer site to ensure short processing time	Clients/ Hauliers Management	Sniff test of incoming loads/ Visual inspection of incoming loads	Load by load	Weighbridge operator Intake area operative	Correspondence Records Intake Inspection record No.004
	Only licensed and approved hauliers used	Management	Weighbridge operator to check haulier details	Ongoing	Weighbridge operator	Intake Inspection record No.004
	Designated routes used to access and leave site	Haulage Operator	Spot checks on approach routes to site	Ongoing	Site Management	Daily Plant Checklist
	Vehicles used are in good condition	Haulage Operator	Visual checks at Weighbridge	All incoming/ outgoing vehicles	Weighbridge operator	Confirmation of truck wash & cover Record No. 005
	Covers and or Seals on Vehicles in Good condition	Weighbridge operator	Visual checks at Weighbridge	All incoming/ outgoing vehicles	Weighbridge operator	Confirmation of truck wash & cover Record No. 005
	Washing down of delivery vehicles	Intake area Operator & Driver	Weighbridge operator to check exiting vehicles are cleaned down	All outgoing vehicles	Weighbridge operator	Confirmation of truck wash & cover Record No. 005

Table 5.1.2 – Transport Corrective Actions in Event of Failures

Control Measure	Failure	Direct Action	Possible Outcomes.		
<p>DP Policy on incoming material</p> <p>DP to be informed of highly odourous loads before they leave the customer site to ensure availability of short processing time</p>	Highly odourous load delivered to DP	<ul style="list-style-type: none"> - Haulier directed to appropriate intake area to contain odour (not to unload), management informed of failure. - Haulier advised as to DP incoming material Policy - Management to contact Site of Origin 	<p>Haulier may receive an initial warning</p> <p>Site of origin may receive an initial warning</p>	If appropriate management may allow unloading and have materials processed immediately	Management may reject load and return to site of origin
Only licensed and Approved hauliers used	Unapproved Haulier arrives at site	Load rejected if commercial documents not presented	Site of Origin informed and load returned	On site Dept. Of Agriculture official to investigate	-
Designated routes used to access and leave site	Haulier using non designated routes	Management informed and investigation of cause	Haulier advised as to DP transport Policy and written warning issued	Haulier removed from AVL	-
Vehicles used are in good condition	Vehicle in poor condition	Management informed and investigation carried out	Haulier advised as to DP transport Policy and written warning issued	Haulier removed from AVL	-
Covers and or Seals on Vehicles in Good condition	Covers and or Seals in poor Condition	Management informed and investigation carried out	Haulier advised as to DP transport Policy and written warning issued	Haulier removed from AVL	-
<p>Washing down of delivery vehicles</p> <p>(Ref HACCP SOP No.005)</p>	Vehicle leaves intake area uncleaned	Vehicle sent back to intake area immediately	Intake Operator to fully wash down vehicle as per HACCP SOP 005	Driver to further wash vehicle at truck wash	Intake Operator and Driver to be instructed as to DP Policies

Table 5.1.3 – Category 1 &3 Intake Operational Control Measures

Activity/Area	Control Measure	Responsible persons	Performance Checks	Frequency of Checks	Checks by	Records
Intake Area	Building integrity	DP Staff/ Maintenance/ Management	Daily Check Building integrity Inspection	Daily Annual	Production Manager EHS	Daily Plant Checklist Building Integrity Report
	Close Door Policy	DP Staff	Spot checks by management/ Supervisor, EHS etc	Daily	Production Manager/ EHS/ DP Staff	Daily Plant checklist
	Room air is continuously extracted for treatment using Negative Pressure	DP Staff/ Maintenance/ Management	Daily visual inspection of Inlet flow Monthly flow checks on ducting	Daily Monthly	Production Manager EHS	Daily Plant Checklist IPPC license returns
	Raw Material Management & handling	Intake Operator	Daily Through put End of shift checks	Daily	Production Manager Intake Operator	Weekly stock sheet Intake Inspection Record
	Equipment Maintenance	Intake Operator/ Maintenance	Loading shovel (Oil/water/etc) Mill (Oil/Grease etc) As per Maintenance Schedule	Daily As per Maintenance Schedule	Intake Operator Maintenance Personnel	Intake Inspection Record Maintenance Records
	Cleaning	Intake Operator	Daily Check	Daily	Intake Operator	Intake Inspection Record

Table 5.1.4 – Intake Area Corrective Actions in event of Failures

Control Measure	Failure	Direct Action	Possible Outcomes.		
Building integrity	Breakdown of Structural Integrity (hole in roof sheeting, broken door etc)	Management/EHS and Maintenance informed immediately Spare doors sourced from Stores	An assessment is made of the potential impact & appropriate actions agreed including timelines and responsible persons	Immediate repairs are undertaken if possible	Operations are suspended until such time as repairs can be completed
Close Door Policy	Door left opened	Close door immediately- inform area supervisor	Staff/Contractor briefing on Door Policy	If Mechanical or Structural cause (damaged roller door/self close mechanism. Immediate repairs are undertaken if possible	Management informed and appropriate actions taken
Room air is continuously extracted for treatment using Negative Pressure	Loss of Extraction/ Insufficient extraction	Management/EHS and Maintenance informed immediately	An assessment is made of the potential impact & appropriate actions agreed including timelines and responsible persons	Immediate repairs are undertaken if possible	Operations are suspended until such time as repairs can be completed
Raw Material Management	Material age exceeds 24hours Material processing is delayed Intake rate is exceeding processing capacity	Management/EHS and informed immediately Management/EHS and Maintenance informed immediately Management/EHS and informed immediately	Contact customers and suspend intake of materials until back log is cleared Material to be prioritised on odour potential and age	Divert incoming loads to other licenced facility if possible until back log is cleared	Investigate root cause of delay/stoppage etc – report finding and implement corrective actions arising

Table 5.1.4 continued..– Intake Area Corrective Actions in event of Failures					
Control Measure	Failure	Direct Action	Possible Outcomes.		
Equipment Maintenance	Breakdown of Equipment	Management/EHS and Maintenance informed immediately	An assessment is made of the potential impact & appropriate actions agreed including timelines and responsible persons	Immediate repairs are undertaken if possible Replacement parts spares etc ordered	Divert or Suspend incoming loads to other licensed facility if appropriate (depending on potential length of stoppage etc)
Wash Down/Cleaning	Inadequate cleaning Build up of putrescible materials in corners/floor on equipment	Area to be cleaned as per HAACP SOP 005	Management/EHS/Area Supervisor informed	Staff working in area briefed/re-trained on SOP 005	Operative may receive an initial warning or appropriate disciplinary action

Table 5.1.5 – Category 1 & 3 Cooker Hall Operational Control Measures

Activity/Area	Control Measure	Responsible persons	Performance Checks	Frequency of Checks	Checks by	Records
<p>Cooking Hall – Raw material is cooked at high temperature in cookers</p> <p>Post cooking Oil (Tallow) and solids (meal) separated by mechanical strainers and presses</p> <p>Solids are cooled and sieved larger fraction is milled and returned to sieve</p> <p>Tallow is strained and pumped to storage</p>	Building integrity	DP Staff/ Maintenance/ Management	Building Integrity Inspection	Daily Annual	Production Manager/ EHS	Daily Plant Checklist Building Integrity Report
	Close Door Policy	DP Staff	Spot checks by Management/ Supervisor/ EHS etc	Daily	Production Manager/ EHS/ Supervisors	Daily Plant Checklist Daily Odour Assessment Record
	Room air is continuously extracted for treatment using Negative Pressure to biofilters	DP Staff/ Maintenance/ Management	Daily visual inspection of Inlet flow Monthly flow checks on ducting	Daily Monthly	Production Manager EHS	Daily Plant Checklist IPPC license Returns
	Extraction of process off gases to thermal oxidiser	Maintenance Process Operator	Vacuum & Pressure gauges on system	Daily	Maintenance/ EHS/ Process Operator	TO Log
	Equipment Maintenance	Maintenance Process Operator	Equipment gauges As per Maintenance Schedule	Daily As per Maintenance Schedule	Intake Operator Maintenance Personnel	Daily checks Maintenance Records
	Cleaning	Process Operator	Daily Log Spot Checks	Daily Random	Process Supervisor EHS	Cleaning Records
	Staff Training (Policies and Procedures)	EHS/ Management	Training records	As per training plan & schedule	EHS	Training Records

Table 5.1.6 – Category 1 & 3 Cooker Hall Corrective Actions in event of Failures

Control Measure	Failure	Direct Action	Possible Outcomes.		
Building integrity	Breakdown of Structural Integrity (hole in roof sheeting broken door etc)	Management/EHS and Maintenance informed immediately	An assessment is made of the potential impact & appropriate actions agreed including timelines and responsible persons	Immediate repairs are undertaken if possible	Operations are suspended until such time as repairs can be completed
Close Door Policy	Door left opened	Close door immediately- inform area supervisor	Staff/Contractor briefing on Door Policy (toolbox talk)	If Mechanical or Structural cause (damaged roller door/self close mechanism) Immediate repairs are undertaken if possible	Management informed and appropriate actions taken
Room air is continuously extracted for treatment using Negative Pressure	Loss of Extraction/insufficient extraction	Management/EHS and Maintenance informed immediately	An assessment is made of the potential impact & appropriate actions agreed including timelines and responsible persons	Immediate repairs are undertaken if possible	Operations are suspended until such time as repairs can be completed
Extraction of process off gases to thermal oxidiser	TO Failure Ducting failure	Management/EHS and Maintenance informed immediately Plant shutdown	Operations are suspended until such time as repairs can be completed – Residual gases to be diverted to biofilters if possible	EHS to inform EPA of incident	Divert or Suspend incoming loads to other licensed facility if appropriate until TO is fully operational
Equipment Maintenance	Breakdown of Equipment	Management/EHS and Maintenance informed immediately	An assessment is made of the potential impact & appropriate actions agreed including timelines and responsible persons	Immediate repairs are undertaken if possible Replacement parts spares etc ordered	Divert or Suspend incoming loads to other licensed facility if appropriate (depending on potential length of stoppage etc)

Table 5.1.6 continued – Category 1 & 3 Cooker Hall Corrective Actions in event of Failures

Control Measure	Control Measure	Control Measure	Control Measure		
Wash Down/Cleaning	Inadequate cleaning Build up of putrescible materials in corners/floor/drains or on equipment	Area to be cleaned as per HAACP SOP 005	Management/EHS/Area Supervisor informed	Staff working in area briefed/re-trained on SOP 005	Operative may receive an initial warning or appropriate disciplinary action
Staff Training (policies and procedures)	Inadequate training	Area supervisor and management informed	Duties reassigned to trained and competent staff	Appropriate training is given and records updated	-

Table 5.1.7 – Category 1 Meal Steriliser Operational Control Measures

Activity/Area	Control Measure	Responsible persons	Performance Checks	Frequency of Checks	Checks by	Records
Steriliser building – MBM is treated under High temperature to ensure sterilisation	Building integrity	DP Staff/ Maintenance/ Management	Building integrity Inspection	Daily Annual	EHS	Daily Plant Checklist Building Integrity Report
	Close Door Policy	DP Staff	Spot checks by Management/ Supervisor/ EHS etc	Daily	EHS/ Management/ Supervisors	Daily Plant Checklist Odour Assessment
	Room air is continuously extracted for treatment using Negative Pressure to biofilters	DP Staff/ Maintenance/ Management	Daily visual inspection of Inlet flow Monthly flow checks on ducting	Daily Monthly	Production Manager EHS	Daily Plant Checklist IPPC license Returns
	Equipment Maintenance	Process Operators Maintenance	Equipment gauges As per Maintenance Schedule	Daily As per Maintenance Schedule	Process Operators Maintenance Personnel	Operational Control Log Maintenance Records
	Cleaning	Process Operators	Cleaning Checks	Daily	Process Operators EHS	Cleaning Records
	Staff Training (policies and procedures)	EHS/ Management	Training records	As per training schedule	EHS	Training records

Table 5.1.8 – Category 1 Meal Steriliser Corrective Actions in event of Failures

Control Measure	Failure	Direct Action	Possible Outcomes.		
Building integrity	Breakdown of Structural Integrity (hole in roof, sheeting broken, door damage etc)	Management/ EHS & Maintenance informed immediately	An assessment is made of the potential impact & appropriate actions agreed including timelines and responsible persons	Immediate repairs are undertaken if possible	Operations are suspended until such time as repairs can be completed
Close Door Policy	Door left opened	Close door immediately - Inform Process Supervisor	Staff/ Contractor briefing on Door Policy (toolbox talk)	If Mechanical or Structural issue (damaged roller door/self close mechanism) immediate repairs are undertaken where possible.	Management informed and appropriate actions taken
Room air is continuously extracted for treatment using Negative Pressure	Loss of extraction/ Insufficient extraction	Management/ EHS and Maintenance informed immediately	An assessment is made of the potential impact & appropriate actions agreed including timelines and responsible persons	Immediate repairs are undertaken if possible	Operations are suspended until such time as repairs can be completed
Equipment Maintenance	Breakdown of Equipment	Management/ EHS and Maintenance informed immediately	An assessment is made of the potential impact & appropriate actions agreed including timelines and responsible persons	Immediate repairs are undertaken where possible Replacement parts spares etc ordered	Divert or Suspend incoming loads to other licensed facility if appropriate (depending on potential length of stoppage etc)
Cleaning	Inadequate cleaning Build up of materials in corners/ on floor or on equipment	Area to be cleaned as per HAACP SOP 005	Management/ EHS/ Process Supervisor informed	Staff working in area re-trained on SOP 005	Process Operators may receive an initial warning or appropriate disciplinary action
Staff Training (policies and procedures)	Inadequate training	Area supervisor and management informed	Duties reassigned to trained and competent staff	Appropriate training is given and records updated	

Table 5.1.9 – Category 1 & 3 MBM Storage/ Dispatch Operational Control Measures

Activity/Area	Control Measure	Responsible persons	Performance Checks	Frequency of Checks	Checks by	Records
MBM Storage dispatch	MBM Kept dry	Process Operator Maintenance	Structure integrity	Daily Checks Visual inspection of materials	Production Manager Process Operator	Daily Plant Checklist
	Material loading equipment maintenance	Process Operator Maintenance	As per Maintenance Schedule	Daily As per Maintenance Schedule	Intake operative Maintenance Personnel	Daily checks Maintenance Records
	Loaded materials properly covered/ sealed	Process Operator On-site DOA Staff	Inspection of outgoing loads	Each outgoing load	Weighbridge operator DOA Staff	Commercial Documents
	Cleaning	Process Operator	Spot Checks	Random	Production Manager EHS	Cleaning Records
	Staff Training (policies and procedures)	EHS/ Management	Training records	As per training schedule	EHS	Training Records

Table 5.1.10 – Category 1 & 3 MBM Storage/ Dispatch Corrective Actions in event of Failures

Control Measure	Failure	Direct Action	Possible Outcomes.		
MBM Kept dry	Breakdown of Structural Integrity (hole in roof, sheeting damage, door broken etc)	Management/ EHS and Maintenance informed immediately	An assessment is made of the potential impact & appropriate actions agreed including timelines and responsible persons	Immediate repairs are undertaken if possible	Wet material is returned to Intake area for re-processing
Material loading Equipment Maintenance	Breakdown of Equipment	Management/ EHS and Maintenance informed immediately	An assessment is made of the potential impact & appropriate actions agreed including timelines and responsible persons	Immediate repairs are undertaken if possible Replacement parts spares etc ordered Replacement Loader sourced	Divert or Suspend incoming loads to other licensed facility if appropriate (depending on potential length of stoppage etc)
Loaded materials properly covered/ sealed	Loads not covered/ sealed	Haulier informed Management/ EHS informed	Haulier is diverted back to dispatch to re-cover seal load	Not allowed leave site until load is satisfactorily covered	-
Cleaning	Inadequate cleaning Build up of materials in corners/ on floor or on equipment	Area to be cleaned as per HAACP SOP 005	Management/EHS/Area Supervisor informed	Staff working in area re-trained on SOP 005	Operative may receive an initial warning or appropriate disciplinary action
Staff Training (policies and procedures)	Inadequate training	Process supervisor and management informed	Duties reassigned to trained and competent staff	Appropriate training is given and records updated	-

Table 5.1.11 – Category 1 & 3 EMPTY SKIPS/ CONTAINERS/ VESSELS Operational Control Measures

Activity/Area	Control Measure	Responsible persons	Performance Checks	Frequency of Checks	Checks by	Records
Empty Containers/ Skips/ Vessels	Cleaning	Process Operator or Haulier	Spot Checks	Daily	Production Manager EHS	Confirmation of Truck wash & cover
	Empty Containers/ Skips/ Vessels should be covered or overturned to prevent ingress of water	Process Operator or Haulier	Spot Checks	Daily	Production Manager EHS	Confirmation of Truck wash & cover

Table 5.1.12 – Category 1 & 3 EMPTY SKIPS/ CONTAINERS/ VESSELS Corrective Actions in event of Failures

Control Measure	Failure	Direct Action	Possible Outcomes.		
Cleaning	Containers/ Skips/ Vessels left outdoor without being fully cleaned down	Production Manager & EHS informed immediately	Containers/ Skips/ Vessels brought immediately to appropriate wash bay for cleaning	Toolbox talk is given to responsible employees/ contractors working in area on policy and procedure	-
Empty Containers/ Skips/ Vessels should be covered or overturned to prevent ingress of water	Containers or vessels are left open allowing rainwater to enter – Stagnant water odours	Production Manager & EHS informed immediately	Any residual water is removed and offending item is covered immediately	Item is removed from site	Toolbox talk is given to responsible employees/ contractors working in area on policy and procedure

Table 5.1.13 – WWTP Operational Control Measures

Activity/Area	Control Measure	Responsible persons	Performance Checks	Frequency of Checks	Checks by	Records
Treatment of foul water	Wash Down/ Cleaning	WWTP operative Yard Supervisor	Spot Checks	Daily/ Weekly/ Monthly	EHS	Cleaning Record
	Frequent pumping of Collection sump to minimise fat and grease build up	Environmental operative	Spot Checks	Daily	EHS	Daily Plant Checklist
	No condensate from Process goes to WWTP under normal conditions	Process Operators/ Management	Spot Checks	Daily	EHS	Cleaning Record
	Aeration of Waste water	WWTP operative	Spot Checks High level Alarms	Daily	EHS	IPPC Licence returns
	Chemical Dosing	WWTP operative	Spot Checks Lab analysis and checks	Daily/ Weekly	EHS/ Lab Technician	-
	Out of hours supervision	Environmental operative Lab Technician Production manager	Daily out of hours	Daily	Area Supervisor or EHS	Area Logbook
	High level alarms	Environmental operative Lab Technician	As required on hearing alarms	For every alarm	Environmental operative Lab Technician	Area Logbook
	Balance tank	WWTP operative	Spot Checks	Daily visual	EHS	Daily plant checklist
	DAF Unit	WWTP operative	Spot Checks	Daily visual	EHS	Daily plant checklist
	Belt Press	WWTP operative	Spot Checks	Daily visual	EHS	Daily plant checklist

Table 5.1.14 – WWTP Corrective Actions in event of Failures

Control Measure	Failure	Direct Action	Possible Outcomes.		
Cleaning	Inadequate cleaning of WWTP yard, sumps etc	Area to be cleaned as per schedule set out	Immediate cleaning is undertaken	Re-training of appropriate personnel	Management, EHS and supervisor informed
Frequent pumping of collection sump to minimise fat and grease build up	Excessive buildup of Grease/ Fat in collection sump	Environmental operative Informed	Fat and grease removed and returned to raw material intake area for processing	Investigation into possible cause	Re-training of appropriate personnel
No condensate from Process goes to WWTP under normal conditions	TO breakdown	Processing ceases vapours in the system directed to air cooled condenser which drains directly to Balance Tanks	EHS and Management informed	TO repairs are undertaken before processing is re-started	-
Aeration of Waste water	Aeration unit failure / Power failure	Manually close off valves to prevent water pumping out	Mangement, EHS and Maintenance informed Investigation into possible causes	Repairs or necessary replacement parts are put in place	In event of power failure exceeding 24hours a backup generator will be hired (Aggreko) until power is restored
Chemical Dosing	Incorrect dosing with chemicals	Correction of chemical dosing based on lab analysis	EHS and Management informed	Re-training of appropriate personnel	Chemical labeling inspected
Out of hours supervision	Checks not completed or a failure not captured	EHS and Management informed Investigation into possible causes	Any required repairs are completed	Review of policies and procedures & or Re-training of appropriate personnel	Disciplinary action if required
High level alarms	Alarms not sounds	EHS and Maintenance informed Investigation into possible causes	Repairs or necessary replacement parts are put in place	Review of policies and procedures & or Re-training of appropriate personnel	Disciplinary action if required
Balance tank	Integrity Failure	Tank integrity inspection	EHS, Maintenance and Management informed	Tank repaired or replaced as necessary	-

Table 5.1.14 continued.. – WWTP Corrective Actions in event of Failures

Control Measure	Failure	Direct Action	Possible Outcomes.		
DAF Unit	Mechanical failure	Maintenance assess required repairs immediately	EHS, Maintenance and Management informed	Source spare parts as required	Repairs or necessary replacement parts are put in place
Belt Press	Mechanical failure	Maintenance assess required repairs immediately	EHS, Maintenance and Management informed	Source spare parts as required	Repairs or necessary replacement parts are put in place

6 Odour Treatment

Dublin Products currently utilise two odour abatement strategies on site to treat odours. These are thermal treatment of odourous off-gases by Thermal Oxidiser and biological treatment using woodchip biofilters.

6.1.1 Thermal Oxidiser

The thermal oxidizer was installed to treat all cooker vapours from the processing areas by oxidising the effluent and extracted air, at temperatures of between 850oC and 1100oC. Volatile pollutants are destroyed thereby leaving the final exhaust stream free from odourous fumes. The air extracted (containing the non-condensable gases) from the process areas is also used for combustion air, which allows for heat recovery thus saving on energy. Combustion air is at a flow rate of 20,885kg/ h.

Thermal oxidation of all gases arising from the cooking processes will contribute to a significant reduction in the volume of wastewater arising for treatment on the site. This reduction in wastewater volume will arise because instead of condensing the gases from the cooking process they will be conveyed, in a gaseous form, directly from the cookers to the thermal oxidiser for treatment and discharge to atmosphere through the stack.

General Operation

1. Odorous gases are delivered directly to the burner chamber of the thermal oxidiser. Combustion air, which is essential for the oxidation process, will be drawn from inside the process building.
2. The combustion air will be preheated, using waste heat from the thermal oxidation process, before being delivered to the oxidation chamber.
3. The burner in the thermal oxidiser is similar to that of a burner in a conventional steam boiler and is fired either using fuel oil or tallow oil.
4. The burner is automatically controlled to ensure that the temperature in the oxidation chamber is maintained at the required value.
5. Exhaust gases from the thermal oxidation chamber pass first through a “boiler” section, built into the thermal oxidiser. Heat is recovered from these very hot gases to generate steam for the process area.
6. After passing through the steam generating section of the thermal oxidiser the exhaust gases then pass through a further heat recovery process in which the incoming combustion air will be pre-heated before entering the thermal oxidiser chamber.
7. Finally exhaust gases are vented to the atmosphere through the stack.

Maintenance Plan:

Various checks are carried at specific intervals. Weekly checks are carried out on the low level alarms and are recorded by the maintenance representative. The cups and filters are cleaned once a week. A blowdown takes place daily. All flanges are checked for leaks on a daily basis.

A contracted engineering consultant attends the site weekly and does an overall check on the entire plant. The chamber is accessed every month and checked for a build-up of scale and repairs to the brickwork and

all pipes are checked and cleaned if necessary. Efficiency tests are carried out bi-annually and the reports are retained file.

Monitoring of the Thermal Oxidiser:

The Thermal Oxidiser is monitored as per IPPC Licence, the schedule is outlined in table 6.1 below.

Table 6.1 Thermal Oxidiser Monitoring Program				
Parameter	Analysis Method/Technique	Frequency	Key Equipment	Emission limit
Combustion Temperature	-	Continuous	Temperature probe plus spare	N/A
Oxygen Content of the flue gases	-	Continuous	Oxygen Analyser	N/A
Pressure of Flue gas	-	Continuous	Pressure transmitter	N/A
Temperature of the Flue gas	-	Continuous	Temperature probe plus spare	N/A
Combustion air flow	-	Continuous	Air flow meter	N/A
Flame Flow	-	Continuous	Flow meter	N/A
Volumetric Flow	Pitot Tube	Bi-Annually	Note 1	48,000m ³ /hr
SOx	Flue gas analyser	Bi-Annually	Note 1	500 mg/m ³
NOx	Flue gas analyser	Bi-Annually	Note 1	475 mg/m ³
TOC	Portable FID	Bi-Annually	Note 1	20 mg/m ³
Particulates	Isokinetic/Gravimetric	Bi-Annually	Note 1	30 mg/m ³
Ammonia	Based on IS EN 14791	Bi-Annually	Note 1	5 mg/m ³

Note 1: Monitoring to be conducted by ISO17025 accredited contractor

Back up plans/procedures in case of failure:

In the event of the thermal oxidiser shutting down the entire production on site ceases. An assessment is made of the breakdown in terms of duration of repairs availability of parts etc. The appropriate stakeholders are informed (Management, Suppliers and the EPA). Based on time line until reinstatement of the TO incoming loads are diverted. Plans/Arrangements are made to remove unprocessed waste to another licensed facility, for breakdowns exceeding that may exceed 24hours or if instructed by the EPA.

Spare parts:

The Thermal Oxidizer is a very specialized type of equipment and for this reason a substantial number of spares are held on site as well as annual maintenance contracts with specialized companies.

Reference Records

- Daily Plant Checklist
- Temperatures Check
- TO Data Logger
- Operational Control Log
- Notification of Incidents
- Corrective & Preventative Action

6.1.2 Biofilters

Dublin Products have three wood chip biofilters on-site for the treatment of room-air. The basic principle of a biofilter when applied to air filtration and purification is that it uses microorganisms to remove air pollution. The air flows through a packed bed (wood chip) and the pollutant transfers into a thin biofilm on the surface of the packing material. Microorganisms, including bacteria and fungi are immobilized in the biofilm and degrade the pollutant. Biofilter media moisture control is essential for odour reduction through a biofilter. Inadequate moisture can allow the media to dry out, deactivating the microbes, and creating cracks and channeling of air which results in a reduction of filter efficiency. Too much moisture can plug some of the pores in the media, causing channeling and limiting oxygen flow in saturated areas of the filter, thereby creating anaerobic zones in the biofilm. Excess moisture is generally not a problem because the additional moisture drains through the media or evaporates due to the constant airflow through the biofilter

General Operation

- Air from various sources across the site are drawn to the biofilter via ducting and fans.
- The air stream enters the biofilter at the bottom of the media bed and is evenly dispersed across the bottom of the bed under the media by ducting
- The air is then forced to travel upward through the media where microorganisms act to remove odour causing compounds such as VOC's, Sulphides, ammonia etc.
- In order to maintain the media and microorganisms the media is irrigated to maintain moisture content. The irrigation system is run on a timer. (Recommended moisture contents for biofilters range from 40 to 65% wet basis).
- In Dublin Products the irrigation water is captured below the media and is constantly re-circulated through the system.

Maintenance Plan

There are four areas of maintenance required on the biofilters:

Irrigation system:

1. Once per week the sprinklers on the biofilters are checked for proper operation (All sprinklers are working and the entire surface of the bed is getting watered), any damaged or defective sprinklers are removed or repaired.
2. Water pumps should be checked as per maintenance schedule (Spares should be kept on site in the event of a pump failure).

Weed control

Weed growth on the biofilter surface can reduce the treatment efficiency by causing air channeling and limiting oxygen exchange. Roots can contribute to plugging of biofilter pores. The biofilter bed should be regularly assessed and weeds removed by pulling or a systemic herbicide or some other means could be used to control weeds.

Rodent control

A good rodent control program is essential with a biofilter. Mice and rats can burrow through the warm media during the cold winter months causing channeling and poor treatment. Dublin Products employ a contract pest control company to assess and control rodents and pests on-site

Pressure /Airflow

Over time the degradation of the media material and dust buildup in the media and media settling will cause the pressure drop across the media to increase. As pressure drop increases the amount of air moved by the ventilation fans decreases. This decrease in flow will eventually result in poor building ventilation. The type of biofilter media and the dustiness of the exhaust air will both affect the length of time before the media plugs and the pressure drops become excessive. Depending on the design of the biofilter and ventilation fans, pressure drops over 50% of the design pressure drop indicate the need to replace the media. Note that the maximum pressure drop must be measured at maximum ventilation rates.

- Periodic airflow measurements and pressure drop measurements should be taken and recorded
- The fans should be maintained as per maintenance schedule, fan blades, pulleys/belts etc should be checked)
- At least once per year or after any accidental strikes etc the ducting should be checked from source to biofilter for any blockages/ damage/ leaks etc and repairs made when necessary

Monitoring details

Table 6.2 Biofilter Monitoring Program					
Location	Parameter	Analysis Method/Technique	Frequency	Key Equipment	Emission limit
Inlet gas	Gas Loading	Flow meter	Monthly	Windvane/pitot	As per IPPC ELV
	Differential Pressure	Manometer	Daily	Manometer	Pressure drops over 50% of the design pressure drop ^{Note 1}
	Temperature	Thermocouple	Daily	Temperature probe	N/A
	Relative Humidity	Hygrometer	Weekly	Hygrometer	N/A
Inlet and Outlet Gas	Mercaptans	Colorimetric Indicator tube	Weekly	Sampling hood on outlet/ Colorimetric Indicator tubes	Outlet – 5 ppm ^{Note 2}
	Ammonia	Colorimetric Indicator tube	Weekly		Outlet – 50 ppm ^{Note 2}
	Hydrogen Sulphide	Colorimetric Indicator tube	Weekly		Outlet – 5 ppm ^{Note 2}
	Amines	Niosh 2010	Bi-Annually		Outlet – 5 ppm ^{Note 2}
Bed Media	Condition	Visual	Daily	N/A	Evidence of Channeling/Weed/Pest activity ^{Note 1}
	Moisture Content	Standard laboratory method	Quarterly	External Analysis ^{Note 3}	Pooling/Dry spots/Moisture outside range of 40 to 65% wet basis ^{Note 1}
	pH	pH Probe	Quarterly	pH Probe	6.5 -7.5
	Ammonia	Standard laboratory method	Quarterly	External Analysis ^{Note 3}	N/A
	Oils,fats and grease	Standard laboratory method	Quarterly	External Analysis ^{Note 3}	N/A
	Total Viable count	Standard laboratory method	Quarterly	External Analysis ^{Note 3}	N/A
General	Drains	Visual- check for free flow	Daily	N/A	Any evidence of fouling
	Sprinkler system	Operational check	Daily	N/A	Any evidence of fouling or poor distribution
	Fan	Operational check	Daily	N/A	Evidence of changed flow rate
	Odour	As per AG-4	Daily	N/A	Not to give rise to Nuisance Odour
	Negative pressure	Air current tubes	Monthly	N/A	Negative pressure not achieved

Note 1: Action Value

Note 2: IPPC emission limit value

Note 3: Accredited external laboratory used for analysis

Back up plans/ procedures in case of failure

1. An assessment is made of the breakdown in terms of duration of repairs availability of parts etc.
2. The appropriate stakeholders are informed (Management/suppliers and the EPA)
3. Odorous gas streams sent to Biofilter 2 can if needed be redirected to Biofilter 3 and vice versa in the unlikely event that both biofilters are non-operational the Category 1 operation is shutdown and inbound materials are diverted to another facility.
4. In the event that Biofilter 1 is non operational, the Category 3 operation is shutdown and the Category 3 materials are transferred to Category 1 facility for processing.

List of spare parts

- 3 motors
- 1 full fan
- 3 impellers
- 3 shafts
- 3 full sets of bearings
- Spare ducting
- Electrical spares

Reference Records

- Daily Plant Checklist
- Corrective & Preventative Action
- Notification of Incidents
- IPPC license returns
- Operational Control Log
- Pest Control Records

6.1.3 Boilers

There are three steam boilers on the Dublin Products site in Dunlavin. The boilers are set up to automatically monitor the steam supply and the steam requirements of the process area, and the boilers are only fired if there is a deficit in the steam supply being delivered by the thermal oxidiser. The system is set up in such a way that the boilers automatically come into service in such an event. Monitoring and control of the boilers are carried out in accordance with the IPPC licence.

General Operation

1. The steam boilers are fired either using fuel oil or tallow oil.
2. The boilers are only fired if there is a deficit in the steam supply being delivered by the thermal oxidiser
3. The burner is automatically controlled to ensure that in the event of insufficient steam is being produced from the thermal oxidizer that boilers will kick in to make up for demand.
4. Combustion exhaust gases are vented to the atmosphere through the stack.

Maintenance Plan

Once per year prior to annual Insurance audit:

1. The safety valves are stripped down and cleaned.
2. The water-side is opened and debris is removed from this area.
3. The fire tubes are cleaned out.
4. The water level controls are then examined. (Mobery)
5. The crown valve must be cast steel and this must be verified. It is checked officially once a year by Infosisk. The insurance inspector checks this also.
6. The boiler tubes are cleaned out when required. It is not part of the routine maintenance.
7. The laboratory technician for Dublin Products Ltd. performs in house water checks. Ref "Boiler Water Log" record. This record is kept on PC in the laboratory.
8. Specialised Subcontractors are employed to check the water quality. This company also provide chemicals which are added to the boilers. A service contract is held with this company.

Other:

- Chemical dosages to the boilers are set on a timer and are automatically released when required.
- Blow-down is carried out once a day by the fitters
- A specialist company carry out a thorough analysis several times a year. These records are kept in the laboratory. Reference "Service report & certificate of conformity".
- A specialist company check the softening plant. An official inspection is carried out twice a year with which the company are presented with a report. They are also on call for any unexpected problems arising in the softening plant.

Monitoring details

Air monitoring is carried out biannually according to the IPPC licence schedule.

Parameter	Analysis Method/Technique	Frequency	Key Equipment	Emission limit <i>Note 2</i>
Volumetric Flow	Pitot Tube	Bi-Annually	<i>Note 1</i>	23,500m ³ /hr
SOx	Flue gas analyser	Bi-Annually	<i>Note 1</i>	80 mg/m ³
CO	Flue gas analyser	Bi-Annually	<i>Note 1</i>	45 mg/m ³
NOx	Flue gas analyser	Bi-Annually	<i>Note 1</i>	775 mg/m ³
Particulates	Isokinetic/Gravimetric	Bi-Annually	<i>Note 1</i>	30 mg/m ³

Note 1: Monitoring to be conducted by ISO17025 accredited contractor

Note 2: Results of boiler monitoring shall be referenced to the following standard conditions Temperature 273K, Pressure 101.3 kPa, dry gas; 3% oxygen for liquid and gas fuels

Back up plans/procedures in case of failure

1. As the boilers are not used to treat gases from the production area they are not considered part of the odour abatement strategy. However as they are used to produce steam for the production process any downtime may impact on the production capacity of the site and therefore have some impact on odour indirectly.
2. It is considered highly unlikely that all three boilers would be offline at any one time, and it is considered that one boiler would be able to make up any shortfall on steam demand should two be offline.
3. In all cases of boiler failure, an assessment is made of the breakdown in terms of duration of repairs availability of parts etc.
4. The appropriate stakeholders are informed and a plan put in place.
9. In the unlikely event of all three boilers being broke down (Offline) then the site will cease operation any incoming materials will be diverted to another licenced facility and if deemed necessary materials already on-site will also be sent to another facility for treatment. Full production will not re-start until boilers are back online.

List of spare parts

A substantial number of spares are held on site as well as annual maintenance contracts with specialized companies.

Reference Records

- IPPC license returns
- Daily Plant Checklist
- Notification of Incidents
- Operational Control Log
- Corrective & Preventative Action
- Boiler Log

7 ODOUR MONITORING

7.1.1 Self Assessment

A trained member of staff from Dublin Products will complete an odour patrol on each day of production in accordance with work instruction reference WI No.016. This procedure sets out that the odour assessment is carried out by a trained member of staff who has not yet been on the site. Typically it is carried out first thing in the morning. This procedure for odour impact assessment is written in accordance with the Agency Guidance "Air Guidance Note 5 (AG5) Odour Impact Assessment Guidance for EPA Licensed Sites. The results of the daily odour patrol are recorded on the odour assessment form (Ref. EMR 017).

The daily odour assessment allows for potential odour sources to be identified, reduced or eliminated and it maintains odour control as a top priority for management. It also greatly reduces the risk of potential odour and is seen as a valuable exercise and proactive practice.

Limitations:

DP recognise that self-assessment has limitations in regard to Odour Adaption: This is a common and entirely normal desensitisation to certain odours that may affect individuals. Staff working at a site will get used to, and therefore adapt to, specific odours from the site. This adaption means that even if they try to assess the site objectively, they may not be able to do so. Individuals may not be aware that they have adapted to a particular smell because they will continue to respond normally to other odours. The manner in which adaption occurs varies amongst odours. It may take less than a second or it may take weeks to occur depending on the odour. It is not permanent and a person will begin to recover when they are no longer exposed to that particular smell, or when they are exposed to reduced levels of it. The adaption/recovery process/cycle slows with time.

7.1.2 Environmental Compliance Testing/Monitoring

As per the requirements of IPPC Licence P0041-03. Dublin Products complete and report to the EPA on a range of environmental emissions including:

- Emissions to Air
- Emission to Water
- Noise emissions

All monitoring and testing is carried out in compliance with the conditions of the licence. An Annual Environmental Report (AER) is also submitted to the EPA by Dublin Products.

7.1.3 Complaints Procedure and Log

Dublin Products have in place a number of policies and procedures in relation to odour complaints from the public. These are documented in the following work instructions and record forms.

- EMR 017 Odour Assessment Record
- EMR 010 Corrective Action/ Incident Report
- WI016 Odour Assessment Methodology
- WI015 Complaints from Public to Control Room
- EMR 020 Public Complaint Record

In all cases complaints are treated in the upmost seriousness. Details of the complaint are recorded on the Corrective & Preventative Action record 010 and an investigation is undertaken to assess the following:

- If there is an issue off site (An off-site odour assessment is completed as soon as possible after receipt of the complaint as per WI016 at the same time another person completes an on-site assessment of odours) *Note this make take up to 30mins or more as the assessors if they have been on site will need to shower, change clothes and be away from the site for a minimum of 15 minutes before the assessment can take place.*
- Having regard to the possible delay in conducting the assessment against the receipt of the complaint DP recognise that the odour may have dissipated before the assessment is made. Therefore if no nuisance odour is detected off site by DP staff conducting the assessment. DP undertake to review the climatic conditions at the time around the complaint and the activities on site at that time as part of the investigation. Including areas such as raw material intake, production information, building integrity, weather conditions and unusual events (emergency releases) are also recorded.
- If the complaint is verified off-site, the source of the odour shall be identified if possible (as either attributable to DP or other local source, the assessor shall note a description of the odour and its strength and persistence). As part of this climatic conditions and the activities on site at that time shall also form part of the investigation.
- The root cause of odour release if attributed to DP shall be determined and corrective actions put in place
- The relevant stakeholders are informed where necessary as to the outcome of the investigation and corrective actions to be taken

8. REVIEW SUMMARY

As part of its commitment to operating the plant to the highest levels of Environmental Protection and compliance Dublin Products review on an annual basis its strategies and policies around odour control. The plan includes short term, medium term and long term goals and objectives and is a living plan under constant review based on changing business needs, available resources and unforeseen events.

The following tables outline the short and long term goals and objectives set out during the 2021 review,

Table 8.1 2021 Short Term (Year 1) Odour Control Improvements Strategy and Policies					
Goal/Objective	Purpose/Rational	Plan	Responsible Person	Target date for completion	Outcome
Review OMP	Continuous improvement	Review OMP	EHS/Management	December 2021	Complete
		Re-assess Improvement Plans	EHS/Management	December 2021	Complete
		Communicate with Staff and stakeholders	EHS/Management	December 2021	Complete
Extend inlet pipe to Aerator no. 1.	Continuous improvement To mitigate potential for odour	Extend the inlet pipework to the reception tank at Aerator no. 1	EHS/Management	December 2021	Complete
To assess the efficiency of the Biofilters	Olfactory Assessment of Biofilters	Employ a specialist consultant company	EHS/Management	December 2021	Complete
		Collect representative odour samples	EHS/Management	December 2021	Complete
Refurbishment works on Cat 1 Process Area	Continuous improvement To reduce fugitive emissions	Replace damaged cladding	EHS/Management	December 2021	Complete
To ensure building integrity	Continuous improvement To reduce fugitive emissions	Carry out repair works to the floor of the Cat 3 process area	EHS/Management	December 2021	Complete

Table 8.1 2021 Short Term (Year 1) Odour Control Improvements Strategy and Policies

Target date for completion	Target date for completion	Target date for completion	Target date for completion	Target date for completion	Target date for completion
Upgrade Process building materials	As the building age materials may deteriorate, therefore increasing fugitive emission	Where leaks are detected from build materials or ducting repairs should be made	Maintenance	Ongoing	Ongoing
		Complete overhaul of building fabric	Management	As Necessitated by building integrity evaluations	
Assess and clean grates on room extraction ducting	To ensure maximum air extraction can take place from room air in process areas.	Power wash grates along the overhead ducting	Management	Ongoing	Ongoing

Table 8.2 2021 Medium Term (Years 2 to 3) Odour Control Improvements Strategy and Policies

Goal/Objective	Purpose/Rational	Plan	Responsible Person	Target date for completion
Review OMP	Continuous Improvement	Review OMP	EHS/ Management	December 2022
		Re-assess Improvement Plans	EHS/ Management	December 2022
		Communicate with Staff and stakeholders	EHS/ Management	December 2022
Upgrade Biofilters	Continuous improvement	Monitor Emission trends	EHS/Management	As Necessitated by odour assessment sampling
	Standard Programme	Keep informed of odour abatement technology improvements	EHS/Management	
		Media Replacement	EHS/Management	

Table 8.3 2021 Long Term (>3 years) Odour Control Improvements Strategy and Policies

Goal/Objective	Purpose/Rational	Plan	Responsible Person	Target date for completion
Replace or upgrade Biofilters	Continuous improvement	Monitor Emission trends	EHS/Management	Ongoing
		Keep informed of odour abatement technology improvements	EHS/Management	Ongoing
		Media Replacement	EHS/Management	As required
Upgrade Process building materials	As the building age materials may deteriorate, therefore increasing fugitive emission	Monitor Fugitive Emission trends	EHS/Management	From 2021
		Where leaks are detected from build materials or ducting repairs should be made	Maintenance	Ongoing
		Complete overhaul of building fabric	Management	As Necessitated by building integrity evaluations

