

BEST AVAILABLE TECHNIQUES & OPERATING TECHNIQUES (BATOT)

Permit Variation Application, Sandycroft

Prepared for: 2 Sisters Food Group Ltd

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1.0 Introduction

SLR Consulting Limited (SLR) has been instructed by 2 Sisters Food Group Ltd (2SFG) to prepare an application for an Environmental Permit (EP) variation for their poultry processing facility located at Glendale Avenue, Sandycroft, Flintshire, CH5 2QP (the site). The EP variation will be submitted to Natural Resources Wales (NRW) for determination.

The site is currently permitted (EPR/YP3632EM) for processing; including the portioning, deboning and filleting of chicken. The EP includes the following listed activities as per the Environmental Permitting (England and Wales) Regulations (EPR) 2016 (as amended):

- Section 6.8 Part A(1)(b) : slaughtering chickens at a plant with a carcass production capacity of more than 50 tonnes per day.
- Section 6.8 Part A(1)(d)(i) : treatment and processing of chicken with a finished production capacity greater than 75 tonnes per day.
- Section 5.4 Part A(1)(a)(ii) : disposal of non-hazardous waste with a capacity greater than 50 tonnes per day involving physio-chemical treatment.

The following Directly Associated Activities (DAA) also take place on site:

- Combustion plant: 4.6MWth light fuel oil fired boilers for steam supply.
- Cleaning: cleaning of storage, production, and waste areas and associated equipment.
- Waste handling: production, handling and storage of waste arising from the installation for off-site disposal.

2SFG proposes to make the following changes to the EP:

1. review current site operations against up-to-date criteria (i.e., Best Available Techniques) and assess current potential environment impacts from onsite operations;
2. addition of a new loading bay; and
3. consolidate the EP and its variations.

This Best Available Technique and Operating Techniques (BATOT) document describes how the site has been designed and is operated in accordance with Best Available Techniques (BAT) as described in NRW guidance and relevant European Union Best Available Techniques Reference (BREF) notes.

1.1 The Site

The site is centred on National Grid Reference SJ 32813 67402 on Glendale Avenue, Sandycroft, Flintshire, CH5 2QP. The site is accessed via Glendale Avenue, which connects to Chester Road (B5129) further to the west.

The site location is illustrated on Drawing 001; the site layout is shown on Drawing 002; the EP boundary and emission points are shown on Drawing 003; local receptors (500m buffer) is shown on Drawing 004; and the natural and cultural heritage (1000m buffer) is on Drawing 005.

The site is in an Industrial Estate and is surrounded by predominantly commercial/industrial premises. Residential properties are in close proximity (approximately 15m to the west) to the site. Also, approximately 180m west is Sandycroft Primary School. The River Dee is located 600m north of the site. To the south beyond the B5129 lies agricultural fields.

2.0 Amendments Required to the Existing EP

2SFG wish to make the following amendments to the existing EP:

- consolidate the previous EP variations into a revised EP for the site;
- incorporate the wet chemical scrubber and sludge scrubber as an emission point to air;
- incorporate the proposed loading bay; and
- incorporate the two light fuel oil boilers into the EP as medium combustion plant (MCP).

3.0 Management

3.1 Management System

2SFG operates an Environmental Management System (EMS) which ensures that:

- the risks that the activities pose to the environment are identified;
- the measures that are required to minimise the risks are identified;
- the activities are managed in accordance with the management system;
- performance against the management system is audited at regular intervals; and
- the EP is complied with.

The company's Environmental Policy clearly defines 2SFG's commitment to continual improvement, to minimising the impact of the site activities on the environment and to complying with relevant legislation and other requirements to which the company subscribes.

The EMS is supplemented by this BATOT document which outlines the proposed operating techniques at the site and demonstrates conformance with the requirements of relevant published NRW Guidance.

3.2 Management Structure and Responsibilities

The Operations Manager is responsible for day-to-day operations and compliance with the EP. Whenever the site is open to receive birds, or conducting bird handling operations, it is supervised by sufficient members of staff who are suitably trained and fully conversant with the requirements of the EP regarding:

- operational controls;
- maintenance;
- record-keeping;
- emergency action plans; and
- notifications to NRW.

3.3 Technical Competence and Training

The site is managed by sufficient staff who are competent to operate the site. The management system ensures the following are in place:

- all staff have clearly defined roles and responsibilities;
- records are maintained of the skills required for each post;

- records are maintained of the training and relevant qualifications undertaken by staff to meet the requirement of each post; and
- operations are governed by Standard Operating Procedures (SOPs).

An assessment of staff training needs is carried out annually to identify the posts for which specific environmental awareness training is needed, and to determine the scope and level of such training.

The training programme ensures that relevant staff are aware of the following:

- regulatory implications of the EP for the site and their specific work activity;
- all potential environmental effects from operations under normal and abnormal circumstances;
- the need to report deviations from the EP; and
- prevention of accidental emissions and the action to be taken should accidental emissions occur.

Appointed sub-contractors required to undertake work on site are subject to a site induction which addresses site requirements with respect to environmental protection and are managed in accordance with the site's permit to work system.

3.4 Site Security

In order to prevent unauthorised access, a number of security measures are in place at the site including:

- security fencing surrounding the site perimeter;
- manned gatehouse;
- a lockable steel access at gate at the site entrance / exit;
- access gates closed at all times when access is not required;
- security lighting;
- closed circuit television (CCTV);
- lockable doors on the waste consolidation building and office/welfare facilities;
- CCTV coverage of all external areas;
- monitored alarm system;
- inspection and maintenance procedures; and
- a visitor sign in system.

Gates and fencing are inspected at the commencement of each working day. Any defects or damage which may compromise the integrity of the enclosure are made secure by temporary repair by the end of the working day. Permanent repairs are affected as soon as practicable. All inspections and any defects, damage or repairs are recorded in the site diary.

In the event of a breach of security at the site, the cause is investigated, and appropriate mitigation measures implemented. This is recorded in the Daily Site Log. Records maintained include inspections and maintenance of doors and locks, breaches of security, investigations and actions taken.

The Site Manager is responsible for the monitoring and recording of investigations or remedial actions in the site diary in accordance with the management system.

3.5 Environmental Permit Surrender

To assist in future EP surrender, records are maintained to demonstrate how the land beneath the site has been protected at all times between the date of EP issue and the end of EP operations.

Records maintained include:

- maintenance of impermeable surfacing;
- maintenance of drains and sumps; and
- actions taken to clean up incidents and spillages.

3.6 Display of Environmental Permit

A copy of the EP is kept available for reference by all staff and contractors whose work may have an impact on the environment.

3.7 Managing Documentation and Records

Controls are in place to ensure that all documents are issued, revised and maintained in a consistent fashion.

The documents included within the scope of the controls are as follows:

- policies;
- responsibilities;
- targets;
- maintenance records;
- procedures;
- monitoring records;
- results of audits;
- results of reviews;
- complaints and incident records; and
- training records.

Site diary entries are made and kept up to date on a daily basis to reflect deliveries, on-site treatment and dispatches.

3.8 Reporting Non-Compliance and Taking Corrective Action

Procedures ensure appropriate corrective action is taken in response to problems identified at the site. The procedures ensure that non-conformances are reported, investigated and rectified, and that failures and weaknesses are prevented. The following aspects are considered:

- actual or potential non-compliance;
- system failure discovered at internal or external audit;
- suppliers or subcontractors breaking the agreed operating rules;
- incidents, accidents, and emergencies;

- malfunction, breakdown or failure of plant;
- other operational system failure; and
- complaints.

The action taken in response to the non-conformance may include:

- obtaining additional information on the nature and extent of the non-conformance;
- discussing and testing alternative solutions;
- modifying procedures and responsibilities;
- seeking approval for additional resources and training; and
- contacting suppliers and contractors (as applicable).

3.9 Auditing and Legal Compliance

There is a formalised internal auditing procedure to ensure the facility is audited at defined intervals and that the progress of corrective and preventative action is monitored.

3.10 Monitoring, Measuring and Reviewing Environmental Performance

The management review procedure assesses environmental performance and ensures any necessary actions are taken.

3.11 Operational Control, Preventative Maintenance and Calibration

The management system complements operational procedures so as to ensure effective control of site operations, the use of approved suppliers and contract services, the maintenance of operational equipment and the calibration of any monitoring equipment.

All plant and equipment are subject to a programme of planned preventative maintenance (PPM) which follows the inspection and maintenance schedule recommended by the manufacturer.

3.12 Design and Construction Quality Assurance

All relevant elements of the site are designed in accordance with recognised standards, methodologies and practices.

The design process uses a risk-based approach and are appropriately documented using drawings, specifications and method statements to provide an adequate audit trail.

Construction Quality Assurance (CQA) plans govern all construction activities necessary in the future and have been prepared for the loading bay extension. These CQA plans are prepared by competent and suitably qualified persons and detail the assurance and validation process for relevant elements of the installation which include:

- material selection;
- handling, storage and installation; and
- conformance and performance testing; inspection and validation.

A competent and suitably qualified person will supervise the construction activities.

3.13 Accidents and Emergencies

2SFG has established and maintains an Emergency Preparedness and Response Plan as part of its EMS. This documents the emergency response to be implemented in the event of emergency situations and accidents, including significant pollution incidents. This plan includes details of emergency services, contact numbers for key site personnel and guidance on when external emergency services/agencies should be alerted.

The Plan is regularly reviewed and where necessary revised to incorporate any additional accident or emergency scenarios arising from new plant and equipment that may be installed. Appropriate training is provided to employees and contractor staff to ensure that response to an incident is prompt and efficient.

4.0 Overview of Current Operations

The site is a poultry slaughterhouse and processing facility. The site receives and processes an average of 134,000 live birds a day. Refer to Drawing 003 for the installation boundary.

The installation comprises all areas of the site involved in processing of the birds; storage and management of associated waste and treatment of generated effluent including:

- lairage, slaughter and primary processing including bleeding, scalding, de-feathering and evisceration;
- chilling, maturation, portioning, packing and despatch of final products;
- cleaning of storage, production and waste areas and associated equipment and machinery;
- handling and storage of waste arising from the installation for safe disposal;
- treatment of process effluent at the effluent treatment plant (ETP), followed by discharge to sewer;
- wet chemical scrubbing system (comprising the wet chemical scrubber and sludge scrubber) to abate odour from the scald de-feather process; evisceration area; blood tank; sludge tanks; screen and solids reception at the ETP; tanks at the ETP and waste tankers (temporary connection); and
- combustion of light fuel oil to produce steam and heat water needed for the production and cleaning processes.

The site comprises: of one main building and the following ancillary areas:

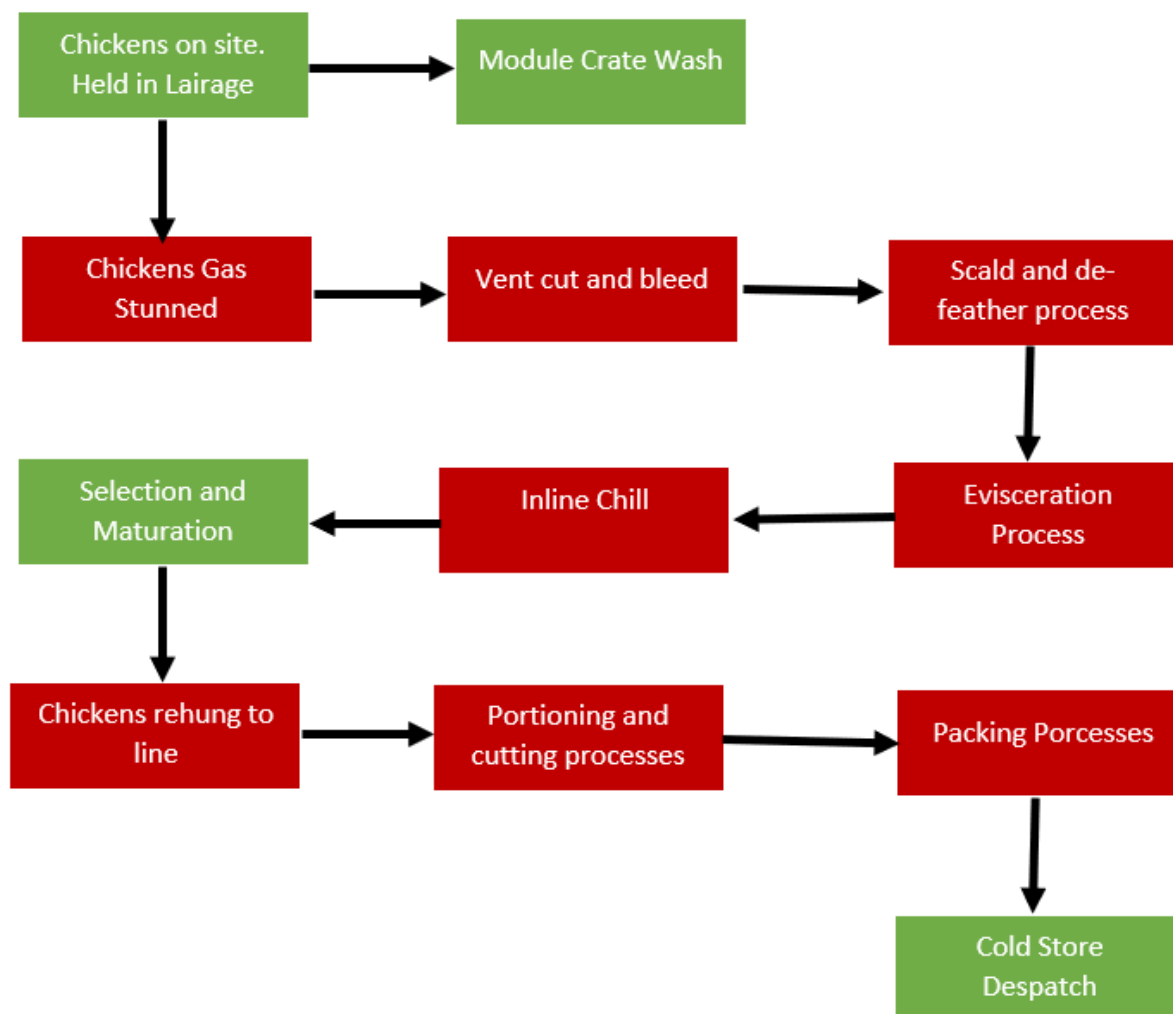
- main process building;
- effluent treatment plant;
- boiler house;
- equipment store; and
- electricity substation.

The site employs over 900 employees with a range of work patterns, including days, morning, afternoon and night shifts. Each working day consists of 06:00 to 14:00 shift and a 14:00 to 22:00 shift, there is a hygiene shift after the two productions shifts. The plant operates six days a week with maintenance shifts at weekends.

4.1 Product Process Flow

Details of the product process flow are given in Figure 1 below.

Figure 1 Process Flow Diagram



4.2 Process Steps

Process steps are outlined in the sections below.

4.2.1 Bird Reception

The process begins with reception of live birds within transport crates into the lairage area of the site from road transport. Birds are stunned using carbon dioxide gas (CO₂) prior to slaughter. Blood is collected from the blood trough in the slaughter area and piped to a sealed refrigerated tank, prior to removal from site by tanker. The process is controlled by procedure 'FF002 Blood Handling Procedure'. If the tank level reaches either the high or high-high level controls, the blood pump will automatically switch off. The blood storage tank is connected to wet chemical scrubber.

Blood is removed from the site every day. There is a dedicated road tanker charging and control system with the odorous displaced air from the tanker being processed through the wet chemical scrubber. Blood is transferred offsite to a suitably permitted facility for processing.

4.2.2 Scald and Defeather

The scald tanks contain water at 55°C through which the slaughtered birds pass on a shackle line. The water in the tanks is aerated by means of blowers. Water levels within the tanks is controlled via a float valve. Air extracted for this room is discharged to atmosphere via the wet chemical scrubber.

A water flume is used for feather transport through a feather parabolic screen to the feather press and feather trailer; the flume water is recycled back to the defeather area. The scald waters are transferred to the ETP at the end of each working day.

The feather screen has been enclosed and is linked to the wet chemical scrubber. The feathers are pumped to a large feather press where a substantial amount of water (which is returned into the effluent flume by an enclosed pipe via a buffer tank) is removed. The dried feathers discharge onto a conveyor to a trailer waiting below.

The feather trailer is removed from site once or twice a day. Feathers are transferred offsite for rendering. It is a requirement of the haulage contractors, that only clean trailers arrive on site. Trailers are covered once full, prior to leaving site.

4.2.3 Evisceration

The viscera removed from the birds is transported in a water flume to a rotary screen before dropping into a trailer. The screen area is enclosed and connected to the wet chemical scrubber.

Any liquid which collects in the trailer is drained via a valve and allowed to discharge to the site foul drainage system which runs to the onsite ETP. The area around the base of the trailers is regularly covered with sanitising foam throughout the processing day. The viscera trailers are removed from site every processing day. Clean trailers are delivered ready for the next day's processing. The viscera equipment is cleaned on a regular basis.

4.2.4 Offal

Offal is collected internally in the plant and transferred within a closed piping system. It is then placed in a covered dolav container before being transferred to the refrigerated offal trailer. Offal is stored in covered dolavs with ice and held in the refrigerated trailer prior to leaving site.

4.2.5 Rejected Birds

Dead on arrival birds, heads or rejected birds are placed into dolavs after being macerated and stained with a dye clearly marking them as unfit for human consumption and high-risk animal by-products, known as 'Category 3' wastes as per DEFRA classification. These are stored inside and covered. Dolavs are then unloaded to the collection trailer.

4.3 Refrigeration

Cooling systems are also used in the process to control temperature. The blood tank and low risk animal by product wastes (known as 'Category 3' as per DEFRA classification) are refrigerated. The despatch area is also refrigerated to keep product cool prior to transfer offsite. Cooling systems on site comprise a closed loop recirculating system that is topped up periodically with mains water. The system does not discharge to surface water. A cooling tower is part of the cooling system.

Refrigeration at the site is managed by onsite maintenance and also third-party contractors and involves the following:

- water is float controlled in cooling tower sumps and pumped back over coils;
- systems are controlled by production demands;
- all external doors in regard to fridge plant are electrically controlled;

- heat recovery is undertaken through plate heat exchangers to pre-heat factory hot water through a closed loop system which improves energy efficiency;
- stokvis systems used to control steam;
- monitoring to enable efficient dosing of biocides; and
- the cooling system is managed in accordance with the manufacturer's specification and is part of the preventative maintenance programme to enable optimum functioning.

R407F and R434A are used within refrigeration plant. R434A is a reclaimed gas. Due to the high global warming potential (GWP) of R434A (3,245) it is banned from being used in its 'virgin' state. The R434A is used within the air chill. 2SFG have a plan in place to convert this unit to run on carbon dioxide once R434A is banned from use entirely. R407F has a lower global warming potential of 1,825 and is not banned from being used in its 'virgin' state.

Refrigeration equipment on site are detailed in Table 4-1 below.

Table 4-1 Refrigeration Equipment Details

No. of units	Description of Refrigeration Equipment	Refrigerant	Quantity of refrigerant (kgs)	Compressor details
1	Main plant Mat Chill No1 and Main Maturation Chill.	R407F	2500kg 1500kg	3 X Bitzer Pack and 3 X Screw Compressors. 2 X Grasso 4-11
1	Air chill.	R434A	3500kg	6-11 x2. Grasso compressors 6-12 x1 Grasso

4.4 Packaging

The packaging process consists of the following main steps:

- buyers review weekly production plan;
- packaging orders are placed as detailed within the production plan;
- information is then sent to intake team;
- packaging orders arrive on trailers and are unloaded and registered;
- all packaging is stored in the warehouse and logged within the racking system;
- packaging is then picked as detailed in the production plan; and
- packaging is delivered into the main factory ready for the production lines.

4.5 Despatch

The despatch process consists of the following main steps:

- the site receives weekly delivery schedules;
- despatch administration manage the schedules;
- the site produces weekly production plans;
- products are produced on the production lines and packed;
- products are stacked in crates onto pallets and stored in the dispatch chiller;
- temperature checks are completed; and

- trailers arrive in line with the delivery schedule and are loaded with required products.

4.6 Combustion Plant

The following combustion plant are in operation at the site for steam generation to heat water needed for the production and cleaning processes:

- 2 x light fuel oil fired steam boilers with thermal rated input of 4.6 MWth each.

The boilers are directly associated activities to the main activities undertaken on site.

4.7 Waste Streams

Table 4-2 presents the waste streams and animal by products involved in the process.

Table 4-2 Waste Streams & Animal by Products

Waste stream	Source of waste	Minimise waste?	Quantity generated in 2021 (tonnes)	Onsite Storage	Frequency of Removal from Site	Onwards recovery / disposal method
Animal by Products Category 3 Carcass, Liver, Hearts and Necks	Chicken Slaughter Process	N/A	27626	Carcasses are stored in the category 3 trailer	The Category 3 trailer is removed from site twice a day	Rendering
				Liver, hearts, lungs and gizzards (offal) are collected internally in the plant and transferred within a closed piping system. Offal is stored in covered Dolav's with ice and held in a refrigerated trailer prior to leaving site.		Pet Food
Animal by Products - Feather, Viscera and Feet	Chicken slaughter Process	N/A	22706	Feathers are stored onsite in the feather trailer.	Feathers are removed from site twice a day	Rendering
				Viscera is stored in a bulk trailer	Viscera is removed from site once a day	Rendering
				Feet are stored in the Category 3 trailer	The Category 3 trailer is removed from site once a day.	Rendering

Waste stream	Source of waste	Minimise waste?	Quantity generated in 2021 (tonnes)	Onsite Storage	Frequency of Removal from Site	Onwards recovery / disposal method
Animal by Products Category 2 Blood	Chicken Slaughter Process	N/A	2947	Blood in the blood trough is piped to a sealed tank	Once a day via tanker	Incinerated
Animal by Products Category 2 Dead on Arrival / Reject	Chicken Slaughter Process	N/A	1733	Placed into dolavs after being macerated and stained with a dye clearly marking them unfit for human. These are stored inside the PRP area in covered bins. The bins are then unloaded to the collection trailer.	The Category 2 Dead on Arrival / Reject trailer is removed from site every one to two days	Incinerated
Sludge	ETP water treatment	N/A	10922	Sludge is pumped from the dissolved air floatation unit into 1 of 2 storage tanks.	Collected by tanker at least twice a day.	Anaerobic Digestion
General waste	Factory process	Segregation of waste	820	General Waste Skips	Daily	Landfill
Cardboard and Plastics	Packaging	Cardboard and plastic Segregation Reduce waste via suppliers.	54	Cardboard and plastic waste are stored in waste skips.	Bi-weekly	Recycle
Metals	Maintenance	Re-use materials where possible.	49	Metals are stored in a covered skip.	No set time frame, when the skip is full.	Recycle
Interceptor waste	Clean / Pump out	N/A	29	Interceptors	Bi-Annually	Separation treatment process.

4.8 Cleaning

All cleaning/hygiene procedures used on site are in accordance with BRC Global Standard for Food Safety (01 August 2018) and Food Standards Agency guidance.

Cleaning processes follow the same 7 stages:

- prepare;
- removal of gross debris;
- pre-rinse;
- application of detergent;
- rinse;
- inspection; and
- disinfection.

All debris removed is stored in dedicated sealed containers whilst awaiting offsite disposal or recovery.

4.9 Wet Chemical Scrubber

The wet chemical scrubber was installed to abate odour from the scald and de-feather process (refer EPR/AP3633HT/V003). However, it is also noted that the following areas are also routed via the chemical wet scrubber:

- evisceration area;
- screen and solids reception at the ETP;
- tanks at the ETP
- blood storage tank; and
- waste tankers (temporary connection).

It is noted that the wet chemical scrubber needs to be added to the EP as an emission point.

4.10 Sludge Scrubber

The sludge scrubber was designed to extract and abate odorous process air from the sludge treatment plant operations (effluent tanks and sludge tanks). It is noted that the sludge scrubber needs to be added to the EP as an emission point.

4.11 Containment

Containment at the site comprises:

- brick bund around the ETP;
- reinforced concrete bund around the boiler fuel oil tank; and
- chemical storage includes a number of Intermediate Bulk Containers (IBC's) and chemical containers located to the south of the effluent storage area. These are bunded in various localised secondary containment systems. These include:
 - spill pallets;
 - masonry brickwork bunds; and
 - concrete bund with spill pit below.

SLR have undertaken an assessment of containment at the Sandycroft site¹. The findings of this review are being consolidated. 2SFG are aiming to review the containment assessment in 2023 and will put an improvement plan in place where this is considered to be required.

4.12 Drainage

Drainage at the site comprises the following:

- Effluent drains which serve the indoor process areas and drain to the ETP for treatment prior to discharge to sewer through emission point S1.
- Surface water drainage carries uncontaminated surface water from roof tops to either emission point W1 or W2 which are both served by interceptors. The surface water is then discharge to local surface water drainage courses. Interceptors are cleaned every six months and are checked through the preventative maintenance programme weekly.

Refer to Appendix A for the site drainage plan.

4.13 Effluent Treatment

Effluents produced within the site collect in a covered, underground 200m³ sump. The sump transfers effluents to the ETP. The effluent plant includes a DAF (dissolved air flotation) unit for solids separation and various effluent balancing tanks and sludge storage tanks. All tanks are covered. Effluent from the DAF plant is discharged to public sewer under trade effluent discharge consent.

The headspaces of the various effluent tanks, are all linked to minimise any displacement of odorous air to atmosphere. Vents from tankers collecting sludge from the site are connected (during loading operations) to the tank headspaces; sludge are pumped into tankers rather than the tankers using their own vacuum pumps for loading. The system linking the tank headspaces is connected to the sludge scrubber; so that any air displaced from the system is treated prior to venting to atmosphere.

Discharge from the ETP is discharged to sewer under a trade effluent discharge consent issued by Dŵr Cymru/Welsh Water (refer Appendix B). The discharge consent comprises emission limits for the following parameters:

- sulphide;
- oil and grease;
- total suspended solids;
- chemical oxygen demand; and
- chlorine.

2SFG also undertake monitoring of mercury in effluent as per the EP.

4.14 Chlorine Dioxide Dosing

Chlorine dioxide dosing occurs to the site's mains potable water supply to assist in the control of Legionella, biofilms and other harmful bacteria and to prevent contamination of the chicken as it, and equipment, is washed during and after processing. Chlorine dioxide is added to the mains water supply at a dosing rate of between 0.1 and 0.4 ppm.

¹ C736 Secondary Containment Review reference 403.064398.00001 DRAFT dated August 2022.

Once the chlorine dioxide has passed through site processes it changes its composition into a chloride with most of the oxygen having been used up during the disinfection process. This effluent is discharged to the site effluent system. The residual amounts entering the effluent stream are typically no higher than 0.04 ppm.

5.0 Overview of Proposed Site Improvements

5.1 Loading Bay Extension

The extension will be located to the south of the existing chill building and comprise two loading bays. The bays will be sealed from the main factory by roller doors and sealing buffers. The two loading bays will be used either to load finished products from the loading docks or to load a bulk trailer with waste products under cover. The loading bay is primarily being installed to allow for loading of waste including animal by products under cover to prevent amenity issues affecting the local environment. A temporary structure is in place in this area currently to allow for waste to be loaded onto trucks under cover.

Drainage in the new loading bay will join existing internal effluent drains that flow to the ETP. Odour abatement is not considered to be required in the extension as the animal by products will be refrigerated; be stored there for less than 8 hours and be stored out of direct sunlight. The location of the loading bay extension is shown on Drawing 003.

6.0 Chemical usage

The chemicals used on site are detailed in Table 6-1 below.

Table 6-1 Chemical Usage

Chemical	Use	Monthly Usage	Storage	Containment
Perbac	Disinfectant	8000 litres crates and lorry wash	1000ltr IBCs	Bund
Caustak 25	Detergent	2000	1000 litre IBC	Bund
V Wash	Vehicle Wash	1000 litres	1000 litre IBC	Bund tray
Holsolve	Factory cleaning	100 litres	25 litre drums	Bund
Maxi Chlorplus		1000 litres	25 litre drum	
Maxi Foamplus		1500 litres	25 litre drum	
Active		500 litres	25 litre drum	
Sodium Hypochlorite		1000 litres	1000 litre IBC	
V Wash	Vehicle wash	1000 litres as above	1000 litre IBC	Bund tray
Caustak 25	Tray wash	1000 litres from above 2000	1000 litre IBC	Bund tray
Granulite Salt	Effluent Plant	120 kilos Used in Boiler softener. water	25kg bags	

Chemical	Use	Monthly Usage	Storage	Containment
Ferric Sulphate		Not used but will commence trial shortly		
Ferric Chloride		15000 litres	1000 litre IBC	Bund
Polymer		2000 litres	1000 kilo IBC	Bund
Caustak	Tray wash	2000 litres	1000 litre IBC	Catch tray
V Wash	Wagon Wash	1000 litres	1000 litre IBC	Catch tray
SV12P	Boiler Treatment	300litres	25 litre drums	Porta-feed system, integral bund
Polyhib SDS	Condenser treatment	2.5kg	5 kg	Self-dosing system
Disperse SD		25kg	25 kgs	Self-dosing system
Bromine SD		12kg	2.5 kgs	Self-dosing system
CD09P	Chloride Dioxide dosing	90 Litres	25 litre drums	Porta-feed system, integral bund
CD08		90 Litres	25 litre drums	Porta-feed system, integral bund
Maxi foam acid	Factory cleaning	200 litres	25 litre drum	Bund
Descaler		200 litres	25 litre drum	
Sodium Hydroxide	Odour Scrubber	1025 litres	1000 litres IBCs	Bund tray
Sodium Hypochlorite		1000 litres	1000 litres IBC	Bund tray

Chemicals are stored in areas which comprise an impermeable surface and drain to ETP. All chemicals used on site are stored in dedicated external storage areas with secondary containment. Acids and alkalis are stored separately. Table 6-2 below presents the fuel stored at the site.

Table 6-2 Onsite Fuel Storage

Fuel	Container size (litres)	Storage arrangements
1 x Diesel Road Vehicle (DERV) tanks.	54,000	Internally bunded tank.
1 x Boiler oil tank	87,000	Bunded. Reported to only be used up to a capacity of 45,000L
Gas oil tank	10,000	Internally bunded tank.
Gas oil (truck wash) tank	1,136	Internally bunded tank.
Gas oil (trailer wash) tank	1,300	Internally bunded tank.
Engine oil tank	400	Internally bunded tank.
Waste oil (mineral) tank	3600	Bunded.
Waste oil (vegetable) drum	25	Bunded.

7.0 Best Available Technique Assessment

An assessment of operating procedures and techniques at the Installation has been undertaken with respect to the following documents:

- Reference Document on Best Available Techniques in the Slaughterhouses and Animal By-products Industries dated May 2005.
- Draft Reference Document on Best Available Techniques in the Slaughterhouses and Animal By-products Industries dated June 2021.
- BAT Reference Document on the application of Best Available Techniques to Industrial Cooling Systems December 2001.

7.1 Slaughterhouses and Animal By-Products Industries BREF

Please see Table 7-1 for assessment of onsite measures against the Slaughterhouse and Animal By-Product Industries BREF.

Table 7-1 Best Available Techniques – Slaughterhouse and Animal By-Product Industries

BAT Requirement	Specific Measures
5.1.1 General Processes and Operations	
a) Provide training. Giving staff at all levels, from management to shop floor the necessary training and instruction in their duties can help to improve to control of processes and minimise consumption and emission levels and the risk of accidents.	2SFG undertakes regular training to allow competency development for all site staff, bespoke content aligned to defined objectives and other prioritised issues. 2SFG also undertakes environmental competency training sessions for the senior management team and key department leads. 2SFG is considered to be compliant.
b) Use a planned maintenance programme.	2SFG implements a planned maintenance programme at the site. 2SFG is considered to be compliant.
c) Apply dedicated metering of water consumption.	Water usage is metered across site and results recorded. 2SFG is considered to be compliant.
d) Separate process and non-process wastewater.	2SFG separates process and non-process water. 2SFG is considered to be compliant.
e) Remove all running water hoses and repair dripping taps and toilets.	As part of the daily inspections, water leaks are identified and repaired as a priority. 2SFG is considered to be compliant.
f) Fit and use drains with screens and/or traps to prevent solid material from entering the wastewater.	Prior to effluent drains going to the ETP are drain pots to catch waste. Three interceptors are also located at the site which serve the surface water drains. These are cleaned every six months and are checked through the preventative maintenance programme weekly. 2SFG is considered to be compliant.

BAT Requirement	Specific Measures
g) Dry clean installations and transport by-products dry followed by pressure cleaning using hoses fitted with hand-operated triggers and where necessary hot water supplied from thermostatically controlled steam and water valves. By-products and waste from the slaughter and animal by-products treatment processes can be transported as dry as possible and all spillages cleaned up, by sweeping or by using a squeegee, prior to wet cleaning. This reduces the entrainment of organic matter into water.	2SFG dry press feathers to remove water. The category 3 animal by products trailer has a grate at the bottom for water to filter through. 2SFG is considered to be compliant.
h) apply overfilling protection on bulk storage tanks	Overfill protection (alarms) are present on: - the blood tank. - the DAF - 200m³ underground tank (sump), 200m³ balance tank, the 48m³ screening tank. - Two sludge tanks. 2SFG is considered to be compliant.
i) provide and use bunds for bulk storage tanks	A 1m containment wall has been built around the ETP on an impermeable surface and all associated drains are routed back to internal drains or ETP which serves the following tanks: - Screening tank. - Holding tank. - 2 x sludge tanks. SLR have undertaken an assessment of containment at the Sandycroft site. The findings of this review are being consolidated. If there are recommendations within the assessment report to improve containment in areas that may potentially impact groundwater at the site, then 2SFG will incorporate this into an improvement plan. Once the containment assessment has been fully reviewed and 2SFG address any subsequent recommendations, then 2SFG will be considered to meet BAT.
j) implement energy management systems	An annual energy consumption report is compiled and submitted to NRW. 2SFG is considered to be compliant.
k) implement refrigeration management systems	Refrigeration management systems on site are managed by the site service manager and also third-party contractors. 2SFG is considered to be compliant.

BAT Requirement	Specific Measures
l) Operate controls over refrigeration plant running times. - Fit and operate chill room door closing switches - Recuperate heat from refrigeration plants - Use thermostatically controlled steam and water blending valves.	All external doors in regard to fridge plant are electrically controlled. Heat recovery is undertaken on fridge plant through plate heat exchangers to pre- heat factory hot water through a closed loop system. Refrigeration system uses thermostatically controlled steam and water blending valves. 2SFG is considered to be compliant.
m) Rationalise and insulate steam and water pipework i.e., pipework can be divided into zones so that maintenance can be carried out in one area in isolation, without affecting the whole installation.	Pipework is divided into zones based on the process so that maintenance can be carried out in isolation. 2SFG is considered to be compliant.
n) isolate steam and water services (i.e., isolation valves installed in fluid supply pipework for steam, hot water (at 42 °C and 82 °C) and cold water linked to a computer time control of various areas would result in a reduction in water losses. Preventing the wastage of heated water would also save energy.	2SFG do not have isolation valves present on steam and water services which are controlled by the onsite computer system.
o) Implement light management systems Existing fluorescent light fittings in rooms that are normally occupied, with either ineffective reflectors or without reflectors and using two fluorescent tubes can be reconstructed to incorporate a reflector and to use a single energy-saving tube. Energy can be saved without a reduction in the lighting efficiency. In rooms which are not regularly occupied, such as packaging materials store and the hide room, the lighting can be sensor-controlled.	The site has changed out fluorescent tubes for like for like LED's. Only external lights are sensor controlled. The site generally works 24/7 with up to 20hrs production and the rest of time per day allocated to maintenance and cleaning. 2SFG is considered to be compliant.
p) Store animal by-products for short periods and possibly to refrigerate them	Category 2 animal by product wastes (dead on arrival birds and rejected birds) are refrigerated prior to being removed from site once a day for incineration. Viscera (Category 3 animal by product) is stored in covered Dolav's with ice and held in a refrigerated trailer prior to leaving site. The blood tank is refrigerated. 2SFG is considered to be compliant.
q) Audit odour	The site is currently undertaking monitoring and assessment of the potential for onsite odour (refer 410.064648.00001_ORA). Once this assessment is complete, 2SFG will fully review the findings and consider recommendations where required.

BAT Requirement	Specific Measures
	The wet chemical scrubber and sludge scrubber functionality is being assessed as part of these works. 2SFG have procedures in place to manage areas that have potential to generate odour. The animal by product trailer gantry is cleaned down every three hours, washed and foamed to reduce any build-up of odour. Live haul trailer cleaning standards are required to be met not only for odour control but also for prevention of any bird illness between farms. 2SFG is considered to be compliant.
r) Design and construct vehicles, equipment and premises to ensure that they are easy to clean	Vehicles and equipment are procured based on a multitude of factors, including the ability to clean them easily. The new loading bay extension has been designed for easy cleaning and will be connected to the sealed drained system that flows to the ETP. 2SFG is considered to be compliant.
s) clean materials storage areas frequently	The yard areas including in the vicinity of materials storage, are continually cleaned. Yard operatives ensure these tasks are carried out to maintain standards. A foam detergent is used to wash yard areas. Wash water drains to the ETP plant. The live haul trailers are washed as soon as they are unloaded and are not left standing. These are cleaned using disinfectant and detergent which will also reduce the odours under Procedure LRSS001. 2SFG is considered to be compliant.
t) implement a noise management system reduce noise at, e.g., roof extract fans, balance lagoon blowers and refrigeration plants	A noise risk assessment (NRA) undertaken in 2021 by SLR recommended an acoustic barrier be put in place to mitigate noise. It is understood that local residents objected to this on a visual basis. This EP variation application contains a noise management plan for the site (410.064648.00001_NMP). 2SFG is considered to be compliant.

BAT Requirement	Specific Measures
u) replace the use of fuel oil with natural gas, where a natural gas supply is available	The onsite boilers are fired by light fuel oil. There is no mains gas supply to the site at present.
v) enclose animal by-products during transport, loading/unloading and storage	Tankers collecting blood are enclosed. Vents from these tankers are connected (during loading operations) to the tank headspaces to mitigate any odours through the onsite wet chemical scrubber. Loading and unloading of animal by products occurs currently in the temporary structure to the south of the mat chill 1 room. 2SFG propose to build a permanent enclosed loading bay to the south of the mat chill 1 room for the loading and unloading of animal by products. 2SFG is considered to be compliant.
w) where it is not possible to treat blood before its decomposition starts to cause odour problems and/or quality problems, refrigerate it as quickly as possible and for as short a time as possible, to minimise decomposition	The blood tank is refrigerated. 2SFG is considered to be compliant.
x) export any heat and/or power produced which cannot be used on-site.	Not applicable. Surplus heat and / or power are not generated through the process.
Environmental management systems	
5.1.1.1 BAT is to implement and adhere to an Environmental Management System (EMS) that incorporates, as appropriate to individual circumstances, the following features: • Definition of an environmental policy for the installation by top management (commitment of the top management is regarded as a precondition for a successful application of other features of the EMS). • Planning and establishing the necessary procedures. • Implementation of the procedures, paying particular attention to: ○ structure and responsibility; ○ training, awareness and competence; ○ communication; ○ employee involvement; ○ documentation; ○ efficient process control; ○ maintenance programme;	The site operates under an environmental management system (EMS) aligned to a Group standard which is understood to be in accordance with the international standard ISO 14001. The EMS therefore provides a structured management system for the identification, prioritisation and management of environmental performance and as such should be retained and used as the basis from which to manage and continually improve environmental performance. The site completes weekly monitoring and inspections with bi-annual audits. Employees are trained on the EMS. The EMS uses a Plan, Do, Check and Act model to enable continuous improvement. 2SFG is considered to be compliant.

BAT Requirement	Specific Measures
○ emergency preparedness and response; and ○ safeguarding compliance with environmental legislation. ● checking performance and taking corrective action, paying particular attention to: ○ monitoring and measurement (see also the Reference document on Monitoring of Emissions); ○ corrective and preventive action; ○ maintenance of records; and ○ independent (where practicable) internal auditing in order to determine whether or not the environmental management system conforms to planned arrangements and has been properly implemented and maintained. ● review by top management.	
Integration of same site activities	
5.1.2 For slaughterhouses and/or animal by-products installations, operating on the same site, BAT is to do the following: ● re-use heat and/or power produced in one activity in other activities; and ● share abatement techniques, where these are required, e.g., Wastewater Treatment Plants .	The site undertakes the slaughtering of birds and the processing of animal by products. Four heat exchangers are present on site, including: ● heat exchanger on the foot scalders; ● heat exchanger and steam exchanger in the boiler house which serve the process building (i.e., showers, shackle washes, sterilisers in the breast meat room); ● Heat exchanger in the boiler house which serves 'fast fill'; and ● heat exchangers on the refrigerant plant. The activities on site are connected to two onsite scrubbers used to abate odour on the de-feathering section and also from tank headspaces from waste tanks (i.e., the blood tank). The site benefits from an ETP which treats effluent from across the site. 2SFG is considered to be compliant.
5.1.2 For rendering and incineration on the same site, BAT is to do the following: ● Burn non-condensable gases produced during rendering in a same site incinerator.	Not applicable. Rendering does not occur on site.
5.1.3 BAT is to seek collaboration with upstream and downstream partners, to create a chain of environmental responsibility, to minimise pollution and to protect the environment as a whole on the following subjects: ● Not to feed animals 12 hours prior to slaughter.	There is a period prior to slaughter where birds are not given feed, but this varies based on customer requirements. The time allowed for birds to remain on site for slaughter is 30 mins from the time of arrival.

BAT Requirement	Specific Measures
- Minimise animals time in the slaughterhouse to reduce manure production. - Short and possibly cold storage of animal by products. - Use of fresh refrigerated raw materials. - Use of fresh low volatile nitrogen (TVN) feedstock. - Agreeing a specification with the renderer regarding receipt of material manufactured to the optimal physical characteristics for incineration. - Trimming of all hide / skin not destined for tanning after removal from the animal.	The only by-product 2SFG chill is the blood. This improves its calorific value. 2SFG take in birds (refrigerated raw materials) from other sites where they have been primary processed and then they cut and pack them. This can be up to 200,000 birds per week. All animal by-product waste is categorised before collected and segregated. 2SFG is considered to be compliant.
Installation and equipment cleaning	
5.1.4 For the cleaning of slaughterhouses and animal by-products installations, BAT is to do the following: - Manage and minimise the quantities of water and detergents consumed. - Select those detergents which cause minimum impact on the environment without compromising the efficacy of cleaning. - Avoid, where possible, the use of cleaning and disinfectant agents containing active chlorine. - Where the equipment is suitable, operate a cleaning-in-place system.	2SFG monitor the amount of water used and detergents used in cleaning on a daily basis and minimise these where possible. 2SFG have selected detergents that have a lower impact on the environment and do not comprise active chlorine. The majority of equipment on site is cleaned in place and is fixed in place. 2SFG is considered to be compliant.
5.1.5 Treatment of wastewater For the treatment of wastewater from slaughterhouses and animal by-products installations, BAT is to do the following:	
a) prevent wastewater stagnation	Wastewater stagnation is prevented by utilising the ETP and emptying the balance tank on a continuous basis. 2SFG is considered to be compliant.
b) apply an initial screening of solids using sieves	The ETP comprises a screen that filters out solids above 6mm. 2SFG is considered to be compliant.
c) remove fat from wastewater, using a fat trap	Wastewater goes to ETP where it is treated via dissolved air floatation (DAF) before discharge to sewer. 2SFG is considered to be compliant.

BAT Requirement	Specific Measures
d) use a flotation plant, possibly combined with the use of flocculants, to remove additional solids	The ETP comprises a DAF to remove solids. 2SFG is considered to be compliant.
e) use a wastewater equalisation tank	The ETP comprises a 200m ³ balance tank. 2SFG is considered to be compliant.
f) provide a wastewater holding capacity in excess of routine requirements	The site has a 200 m ³ Effluent Balance Tank which is filled and emptied on a continuous basis during each working day. This capacity is in excess of routine requirements. 2SFG is considered to be compliant.
g) prevent liquid seepage and odour emissions from wastewater treatment tanks, by sealing their sides and bases and either covering them or aerating them.	All tanks at the ETP are sealed and covered. 2SFG is considered to be compliant.
h) subject the effluent to a biological treatment process. Aerobic and anaerobic treatments.	The ETP does not comprise a biological treatment process but is operating within discharge and EP limits. Undertaking biological treatment is not considered necessary.
i) remove nitrogen and phosphorus	Mill flock and ferric sulphate are utilised to remove nitrogen and phosphorus. 2SFG is considered to be compliant.
j) remove the sludges produced and subject them to further animal by-product uses.	Sludges produced at the site are transferred from site and then subject to anaerobic digestion and subsequent recovery of biogas. 2SFG is considered to be compliant.
k) use CH ₄ gas produced during anaerobic treatment for the production of heat and/or power.	Not applicable.
l) subject the resulting effluent to tertiary treatment	The ETP comprises DAF to remove solids, subsequent effluent is discharged to sewer under a discharge consent with Dŵr Cymru/Welsh Water. 2SFG is considered to be compliant.
m) regularly conduct laboratory analyses of the effluent composition and maintain records.	2SFG use NRM laboratories to regularly sample effluent discharged to sewer for Mercury as per the EP and the data is forwarded to NRW as required by the EP.

BAT Requirement	Specific Measures
	Dŵr Cymru/Welsh Water regularly test the effluent for parameters outlined in the trade effluent discharge consent. 2SFG is considered to be compliant.
5.2 Additional BAT for slaughterhouses	
5.2.1 In addition to the general measures, for all slaughterhouses BAT is to do all of the following:	
a) dry scrape delivery vehicles and prior to cleaning with a high-pressure hose.	2SFG dry scrape heavily soiled delivery vehicles prior to jet washing. 2SFG is considered to be compliant.
b) avoid carcase washing and where this is not possible to minimise it, combined with clean slaughter techniques	Washing the carcass is avoided where possible due to a possible contamination risk. 2SFG is considered to be compliant.
c) continuously collect by-products dry and segregated from each other, along the length of the slaughter-line, combined with optimising bleeding and the collection of blood and segregating the storage and handling of different kinds of by-products.	2SFG use feather presses to remove water from the feathers before they tip into bulk trailer for site removal. Other by-products are not collected dry, but the trailers are allowed to drain while they are being filled in the trailer pens to remove excess water. The blood is collected from the blood trough in the factory and piped to a sealed tank, prior to removal from the site by a tanker. The process is controlled by procedure FF002 Blood Handling Procedure. Should the tank ever reach the high or high-high level capacity the Blood Pump will automatically power off. The storage tank is abated via the wet chemical scrubber. Blood is removed from the site every day. There is a road tanker charging and control system with the odorous displaced air from the tanker being abated via the wet chemical scrubber. 2SFG is considered to be compliant.
d) operate a double drain from the bleed hall	Blood from the slaughter process collects in drains and is then pumped to the blood tank. The process is controlled by procedure FF002 Blood Handling Procedure. 2SFG is considered to be compliant.
e) collect floor waste dry	Floor waste is collected dry.

BAT Requirement	Specific Measures
f) remove all unnecessary taps from the slaughter-line	Water is only used where necessary on the slaughter line. 2SFG is considered to be compliant.
g) insulate and cover knife sterilisers combined with sterilising knives using low-pressure steam.	Onsite knife sterilisers are not insulated. Knife sterilisers are constructed of stainless steel to reduce contamination risk.
h) operate hand and apron cleaning cubicles, with a "water off" default.	2SFG operate hand and apron cleaning cubicles, with a "water off" default. 2SFG is considered to be compliant.
i) manage and monitor compressed air use (see Section 4.2.1.19)	The site service engineer completes monitoring checks on compressed air. Compressed air systems are also maintained under contract and inspected as part of pressure systems safety requirements (PSSR). 2SFG is considered to be compliant.
J) manage and monitor ventilation use	Ventilation is maintained under contract. In house engineering monitor that the ventilation is running. 2SFG is considered to be compliant.
K) use backward bowed centrifugal fans in ventilation and refrigeration systems	Backward bowed centrifugal fans are utilised onsite, in the refrigeration systems and in plant room ventilation.
l) manage and monitor the use of hot water.	Hot water is monitored both by engineering and the QA/Technical department monitor temperatures. 2SFG is considered to be compliant.
m) trim all hide/skin material not destined for tanning immediately after removal from the animal, except if there is no outlet for the use/valorisation of the trimmings.	Not applicable.
5.2.2 In addition to the general measures outlined above, for all poultry slaughterhouses, BAT is to do all of the following:	
a) apply dust abatement at bird reception, unloading and hanging stations.	Use of an enclosed system to process the birds (the stunning tunnel) reduces the amount of dust, feather and odour generated. 2SFG is considered to be compliant.
b) stun birds in their modules, using inert gases at new installations and when existing stunning equipment and bird delivery vehicles are due for renewal.	Birds are stunned in their modules. 2SFG is considered to be compliant.

BAT Requirement	Specific Measures
c) reduce water consumption in poultry slaughter, by removing carcase washing equipment from the line except after de-feathering and evisceration.	Water is only used where necessary on the slaughter line. 2SFG is considered to be compliant.
d) steam scald poultry.	Birds are subject to a scald process that uses hot water at a precise temperature and time to loosen the feathers before the bird is fed into the de-feathering machines. A foot scalding is also used to loosen skin on chicken feet prior to entry into the foot de-skinner. 2SFG is considered to be compliant.
e) insulate scalding tanks in those existing premises where it is not yet economically viable to change to steam scalding.	Scalding tanks are not insulated. The scalding tanks are standard industry design and constructed out of stainless steel for hygiene cleaning.
f) use nozzles instead of irrigation pipes to shower poultry, during de-feathering.	Nozzles are used to shower the birds during de-feathering. 2SFG is considered to be compliant.
g) use recycled water, e.g., from the scalding tank, for the carriage of feathers.	Recycled water is utilised to move feathers to the waste storage trailer prior to removal from site. 2SFG is considered to be compliant.
h) use water efficient shower heads to wash poultry, during evisceration.	2SFG do not use shower heads to wash birds. 2SFG use an inside/outside bird wash and birds are also washed in the defeatherators.
i) chill poultry by immersion/spin chilling and to control, regulate and minimise the water consumption.	Birds are not chilled by immersion/spin chilling. An air chill process is used.
5.3 In addition to the general measures in Sections 5.1, for all animal by-products installations, BAT is to do all of the following:	
a) operate continuous, dry and segregated collection of animal by-products throughout animal by-products treatment.	All animal by products are segregated. The animal by products category 3 trailer is not dry but has a grate at the bottom to release effluent to drains and the ETP plant. 2SFG is considered to be compliant.
b) use sealed, storage, handling and charging facilities for animal by-products.	Sealed storage is used for animal by-products with the exception of the animal by products category 3 trailer which is covered in netting.

BAT Requirement	Specific Measures
	The loading bay extension is being constructed to allow for the transfer of animal by product category 3 waste indoors to prevent pests accessing the trailers. A temporary structure is currently in place and being used as a temporary enclosed loading bay. 2SFG is considered to be compliant.
c) where it is not possible to treat animal by-products before their decomposition starts to cause odour problems and/or quality problems, refrigerate them as quickly as possible and for as short a time as possible.	Animal by product category 2 wastes (dead on arrival birds and rejected birds) are refrigerated prior to being removed from site once a day for incineration. Viscera (animal by product category 3) is stored in covered Dolav's with ice and held in the fridge trailer prior to leaving site. The blood tank is refrigerated. 2SFG is considered to be compliant.
d) where inherently malodorous substances are used or are produced during the treatment of animal by-products, pass the low intensity/high volume gases through a biofilter.	Odour from the following are passed through the onsite wet chemical scrubber for abatement: • scald & defeather area; • evisceration area; • blood tank; • screen and solids reception at the ETP; and • tanks at the ETP. Odour from the following are passed through the onsite sludge scrubber for abatement: • sludge tanks; The site is currently undertaking monitoring and assessment of the potential for onsite odour, including assessment of the functionality of the wet chemical scrubber and sludge scrubber (refer 410.064648.00001_ORA). Once this assessment is complete, 2SFG will fully review the findings and consider recommendations where required. 2SFG is considered to be compliant.
In addition to the general measures in Sections 5.1 and 5.3, for blood processing installations BAT is to do one of the following: 1. concentrate plasma, prior to spray drying, using reverse osmosis; 2. concentrate plasma, prior to spray drying, using vacuum evaporation; or 3. remove water from blood, by steam coagulation, prior to spray drying.	Not applicable. Blood is not processed on site.

BAT Requirement	Specific Measures
For bone processing, no additional BAT have been identified in addition to those in Sections 5.1 and 5.3 of the Slaughterhouse and Animal by Industries BREF.	Not applicable. Bones are not processed at the site.
For gelatine manufacturing installations, BAT is to insulate bone de-fatting equipment.	Not applicable. Gelatine not manufactured at the site.
BAT for the incineration of animal by-products	Not applicable. Incineration of animal by products does not occur at the site.
BAT for biogas production.	Not applicable. Biogas is not generated at the site.
BAT for composting.	Not applicable. Composting is not undertaken at the site.

7.2 Draft Slaughterhouses and Animal By-Products Industries BREF - update Issued June 2021

Please see Table 7-2 for assessment of onsite measures against the Draft Slaughterhouse and Animal By-Product Industries BREF that was issued in June 2021 ('the Draft BREF'). Whilst this document has not yet been released as 'final' and is therefore not a requirement to be considered as part of this EP variation application, 2SFG have considered this document in their assessment of best available techniques. This is to inform the direction of travel of environmental management at the site and to identify any requirements for capital expenditure and provide an understanding of future compliance and regulatory risks going forward.

When a new BREF is released, a site has a four-year transition period in which to demonstrate compliance with the best available techniques presented within that BREF.

Table 7-2 DRAFT 2021 Slaughterhouses and Animal By-Products Industries BREF

BAT Requirement	Specific Measures
BAT 1. In order to improve the overall environmental performance, BAT is to elaborate and implement an environmental management system (EMS) that incorporates all of the following features:	The site operates under an environmental management system (EMS) in accordance with the international standard ISO 14001.
i. commitment, leadership, and accountability of the management, including senior management, for the implementation of an effective EMS;	2SFG's environmental policy outlines the commitment of 2SFG to environmental management. The EMS also identifies those who are responsible for leading and implementing the EMS at a senior level. 2SFG are considered to be compliant.
ii. an analysis that includes the determination of the organisation's context, the identification of the needs and expectations of interested parties, the identification of characteristics of the installation that are associated with possible risks for the environment (or human health) as well as of the applicable legal requirements relating to the environment;	The EMS identifies potential environmental risks that may occur at the site and also comprises an assessment of environmental laws that are applicable to the site and have to be adhered to. 2SFG are considered to be compliant.
iii. development of an environmental policy that includes the continuous improvement of the environmental performance of the installation;	iii. The site operates under an environmental policy which includes reference to continual improvement. 2SFG are considered to be compliant.
iv. establishing objectives and performance indicators in relation to significant environmental aspects, including safeguarding compliance with applicable legal requirements;	iv. The site has established objectives and key performance indicators relating to the management of the environment which are recorded in the site's EMS. 2SFG are considered to be compliant.
v. planning, and implementing the necessary procedures and actions (including corrective and preventive actions where needed), to achieve the environmental objectives and avoid environmental risks;	v. The site operates under procedures (i.e., management of hazardous chemicals; management of spillage response plan; emergency preparedness and response; and non-compliance management) to achieve set environmental objectives and avoid environmental risks.

BAT Requirement	Specific Measures
	2SFG are considered to be complaint.
vi. determination of structures, roles and responsibilities in relation to environmental aspects and objectives and provision of the financial and human resources needed;	The site's EMS outlines the roles and responsibilities within the organisation. 2SFG are considered to be complaint.
vii. ensuring the necessary competence and awareness of staff whose work may affect the environmental performance of the installation (e.g., by providing information and training);	2SFG undertakes regular training to allow competency development for all site staff, bespoke content aligned to defined objectives and other prioritised issues. 2SFG also undertakes environmental competency training sessions for the senior management team and key department leads. 2SFG is considered to be compliant.
viii. internal and external communication;	2SFG communicates on environmental topics to internal staff and external stakeholders. 2SFG is considered to be compliant.
ix. fostering employee involvement in good environmental management practices;	2SFG undertakes regular training to allow competency development and engagement for all site staff. 2SFG is considered to be compliant.
x. establishing and maintaining a management manual and written procedures to control activities with significant environmental impact as well as relevant records;	The site operates under an EMS aligned to international standard ISO 14001. The EMS includes a management manual and written procedures to control activities with significant environmental impact as well as relevant records. 2SFG is considered to be compliant.
xi. effective operational planning and process control;	The site operates under an EMS aligned to international standard ISO 14001 which allows for coordination for operational planning and process control of key activities in site (i.e., management of the ETP, boilers, wet chemical scrubber etc). 2SFG is considered to be compliant.
xii. implementation of appropriate maintenance programmes;	2SFG operated a planned preventative maintenance programme. 2SFG is considered to be compliant.
xiii. emergency preparedness and response protocols, including the prevention and/or mitigation of the adverse (environmental) impacts of emergency situations;	Refer Sections 3.13 and 11.5 on emergency response. 2SFG is considered to be compliant.
xiv. when (re)designing a (new) installation or a part thereof, consideration of its environmental impacts	The loading bay extension has been designed to consider environmental impacts throughout its lifecycle and future projects will also be managed in this manner.

BAT Requirement	Specific Measures
throughout its life, which includes construction, maintenance, operation and decommissioning;	2SFG is considered to be compliant.
xv. implementation of a monitoring and measurement programme; if necessary, information can be found in the Reference Report on Monitoring of Emissions to Air and Water from IED Installations;	2SFG operates a monitoring and measurement programme inline with the requirements in their EP. 2SFG is considered to be compliant.
xvi. application of sectoral benchmarking on a regular basis;	2SFG are aware of this requirement in the Draft BREF and will consider it moving forward once the Draft BREF is finalised.
xvii. periodic independent (as far as practicable) internal auditing and periodic independent external auditing in order to assess the environmental performance and to determine whether or not the EMS conforms to planned arrangements and has been properly implemented and maintained;	2SFG had an independent review of compliance against the existing EP undertaken by SLR Consulting in June 2022. 2SFG have an EMS that is in alignment with ISO 14001 and under periodic internal reviews to ensure alignment with this Standard. 2SFG are aware of the requirement in the Draft BREF to schedule regular internal and independent audits. 2SFG is considered to be compliant.
xviii. evaluation of causes of nonconformities, implementation of corrective actions in response to nonconformities, review of the effectiveness of corrective actions, and determination of whether similar nonconformities exist or could potentially occur;	2SFG have procedures in place within the EMS and on how to manage and evaluate non-conformances. 2SFG is considered to be compliant.
xix. periodic review, by senior management, of the EMS and its continuing suitability, adequacy and effectiveness;	The EMS is discussed by senior management on a regular basis including if the EMS and management features are adequate. 2SFG is considered to be compliant.
xx. following and taking into account the development of cleaner techniques.	2SFG consider development of cleaner techniques, however, this is not yet a formalised process. 2SFG are aware of this requirement in the Draft BREF and will consider it moving forward within the transition period once the Draft BREF is finalised.
BAT 2. In order to improve the overall environmental performance, BAT is to establish, maintain and regularly review (including when a significant change occurs) an inventory of water, energy and process chemicals consumption as well as of wastewater and waste gas streams, as part of the environmental management system (see BAT 1)	2SFG monitor and review water, energy and chemical consumption as part of the existing EMS. Monitoring of volumes of wastewater and gas streams is not yet undertaken routinely. A 'consumption and emissions' inventory of water, energy and chemical use and wastewater and waste gas generation has yet to be formalised and be presented in the format required by BAT 2.

BAT Requirement	Specific Measures
	2SFG are aware of this requirement in the Draft BREF and will consider it moving forward within the transition period once the Draft BREF is finalised.
I. Information about the production process(es), including: (a) simplified process flow sheets that show the origin of the emissions; and (b) descriptions of process-integrated techniques and wastewater/waste gas treatment techniques to prevent or reduce emissions, including their performance (e.g., abatement efficiency).	SLR are currently assessing the wet chemical scrubber and sludge scrubber performance on behalf of 2SFG. 2SFG meet some of the requirements on presenting information on production processes and evaluation of performance. However, the inventory would need to be updated once the final BREF is released to formalise performance assessment.
II. Information about energy consumption and usage.	2SFG collate this information currently and can incorporate it into the consumption and emissions inventory once the draft BREF is finalised.
III. Information about water consumption and usage (e.g., flow diagrams and water mass balances).	2SFG collate this information currently and can incorporate it into the consumption and emissions inventory once the draft BREF is finalised.
IV. Information about the quantity and characteristics of the wastewater streams, such as: (c) average values and variability of flow, pH and temperature; (d) average concentration and mass flow values of relevant substances/parameters (e.g., COD/TOC, nitrogen species, phosphorus) and their variability.	2SFG currently monitor wastewater quarterly. 2SFG will assess the monitoring of wastewater within the transition period once the draft BREF is finalised.
V. Information about the characteristics of the waste gas streams, such as: (e) emission point(s) (f) average values and variability of flow and temperature; (g) average concentration and mass flow values of relevant substances/parameters (e.g., dust, TVOC, NOX, SOX) and their variability; (h) presence of other substances that may affect the waste gas treatment system or plant safety (e.g., oxygen, water vapour, dust).	2SFG will assess additional requirements on monitoring of waste gases (above what is required in the EP), in the transition period once the draft BREF is finalised.
VI. information about the quantity and characteristics of the process chemicals used: (a) the identity and the characteristics of process chemicals, including properties with adverse effects on the environment and/or human health; and (b) the quantities of process chemicals used and the location of their use.	2SFG currently collate this information and can incorporate it into the consumption and emissions inventory once the draft BREF is finalised.

BAT Requirement	Specific Measures
BAT 3. In order to improve the overall environmental performance, BAT is to elaborate and implement a chemicals management system (CMS) as part of the EMS (see BAT 1) that incorporates all of the following features: I. A policy to reduce the consumption and risks of process chemicals, including a procurement policy to select less harmful process chemicals and their suppliers with the aim of minimising the use and risks of hazardous substances and avoiding the procurement of an excess amount of process chemicals. The selection of process chemicals may consider: (a) their eliminability, their ecotoxicity and their potential to be released into the environment in order to reduce emissions to the environment; (b) the characterisation of the risks associated with the process chemicals, based on the chemicals' hazards statement, pathways through the plant, potential release and level of exposure; (c) the regular (e.g., annual) analysis of the potential for substitution to identify potentially new available and safer alternatives to the use of hazardous substances (e.g., use of other process chemicals with no or lower environmental impacts, see BAT 11 (a)); (d) the anticipatory monitoring of regulatory changes related to hazardous chemicals and safeguarding compliance with applicable legal requirements.	2SFG currently manage storage and application on site through their EMS. However, as yet 2SFG have not collated a chemicals management system as defined in BAT 3. 2SFG do currently meet some elements of this BAT including consideration within the chemical selection process of low eco-toxic chemicals and assessment of risks associated with process chemical. This process however has not been formalised. 2SFG are aware of this requirement in the Draft BREF and will consider it moving forward as part of their EMS to develop: - Goals and action plans to avoid or reduce the use and risks of hazardous substances. - Development and implementation of procedures for the procurement, handling, storage, and use of process chemicals to prevent or reduce emissions to the environment.
BAT 4. In order to reduce the frequency of the occurrence of 'operations other than normal operating conditions' (OTNOC) and to reduce emissions during OTNOC, BAT is to set up and implement a risk based OTNOC management plan as part of the EMS (see BAT 1) that includes all of the following elements: i. identification of potential OTNOC (e.g., failure of equipment critical to the protection of the environment ('critical equipment')), of their root causes and of their	2SFG currently operate management procedures for the boilers, ETP, wet chemical scrubber and sludge scrubber including management of unexpected outages. These procedures have not yet been formalised into a formal OTNOC management plan as outlined in BAT 4. 2SFG are aware of this requirement in the Draft BREF and will consider it moving forward within the transition period once the Draft BREF is finalised.

BAT Requirement	Specific Measures						
potential consequences, and regular review and update of the list of identified OTNOC following the periodic assessment below; ii. appropriate design of critical equipment (e.g., wastewater treatment plant); iii. set-up and implementation of an inspection and preventive maintenance plan for critical equipment (see BAT 1 xii.); iv. monitoring (i.e., estimating or, where possible, measuring) and recording of emissions during OTNOC and of associated circumstances; v. periodic assessment of the emissions occurring during OTNOC (e.g., frequency of events, duration, amount of pollutants emitted) and implementation of corrective actions if necessary; vi. regular review and update of the list of identified OTNOC under point i. following the periodic assessment of point v; and vii. regular testing of backup systems.							
BAT 5. For wastewater streams identified by the inventory of inputs and outputs (see BAT 2), BAT is to monitor key process parameters (e.g., continuous monitoring of wastewater flow, pH and temperature) at key locations (e.g., the inlet and outlet of the pre-treatment, the inlet to the final treatment, the point where the emission leaves the installation).	2SFG currently monitors emissions to sewer at S1 on a quarterly basis (chemical oxygen demand and effluent flow) and annual basis (mercury) with results reported to the regulator. 2SFG are aware of this requirement in the Draft BREF and will consider it moving forward within the transition period once the Draft BREF is finalised.						
BAT 6. BAT is to monitor at least once per year: - the yearly consumption of water and energy; and - the yearly amount of wastewater generated.	2SFG currently monitor water, energy and wastewater consumption annually. Wastewater is also monitored daily for volume, chemical oxygen demand and solids. BAT is considered to be met.						
BAT 7. BAT is to monitor emissions to water (sewer) with at least the frequency given below and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality. <table border="1"> <thead> <tr> <th>Parameter</th><th>Frequency of Monitoring</th></tr> </thead> <tbody> <tr> <td>Adsorbable organically bound halogens</td><td>3 months</td></tr> <tr> <td>Biochemical oxygen demand (BOD)</td><td>monthly</td></tr> </tbody> </table>	Parameter	Frequency of Monitoring	Adsorbable organically bound halogens	3 months	Biochemical oxygen demand (BOD)	monthly	2SFG currently monitors emissions to sewer at S1 on a quarterly basis (chemical oxygen demand and effluent flow) and annual basis (mercury) with results reported to the regulator. Once the draft BREF is published as final, 2SFG will identify which parameters are applicable to onsite processes and update their monitoring strategy accordingly.
Parameter	Frequency of Monitoring						
Adsorbable organically bound halogens	3 months						
Biochemical oxygen demand (BOD)	monthly						

BAT Requirement		Specific Measures
Chemical oxygen demand (COD)	weekly	
Total nitrogen	weekly	
Total organic carbon	weekly	
Total phosphorous	weekly	
Total suspended solids (TSS)	Weekly	
Copper	6 months	
Zinc	6 months	
Chloride	monthly	
AT 8. BAT is to monitor channelled emissions to air with at least the frequency given below and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality. For NO_x, SO₂, CO and odour concentration, the monitoring frequency is annually.		Channelled emission points to air are listed below: - Boiler Flue 1 – NO_x, SO₂ and CO emissions. - Boiler Flue 2 – NO_x, SO₂ and CO emissions. - Wet chemical scrubber – odour emissions. - Sludge scrubber – odour emissions. 2SFG are liaising with a subcontractor to incorporate annual monitoring into the servicing contract for NO_x, SO₂, CO and odour concentration. 2SFG are considered to be compliant
BAT 9. In order to increase energy efficiency, BAT is to use technique (a) and an appropriate combination of the general energy-saving techniques listed in technique (b) below: - energy efficiency plan and energy audits; and - use of general energy-saving techniques.		Sites participate under the energy savings opportunity scheme (ESOS) scheme and employ a range of energy saving techniques at the site (refer Tables 7-1 above). 2SFG are considered to be compliant.
BAT 10. In order to reduce water consumption and the amount of wastewater generated, BAT is to use techniques (a) and (b) and one or a combination of the techniques (c) to (k) given below. a) water management plan and water audits; b) segregation of water streams; c) water recycling and/or reuse; d) optimisation of water flow; and e) use and optimisation of water nozzles and hoses. Techniques relating to cleaning operations f) dry cleaning;		Refer to assessment of the current Slaughterhouses and Animal By-Products BREF (dated 2005) above. 2SFG are considered to be compliant.

BAT Requirement	Specific Measures
g) high-pressure cleaning; h) optimisation of chemical dosing and water use in cleaning in-place (CIP); i) low-pressure foam and/or gel cleaning; j) optimised design and construction of equipment and process areas; and k) cleaning of equipment as soon as possible.	
BAT 11. In order to prevent or, where that is not practicable, to reduce the use of harmful substances, e.g., in cleaning and disinfection, BAT is to use one or a combination of the techniques given below - proper selection of cleaning chemicals and/or disinfectants; - reuse of cleaning chemicals in cleaning-in-place (CIP); - dry cleaning; and - optimised design and construction of equipment and process areas.	2SFG undertake proper selection of cleaning chemicals and/or disinfectant to minimise the potential impact on the environment. Process areas and the drainage system are also designed to direct effluent the ETP for treatment prior to discharge to sewer. 2SFG are considered to be compliant.
BAT 12. In order to increase resource efficiency, BAT is to use one or a combination of the techniques given below. anaerobic digestion; - prevention of biological degradation of animal by-products and/or edible coproducts; - recycling/recovery of separated residues; - use of animal fat as a fuel; and - phosphorus recovery as struvite.	a) 2SFG recover sludge generated from the ETP and transfer it offsite for anaerobic digestion. b) Animal by-products are stored in closed vessels for as short a time as possible, before being transferred offsite for further treatment. Waste blood is refrigerated. c) Waste is segregated on site and cardboard; plastic and metal are transferred off site for recycling. 2SFG is considered to be compliant.
BAT 13. In order to prevent uncontrolled emissions to water, BAT is to provide an appropriate buffer storage capacity for generated wastewater.	The site has a 200m³ Effluent Balance Tank which is filled and emptied on a continuous basis during each working day. This capacity is in excess of routine requirements. 2SFG is considered to be compliant.
BAT 14. In order to reduce emissions to water, BAT is to use an appropriate combination of the techniques given below: a) equalisation; b) neutralisation; c) physical separation, e.g. screens, sieves, grit separators, fat separators, or primary settlement tanks; d) precipitation; e) evaporation;	Wastewater goes to ETP where it is treated via neutralisation (adjustment of pH) and dissolved air floatation (DAF) before discharge to sewer. 2SFG is considered to be compliant.

BAT Requirement	Specific Measures
f) chemical oxidation with ozone; g) aerobic and/or anaerobic treatment (secondary treatment), e.g. activated sludge process, aerobic lagoon, anaerobic contact process, membrane bioreactor; h) nitrification and/or denitrification; Phosphorous Removal i) precipitation; j) enhanced biological phosphorus removal; Final Solids Removal k) coagulation and flocculation; l) sedimentation; m) Filtration (e.g. sand filtration, microfiltration, ultrafiltration); and n) flotation.	
BAT 15. In order to reduce emissions to air of CO, dust, NOX and SOX from the combustion of malodorous gases (e.g., in thermal oxidisers or steam boilers) including non-condensable gases, BAT is to pre-treat the waste gases using technique (a) when necessary, and to use one or a combination of techniques (b) to (d) given below. • removal of high levels of dust, NOX and SOX precursors; • fuel choice; • low-NOX burner; and • optimised thermal oxidation.	Once the Draft BREF is released as final, within the four-year transition period, 2SFG will assess this BAT to assess which strategy to reduce emissions from the steam boilers is applicable to 2SFG.
BAT 16. In order to prevent or, where that is not practicable, to reduce noise emissions, BAT is to set up, implement and regularly review a noise management plan, as part of the environmental management system (see BAT 1), that includes all of the following elements: • a protocol containing actions and timelines; • a protocol for conducting noise emissions monitoring; • a protocol for response to identified noise events, e.g., complaints; and • a noise reduction programme designed to identify the source(s), to measure/estimate noise, to characterise the contributions of the sources and to implement prevention and/or reduction measures.	A noise management plan has been submitted as part of this application (410.064648.00001_NMP) which addresses the requirements of BAT 16, with the exception of a protocol listing actions and timelines on noise management which is held within the site's EMS. 2SFG is considered to be compliant.

BAT Requirement	Specific Measures
BAT 17. In order to prevent or, where that is not practicable, to reduce noise emissions, BAT is to use one or a combination of the techniques given below. appropriate location of equipment and buildings; - operational measures; - low-noise equipment; - noise control equipment; and - noise abatement.	Due to noise complaints from neighbours, a noise risk assessment (NRA) was undertaken in 2021 by SLR which recommended an acoustic barrier be erected to mitigate noise. It is understood that local residents objected to this on a visual basis. A noise management plan has been prepared for the site (410.064648.00001_BATOT). Once the Draft BREF is released as final, within the four-year transition period, 2SFG ensure that the site is compliant with BAT 17.
BAT 18. In order to prevent or, where that is not practicable, to reduce odour emissions, BAT is to set up, implement and regularly review an odour management plan, as part of the environmental management system (see BAT 1), that includes all of the following elements: - a protocol containing actions and timelines; - a protocol for conducting odour monitoring. It may be complemented by measurement/estimation of odour exposure or estimation of odour impact; - a protocol for response to identified odour incidents, e.g., complaints; and - an odour prevention and reduction programme designed to identify the source(s); to measure/estimate odour exposure; to characterise the contributions of the sources; and to implement prevention and/or reduction measures.	2SFG are currently undertaking assessment and monitoring of their odour emissions. The onsite odour management plan is scheduled to be updated at the end of these works. Once the Draft BREF is released as final, within the four-year transition period, 2SFG will ensure that the site is compliant with BAT 18.
BAT 19. In order to prevent or, where that is not practicable, to reduce odour emissions, BAT is to use all of the techniques given below. a) Regular cleaning of installations and equipment; b) Cleaning and disinfection of vehicles and equipment used to transport and deliver animal by products and/or edible co product. c) Enclose animal by-products and/or edible co-products during transport, loading/unloading and storage. d) Prevention of biological degradation of animal by products and/or edible co products.	2SFG undertakes regular cleaning in process and waste storage areas at the site. Vehicles that deliver poultry are cleaned and disinfected after each delivery. Vehicles that are used to transport animal by products are cleaned after delivery takes place. The new loading bay provides an enclosed loading area for animal by products. Blood is refrigerated prior to being transferred offsite. 2SFG is considered to be compliant.
BAT 20. In order to increase energy efficiency, BAT is to use an appropriate combination of the techniques specified in BAT 9 and of the techniques given below.	Refrigeration management systems on site are managed by the site service manager and also third-party contractors.

BAT Requirement	Specific Measures
• refrigeration management plan - part of the environmental management system (see BAT 1) and entails: ○ monitoring of energy consumption; ○ operational measures such as inspection and maintenance of equipment, closing of doors when possible; equipment operation by experienced staff; and ○ monitoring of refrigerants consumption and leaks. • steam scalding; and • jet stream scalding.	2SFG is considered to be compliant.
BAT 21. In order to reduce water consumption and the amount of wastewater generated, BAT is to use an appropriate combination of the techniques specified in BAT 10 and of the techniques given below. ○ dry emptying of stomachs; ○ dry collection of the contents of intestines; and ○ steam scalding.	Once the Draft BREF is released, 2SFG will ensure that within the transition period that water consumption at the site is managed in accordance with BAT 21.
BAT 22. In order to prevent emissions of ozone-depleting substances and of substances with a high global warming potential from cooling and freezing, BAT is to use refrigerants without ozone depletion potential and with a low global warming potential.	Refer to Section 4.3 for refrigerants utilised on site. Once the Draft BREF is released, 2SFG will ensure that within the transition period that a review of the refrigerants utilised on site is undertaken and that compliance with BAT 22 is met in the selection of new refrigerants.
BAT 23. In order to prevent or, where that is not practicable, to reduce refrigerant losses, BAT is to use one or a combination of the techniques given below. • refrigeration management plan; • preventative and corrective maintenance; and • use of refrigerant leak detectors.	2SFG use preventative and corrective maintenance to manage the refrigeration systems. 2SFG is considered to be compliant.
BAT conclusions for installations processing animal by-products and/or edible co-products	
BAT 24. In order to increase energy efficiency, BAT is to use an appropriate combination of the techniques specified in BAT 9 and of the technique given below	Not applicable. 2SFG does not process animal by products on site.
BAT 25. BAT outlines the techniques to use In order to reduce emissions to air of organic compounds and malodorous compounds.	Not applicable 2SFG does not process animal by products on site.

7.3 Industrial Cooling Systems BREF

Refer Table 7-3 for assessment of onsite measures against the Industrial Cooling System BREF.

Table 7-3 Assessment of Measures Against Industrial Cooling BREF

BAT Ref.	Indicative BAT requirement	Compliance level
4.2.1.1 Industrial cooling = Heat management	BAT for all installations is an integrated approach to reduce the environmental impact of industrial cooling systems maintaining the balance between both the direct and indirect impacts. In other words, the effect of an emission reduction has to be balanced against the potential change in the overall energy efficiency. Both impacts, direct and indirect, need to be balanced, taking into account all variables. Every change in the cooling system has to be considered against the consequences it may have for this balance.	Cooling management onsite is carefully considered and equipment is operated to ensure maximum efficiency whilst reducing emissions. 2SFG is considered to be compliant.
4.2.1.2 Reduction of the level of heat discharge by optimization of internal/external heat reuse	A preventive approach should start with the industrial process requiring heat dissipation and aim to reduce the need for heat discharge in the first place. The discharge of heat is wasting energy and as such not BAT. Reuse of heat within the process should always be a first step in the evaluation of cooling needs.	Heat recovery is undertaken on fridge plant through plate heat exchangers to pre-heat factory hot water through a closed loop system. 2SFG is considered to be compliant.
4.2.1.3 Cooling system and process requirements	The selection of a cooling configuration should be based on a comparison between the different feasible alternatives within all requirements of the process. Process requirements are for example control of chemical reactions, reliability of process performance and maintenance of required safety levels. A change in cooling technology to reduce the environmental impact can only be considered BAT if the efficiency of cooling is maintained at the same level or, even better, at an increased level. Table 4.1 provided examples of process requirements and BAT.	Cooling systems on site (refer Section 3.3) were chosen after to comparison to alternative equipment. Any further changes to cooling technology will also comprise an assessment to ensure that a reduction in environmental impact is only considered if the efficiency of cooling is maintained at the same level or, even better, at an increased level. 2SFG is considered to be compliant.

BAT Ref.	Indicative BAT requirement	Compliance level
4.2.1.4 Cooling system and site requirements	The site-imposed limits apply particularly to new installations, where a cooling system must still be selected. If the required heat discharge capacity is known, it may influence the selection of an appropriate site. For temperature-sensitive processes it is BAT to select the site with the required availability of cooling water	When required, cooling systems are chosen based on the site-specific characteristics of the location. There are no plans to install any new cooling systems as part of this EP variation. 2SFG is considered to be compliant.
4.3 Reduction of energy consumption	Examples of BAT in the design phase of a cooling system: - To reduce resistance to water and airflow. - To apply high efficiency/low energy equipment. - To reduce the amount of energy demanding equipment (Annex XI.8.1). - To apply optimised cooling water treatment in once-through systems and wet cooling towers to keep surfaces clean and avoid scaling, fouling and corrosion.	2SFG will give consideration to BAT 4.3 when designing cooling systems in future. 2SFG is considered to be compliant.
4.3.2 Identified reduction techniques within the BAT-approach	Table 4.3, BAT for increasing overall energy efficiency: Large cooling capacity: overall energy efficiency - select site for once-through option. All systems: overall energy efficiency - apply option for operation (identifying required cooling range). for variable operation modulate air/water flow to avoid instability cavitation in systems (corrosion & erosion). Wet systems: clean circuit/exchanger surfaces via optimised water treatment and pipe surface treatment. Once through systems: maintain cooling efficiency (avoid recirculation of warm water plume in rivers and minimise it in estuaries and on marine sites). For cooling towers: reduce specific energy consumption – apply pumping heads and fans with reduced energy consumption.	Cooling systems on site comprise a closed loop recirculating system that is topped up periodically with mains water. Cooling systems are subject to regular PPM which will include cleaning where required. Corrosion inhibitors are be used to treat water in the cooling systems. No cooling water is discharged to surface water. The site does not include a once through cooling system. Ancillary equipment to the cooling tower is assessed where appropriate and reduced energy equipment installed. 2SFG is considered to be compliant.
4.4.2 Identified reduction techniques within the BAT-approach	Table 4.4: BAT for reduction of water requirements: All wet cooling systems: - Reduction of need for cooling through optimisation of heat reuse. - Reduction of use of limited resources (use of groundwater is not BAT). - Reduction of water use – apply recirculating systems.	The recirculating cooling system re-uses heat where possible. Heat recovery is undertaken on fridge plant through plate heat exchangers to pre- heat factory hot water through a closed loop system. Mains water is used to top up the closed system when required, not groundwater.

BAT Ref.	Indicative BAT requirement	Compliance level
	- Where make-up water is not available during process period or very limited, apply dry cooling. All recirculating wet and wet/dry cooling systems: - Reduce water use – optimisation of cycles of concentration.	Make up water is from the mains so is readily available. The water treatment process requires regular testing to ensure it is balanced correctly. A company called HSL undertake this testing. 2SFG is considered to be compliant.
4.5.2 Identified reduction techniques within the BAT-approach	All once-through systems or cooling systems with intakes of surface water: - Appropriate design and position of water intake and selection of protection technique. - Construction of intake channels.	Not applicable - closed loop system topped up with mains water.
4.6.1 General BAT approach to reduce heat emissions	BAT relates to heat emissions into the surface water, the environmental impact of which will strongly depend on the local conditions.	Not applicable - no releases to surface water
4.6.2 General BAT approach to reduce chemical emissions to water	For existing systems focus should be on the operation of the systems using monitoring linked to optimized dosage. Selecting cooling water additives less harmful to the aquatic environment and to applying them in the most efficient way (this BREF consists of a tool that can assist in a first ranking of selected chemicals and of an approach to assess biocides, linking the requirements of the cooling system to requirements of the receiving aquatic ecosystem (Annex VIII)). The same applies to the use of biocides for conditioning of recirculating systems. Treatments for these systems are often multi-substances. Some components or substances can be identified as not BAT or should not be applied at all. A general approach to select the appropriate biocide will include local aspects, such as the water quality objectives of the receiving surface water.	The cooling system is monitored to optimise the use of dosing chemicals. The cooling system does not discharge to surface water or the aquatic environment. 2SFG is considered to be compliant.
4.6.3.1 Prevention by design and maintenance	Table 4.6: BAT for reduction of emissions to water by design and maintenance techniques: All wet cooling systems: - Apply less corrosion-sensitive material - Reduction of fouling and corrosion. Design cooling system to avoid stagnant zones. Shell & tube heat exchanger: - Design to facilitate cleaning Condensers and heat exchangers: - Reduce deposition (fouling) in condensers (Water velocity > 1.8 m/s for new	When new cooling systems are installed, they will include consideration of the design techniques in Section 4.6.3.1 of the BREF note. Condensers and heat exchangers are operated as per their manufacturers specifications to avoid deposition and clogging. This equipment and cooling systems are also subject to PPM. The site does not include once-through cooling systems, therefore BAT for these systems has not been considered.

BAT Ref.	Indicative BAT requirement	Compliance level
	equipment and 1.5 m/s in case of tube bundle retrofit) • Reduce deposition (fouling) in heat exchanger (Water velocity > 0.8 m/s) • Avoid clogging - use debris filters to protect the heat exchangers where clogging is a risk. Once-through cooling system: • Reduce corrosion sensitiveness -apply carbon steel in cooling water systems if corrosion allowance can be met. • Reduce corrosion sensitiveness - Apply reinforced glass fibre plastics, coated reinforced concrete or coated carbon steel in case of underground conduits • Reduce corrosion sensitiveness - Apply Titanium for tubes of shell & tube heat exchanger in highly corrosive environment or high-quality stainless steel with similar performance.	2SFG is considered to be compliant.
4.6.3.2 Control by optimised cooling water treatment	Table 4.7, BAT for reduction of emissions to water by optimised cooling water treatment: All wet systems: • Reduce additive application by monitoring and control of cooling water chemistry. • Use of less hazardous chemicals (it is not BAT to use chromium, mercury, organometallic compounds, mercaptobenzothiazole, or shock treatment with biocidal substances other than chlorine, bromine, ozone and H₂O₂).	Water chemistry is monitored within the cooling system to allow for calculation of the most efficient dose of chemicals to use. Bromine is used to dose the condensers. 2SFG is considered to be compliant.
4.7 Reduction of emissions to air	Reduction of emissions to air from cooling towers. Table 4.8: BAT for reduction of emissions to water by optimised cooling water treatment	The stack height of the cooling tower prevents the plume reaching ground level. The cooling tower is not constructed from asbestos. The cooling tower is placed away from air handling units etc to avoid intake of air. The unit comprises drift eliminators. 2SFG is considered to be compliant.
4.8 Reduction of noise emissions	Table 4.8: BAT for reduction of emissions to air relates to wet cooling towers.	The cooling tower is operated within the manufacturers recommended limits and part of the onsite preventative maintenance scheme – with parts replaced prior to having chance to give rise to vibration. 2SFG is considered to be compliant.

BAT Ref.	Indicative BAT requirement	Compliance level
4.9.1 General approach	To reduce the risk of leakage, attention must be paid to the design of the heat exchanger, the hazardousness of the process substances and the cooling configuration. The following general measures to reduce the occurrence of leakages can be applied: • select material for equipment of wet cooling systems according to the applied water quality. • operate the system according to its design. • if cooling water treatment is needed, select the right cooling water treatment programme. • monitor leakage in cooling water discharge in recirculating wet cooling systems by analysing the blowdown.	The cooling system is maintained under the site's PPM and is operated according to manufacturer instructions. Third party contractors are also utilised for servicing the equipment. The cooling systems are regularly visually inspected for leaks and assessment of blowdown is undertaken. 2SFG is considered to be compliant.
4.9.2 Identified reduction techniques within the BAT-approach	Table 4.10: BAT to reduce the risk of leakage: • avoid small cracks - ΔT overheater of $\leq 50^\circ\text{C}$ (Technical solution for higher ΔT on case-by-case basis). Shell & tube heat exchanger: • Operate within design limits via monitoring process operation. • Strength of tube/tube plate construction – apply welding technology, where applicable. Equipment: • Reduce corrosion - T of metal on cooling water side $< 60^\circ\text{C}$. Recirculating cooling systems: • Cooling of dangerous substances - Constant monitoring of blowdown.	The equipment is regularly visually inspected including monitoring of blowdown and subject to PPM. Cooling systems are operated in line with the manufacturer's specification. 2SFG is considered to be compliant.
4.10.2 Identified reduction techniques within the BAT-approach	All wet recirculating cooling systems: • Reduce algae formation by reducing light energy reaching the cooling water. • Reduce biological growth - avoid stagnant zones (design) and apply optimized chemical treatment • Cleaning after outbreak (a combination of mechanical and chemical cleaning). • Control of pathogens - Periodic monitoring of pathogens in the cooling systems.	Chemicals are added to reduce biological growth in the cooling systems. A third party regularly analyses the systems for pathogens. Should an outbreak of biological growth or pathogens be identified then cleaning is undertaken. 2SFG is considered to be compliant.

8.0 Emissions

8.1 Channelled Emission Points and Fugitive Emissions to Atmosphere

Channelled emission points to air at the site include two steam boilers, one wet chemical scrubber and one sludge scrubber. The boilers are fired on light fuel oil, with a rated thermal input of 4.6MWth each. Each boiler discharges to air via an exhaust stack located to the north of the boiler house. There are also three vents (fugitive emissions) which serve the slaughter area.

Odour has been considered separately within this application, as described in the Non-Technical Summary and supporting Odour Monitoring Report (410.064648.00001_ORA) for the site. The location of the existing emission points to atmosphere are presented on Drawing 003.

Table 8-1 Point Source Emissions to Air

Equipment	Emission Point to Air	Heat/Fuel Source	Type of Emissions	Emission Reference on Drawing 003	Point Incorporated into the current EP?
Boiler 1 Flue	Stack	Light Fuel Oil	NOx, SO ₂ , CO	A1	Yes, with no monitoring requirements
Boiler 2 Flue	Stack	Light Fuel Oil	NOx, SO, CO	A2	Yes, with no monitoring requirements
Chemical scrubber	Stack	Abatement	Odour	Main Scrubber Outlet	No
Sludge scrubber	Stack	Abatement	Odour	Main Scrubber Outlet	No

8.1.1 Medium Combustion Plant Directive

The Medium Combustion Plant Directive (MCPD²) was incorporated into UK law in early 2018 via the Environmental Permitting (England and Wales) (amendment) Regulations (EPR) 2018.

The MCPD, as set out in Schedule 25A of the EPR 2018 amendment, defines the scope, definitions, exclusions and how the regulations apply to types of medium combustion plant (MCP), MCP being combustion plant with a rated thermal input of 1 – 50MWth regardless of the type of fuel used.

Due to the combined rated thermal input of 9.2MWth for the two steam boilers being between >1MWth and <50MWth; they fall under the remit of the MCPD. The steam boilers were installed prior to the first EP being issued in 2005, as such they are considered to be 'existing' MCP as they were installed before December 2018.

Due to the age and size of the steam boilers they need to be incorporated into the varied EP as listed activities prior to 01 January 2024. Emission limits and monitoring will only apply from 01 January 2025.

² EU Directive 2015/2193 of the European Parliament and of the Council of 25 November 2015 on the limitation of emissions of certain pollutants into the air from medium combustion plants. [EUR-Lex - 32015L2193 - EN - EUR-Lex \(europa.eu\)](#)

8.2 Point Source and Fugitive Emissions to Water

8.2.1 Groundwater

There are no point source emissions to groundwater. The site benefits from impermeable surfacing with a sealed drainage system.

SLR have undertaken an assessment of containment at the Sandycroft site. The findings of this review are being consolidated. If there are recommendations within the assessment report to improve containment in areas that may potentially impact groundwater at the site, then 2SFG will incorporate this into an improvement plan.

8.2.2 Surface Water

The only discharges to surface water is clean and uncontaminated rainwater collected from building roofs. Surface water passes through interceptors W1 and W2 prior to leaving site. These interceptors are inspected weekly to confirm that no visible fats, oils and greases are present as per the EP requirements.

A further two interceptors are located in the drainage system, one adjacent to the northwest of the Despatch unit and a petrol interceptor located adjacent to the northwest of the ETP.

SLR have undertaken an assessment of containment at the Sandycroft site. The findings of this review are being consolidated. If there are recommendations within the assessment report to improve containment in areas that may potentially impact surface water, then 2SFG will incorporate this into an improvement plan.

8.2.3 Point Source Emissions to Sewer

Treated effluent is discharged to the sewage drainage system at S1 under a trade effluent discharge consent issued by Dŵr Cymru/Welsh Water.

The site monitors effluent at S1 on a quarterly (chemical oxygen demand and effluent flow) and annual basis (mercury) with results reported to NRW. Appendix B presents the sewer discharge consent limits for the Dŵr Cymru/Welsh Water discharge consent. Dŵr Cymru/Welsh Water monitor S1 frequently to monitor compliance.

8.3 Odour

The site has developed an odour management plan as required by Improvement Condition 13 of EP V002. The OMP was last reviewed on 21 May 2021. Overall, there has been a reduction in the odours generated and correspondingly the numbers of complaints received.

SLR have undertaken monitoring of odour generated at the site and investigated the effectiveness of the wet chemical scrubber and sludge scrubber. Results are provided in 410.064648.00001_ORA. The findings of monitoring indicate that some remedial action (i.e., increasing flow rates to the wet chemical scrubber) and further modelling may be required. In early 2023, 2SFG will consider the report outcomes and determine a way forward.

8.4 Point Source Emissions to Land

There are no point source emissions to land from activities on site.

8.5 Fugitive Emissions

Significant fugitive emissions from the site are considered to be unlikely:

- birds are processed through stun tunnels to reduce dust emissions;

- loading of animal by products is undertaken indoors (currently via the temporary igloo and soon to be via the loading bay extension);
- products are chilled immediately; and
- refrigeration plant on site are maintained by appointed specialist contractors.

2SFG maintains spill procedures and operating personnel are provided with training in the implementation of the spill procedures. Regular inspections of surfacing at the site are undertaken in accordance with the site's environmental management system and maintenance procedures. SLR have undertaken an assessment of containment at the Sandycroft site. 2SFG are aiming to review the containment assessment in 2023 and will put an improvement plan in place where this is considered to be required.

8.6 Noise and Vibration

Due to noise complaints from neighbours, a noise risk assessment (NRA) was undertaken in 2021 by SLR which recommended an acoustic barrier be erected to mitigate noise. It is understood that local residents objected to this on a visual basis. A Noise Management Plan has been prepared and is presented as 410.064648.00001_NMP as part of this application.

8.7 Pests

Uncovered waste animal by product category 3 trailers are currently loaded in a temporary structure. This prevents pests (i.e., seagulls) from accessing the trailers during the onloading process. This process is temporary until the loading bay extension is complete (refer Section 4.1).

2SFG has pest management arrangements in place at the facility, this includes a contract with an appointed pest control company who regularly visits the site to ensure pest control is adequate.

9.0 Monitoring

Monitoring is conducted as required by the EP and is submitted to NRW. Site maintain records of all monitoring results on the eSis system.

9.1 Point Source Emissions to Air

The emission point to air from the wet chemical scrubber and sludge scrubber are not listed in the current EP variation and have no monitoring requirements set. No monitoring requirements are present in the EP for emission points A1 and A2.

9.1.1 Medium Combustion Plant Directive

Combustion emissions from the two light fuel fired steam boilers will be required to meet the following MCPD emission limit values (ELV) as stated in as stated in Table 1, Part 1 of Annex II of the MCPD:

- nitrogen oxides (NO_x) for combustion plant with a rated thermal input equal to or greater than 1MWth and equal to or less than 5MWth of **250mg/m³** (there are no ELVs for SO_x and dust for such plant), **from 1st January 2030**.

9.2 Point Source Emissions to Sewer

Site monitors emissions to sewer at S1 on a quarterly (chemical oxygen demand and effluent flow) and annual basis (mercury) with results reported to the regulator. No breaches of mercury annual limits have been

recorded. Dŵr Cymru / Welsh Water regularly visits site to take samples of the site's effluent. No issues have been raised by the sewerage undertaker.

9.3 Point Source Emissions to Surface Water

Emission points to surface water (W1 and W2) are listed in the EP with no monitoring requirements set.

10.0 Resource Efficiency

10.1 Raw Material Consumption

Raw materials used on site are detailed in Table 10-1. Most finished product goes out in reusable crates. Some customers require the packs in cardboard.

Table 10-1 Raw Materials

Raw material	Estimated Annual Consumption
Birds	64,624 tonnes
Packaging Trays	80-90 pallets
Packaging cardboard	20-25 pallets
Top film for trays	8-10 pallets

10.2 Energy Efficiency

2SFG has participated in the Energy Saving Obligation Scheme (ESOS) which identified numerous energy efficiency measures which have now been implemented by site.

An annual energy consumption report is compiled and submitted to NRW. Heat is redistributed onsite in the heat recovery systems present in the refrigeration systems and the additional heat exchangers on site (foot scalders and two heat exchangers in the boiler house).

10.3 Water Minimisation

The estimated yearly water usage at the site is 430,000 m³. To minimise water consumption:

- Manual cleaning is undertaken. This involves the use of pressurised nozzle hoses and steam cleaning equipment.
- Use of hot water and specialist detergent to improve cleaning efficiencies.

In addition, 2SFG, in accordance with the EMS, regularly reviews the site's water usage using data obtained from water meters on site.

10.4 Waste Minimisation

Wastes arising at the site are handled, managed and disposed of in accordance with site procedures. 2SFG, in accordance with the EMS, regularly reviews the site's waste generation using data obtained from the appointed

waste contractors, and periodically undertakes a review of waste generation to identify potential waste minimisation opportunities.

Waste targets are reviewed monthly. There has been a reduction in waste sent to landfill.

11.0 Environmental Management System

The site operates under an environmental management system (EMS) which is understood to be aligned to the international standard ISO 14001.

11.1 Policy

2SFG has developed an Environmental Policy. The Policy is displayed on notice boards at the site and is included in the EMS Manual.

The policy has been signed by the organisation's Executive Chairman. The Environmental Policy clearly defines the organisation's commitment to ensure that the impact of business activities upon the environment is kept to a minimum, ensure legal compliance, minimise releases to air, land and water and the amount of generated waste, environmentally friendly management of resources and for continuous improvement. The Policy is reviewed at least annually at the Management Review meeting. The policy addresses specific site environmental issues by providing a framework for setting and reviewing environmental objectives and targets.

11.2 Organisation

2SFG has established and maintains documented procedures for identifying and recording environmental aspects for all its activities, products and services. Where significant, the environmental aspects have been considered in the development, implementation and maintenance of the EMS. These are also considered when introducing new or modified activities, products and services. 2SFG has also documented in the EMS the procedure for the setting and managing of environmental Objectives and Targets and developed a Schedule of Objectives and Targets.

2SFG has documented within the EMS the structure and responsibility within the organisation. Senior management have overall responsibility for the provision and maintenance of an effective EMS Policy and improvement programme and will ensure that the requirements of the EMS are addressed in all management and business decisions.

2SFG has established a procedure for periodic internal audits of environmental documents, procedures, implementation and compliance status to determine whether the EMS conforms to planned arrangements, and to determine whether it has been appropriately implemented and maintained in accordance with its Environmental Policy.

11.3 Operations and Maintenance

11.3.1 Operational Control

2SFG implements a range of operational controls to minimise the impact on the environment. The environmental impact of the site's activities is minimised by:

- the choice and control of material inputs;
- minimising raw material, energy and water usage; and
- maintaining the site in accordance a planned preventative maintenance programme.

Operational controls implemented at site are maintained within the management system. Operational control procedures have been established to ensure that activities and operations are undertaken to ensure environmental performance is achieved in line with the Environmental Policy.

11.3.2 Preventative Maintenance

2SFG has a preventative maintenance programme to ensure the continued integrity of pollution prevention systems. A computerised system generates PPM instructions to the maintenance personnel. Maintenance requirements are based upon maintenance manuals, manufacturer's handbooks, statutory requirements, environment, health & safety requirements, and site processes and procedures.

11.4 Competence and Training

2SFG has established a Training Development Policy for ensuring that the training needs of all employees, including those whose activities may affect the environment, are identified and that the necessary knowledge and skills are provided through appropriate education, training and experience. Training needs are identified primarily by line management but may be identified as a consequence of monitoring/inspections/audits. The organisation has a dedicated Training Department which ensures that staff are provided with the required training requirements and refresher courses.

An induction programme provides all new recruits and, if appropriate, contractors with basic environmental awareness. Additional, on-the-job training and more specialist formal training is provided as required.

11.5 Accidents, Incidents and Non-Conformance

2SFG has established and maintains documented procedures for the management of environmental incidents and accidents that may arise. The facility has implemented the following procedures:

- Emergency Preparedness and Response, this clearly documents the emergency response to be implemented in the event of significant pollution incident. This plan includes details of emergency services, contact numbers for key site personnel and guidance on when external emergency services/agencies should be alerted; and
- Spillage Response Plan. This indicates the areas of the site where there is bulk storage of materials and available spill kits, includes contact (telephone) details for key senior personnel and the emergency services to be contacted in the event of a spillage and the actions to be taken in the event of a spillage to minimise the risk of environmental damage.

2SFG also maintains systems to ensure non-conformances are investigated and that actions are taken to correct and prevent the causes. Systems are in place for investigating and managing all environmental corrective and preventative actions. Accidents, incidents and non-conformances are reported and tracked using the Hazard/Near Miss/Incident Report Form which must be completed for all accidents, incidents and non-conformances. This form requires details of the occurrence, witness statements, photographs, details of the action/s to be taken to avoid reoccurrence, the individual responsible for completing this action and date of completion.

APPENDIX A SANDYCROFT DRAINAGE PLAN

APPENDIX B: WELSH WATER DISCHARGE CONSENT

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