Section 5 supporting information index

Operating standards, technical standards/in-process controls

SUPPORTING INFORMATION – SECTION 5

5 IN-PROCESS CONTROLS

5.1 A. Operating Standards, Technical Standards/In-Process Controls

Introduction

This application relates to a new feed mill to be constructed on the Dalton Airfield Industrial Estate North Yorkshire to be operated by I'Anson Bros Ltd at the site, which is hereafter referred to as "the installation". The activities undertaken at the installation include the "treating and processing of vegetable raw materials intended for the production of food products with a finished product production capacity of more than 300 tonnes per day". This activity constitutes the PPC listed activity at the site.

The Dalton compound mill installation will be capable of producing 400,000 tonnes when it has been fully developed. The site produces compound animal feeds, i.e. feeds which are suitable for consumption by an animal without further processing. The products manufactured are based upon a core recipe of cereals (such as wheat and barley) and other natural ingredients (such as soya, rapeseed, and sugar beet), which are mixed with supplements, processed, and coated with fats to produce the final product. The installation will produce a wide range of products to meet specific customer demands initially on two process lines. When fully developed there will be four process lines Typically around 50 different products, based on variations to specific types of formulation, will be produced on a monthly basis. A summary of each of the planed process lines and the products produced are illustrated in Table 5 below.

Table 5.1: Illustrating the process lines in operation at the installation and examples of the specific animal feeds they produce.

Process Line	Industry Standard Description of the Product	Animal Feed Target Sector
Line 1	6.0mm pellets	Feed for all farm animals
Line 2	3.2mm, 6.0mm & 13mm pellets	Feed for all farm animals
Line 3	6.0mm pellets	Feed for all farm animals
Line 4	6.0mm pellets	Feed for all farm animals
Meal & Coarse Rations Line	Meals	Feed for all farm animals

The output in 2024 is anticipated to be in excess of 120,000 tonnes. The installation will operate on a 24/7 basis throughout the year. Production is only stopped on individual lines to facilitate maintenance and cleaning programmes.

Production for 2024

Table 5.2;

Product	Production Tonnes	Ultimate Tonnes[1]
Meals & coarse rations	5,000	20,000
3.2 pellets	42,000	155,000
6mm nuts	65,000	200,000
13mm cobs	8,000	25,000
Total	**120,000**	**400,000**

1. estimate

Eventually when the mill is fully developed depending upon the mix of products, and the species to be supplied output could reach 400,000 tonnes p.a.

Figure 5.1 demonstrates schematically the generic process undertaken at the installation. The processes undertaken within the installation can be grouped and presented under the following series of discrete headings:

A. Overview of process controls
B. Raw material receipt and storage
C. Raw material handling
D. Processing:
    - Weighing
    - Grinding
    - Mixing
    - Conditioning
    - Pressing
    - Cooling
    - Fats Coating

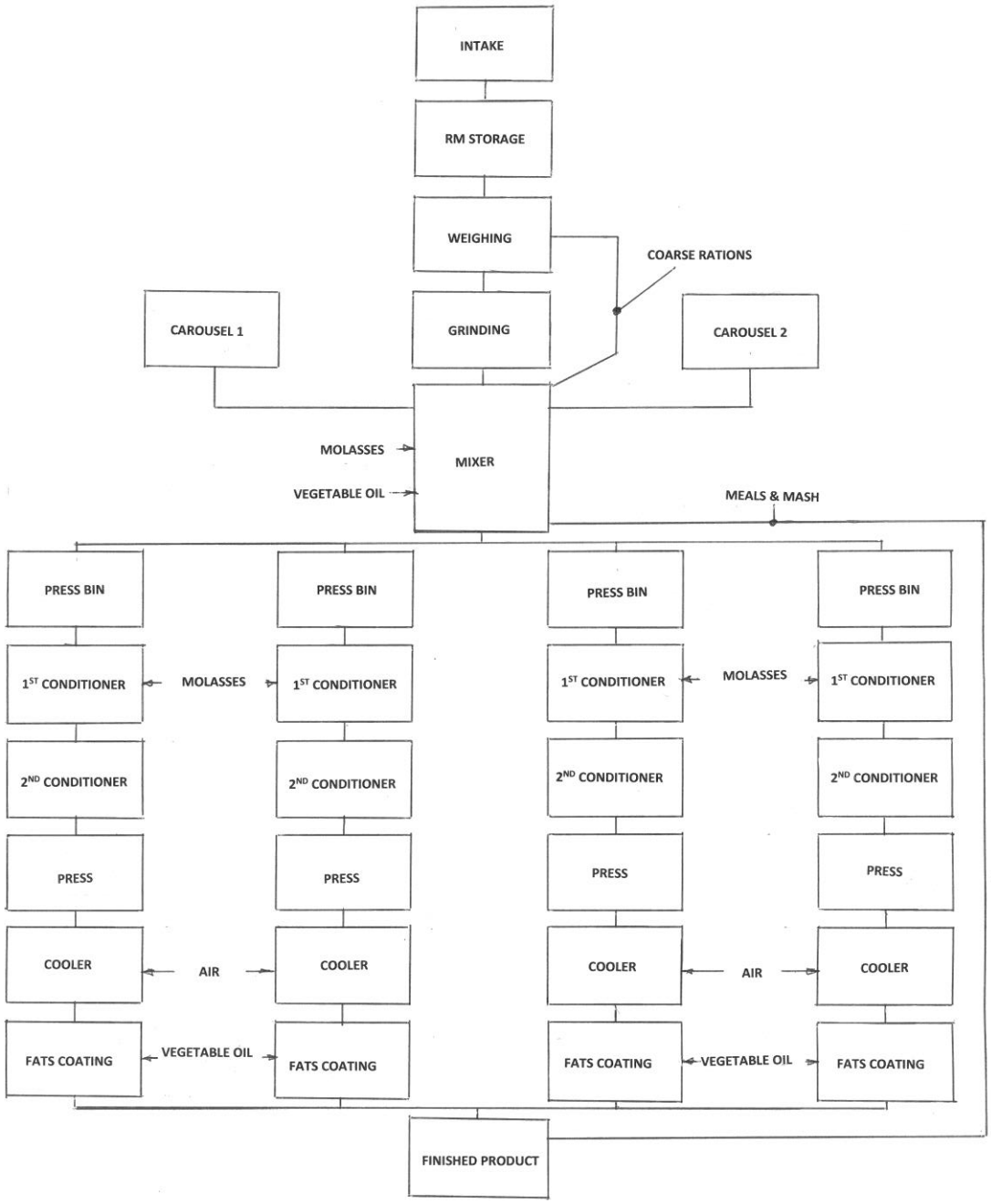
E. Product storage
F. Product dispatch

Other elements of in-process controls have been addressed as follows:

G. Utilities
H. Cleaning and sanitation

The remainder of this section presents a description of each of these processes including associated process controls.

Figure 5.1 – Schematic Process Flow Diagram



5.1. A. OVERVIEW

There is a generic set of process control mechanisms in place across the installation including:

a. Automated Control Systems

The manufacturing process is highly automated and computer systems are employed throughout the installation to support the control of the processes. The computer systems are managed from a control room located within the main production building which is permanently manned during production. Deviations from normal operating conditions trigger alarms within the control room, allowing the operator to take rapid remedial action.

b. Cooling Systems

The cooling system within the installation consists of four counter flow air coolers, one on each of the product lines. These coolers apply a direct flow of ambient air through the product within an enclosed system. Air leaving the coolers is ducted to a cyclone which removes dust from the air.

c. Ventilation Systems

In line with relevant Health and Safety legislation (including the Control of Substances Hazardous to Health (COSHH) Regulations) a number of the processing areas (the drug dispensing, one hand tip point, the raw material intake points and conveyors and elevators) have been installed with Local Exhaust Ventilation (LEV) to ensure occupational exposure limits are not exceeded. The ongoing performance of these ventilation systems is tested in accordance with maintenance procedures. In the event of modifications to the process, the adequacy of these ventilation systems is reviewed, and any necessary improvements are made accordingly.

Doors and windows within the main process building, incorporating the main warehouse, are kept shut.

d. Vacuum Systems, Pumps, Hydraulics and Valves

The equipment and systems employed have been designed and are maintained to ensure that they perform adequately and minimise fugitive emissions.

e. Quality Assurance

The products produced at the installation are regulated under the Feeds Hygiene Regulations EU 183/2005 The Animal Feeds (England) Regulations 2010. Compliance with this legislation is monitored and enforced by the Department of the

Environment Food and Rural Affairs (DEFRA), Local Authority Trading Standards Departments and overseen by the Food Standards Agency (FSA). The legislation is robust, providing controls on the materials that can be included within feeding stuffs to protect animals (and ultimately humans); DEFRA and the FSA are responsible for ensuring that human health is not put at risk through what is fed to animals, while the VMD controls the use of medicinal and/or 'zootechnical' additives to ensure that the health of animals is not compromised.

The Feed Hygiene Regulations require Animal Feed Manufacturers to be approved and The Dalton Mill will be registered under the Feed Hygiene Regulations.

The Dalton installation will actively conform to the UFAS (the Universal Feed Assurance Scheme) which is an industry-specific quality system that has been designed and implemented by the sector trade body, the Agricultural Industries Confederation (formerly UKASTA). The UFAS system defines a code of practice for the industry, with specific controls for the following:

- Design and maintenance of manufacturing sites;
- Storage of feed ingredients and product compound feedstuffs;
- The nature of the feed ingredients (specification, selection, transport, etc.);
- Good manufacturing practice, including control of recycled product;
- Loading and transport of finished goods (including controls for hauliers);
- Sampling and other quality control activities;
- Management of complaints and product recall;
- Personnel issues, including training and welfare
- Documentation and records.

Also included within the Feed Hygiene Regulations is a specific requirement for the operations at the site to be subject to a detailed and regular assessment in accordance with the HACCP (Hazard Analysis and Critical Control Point) risk analysis principles. Where any potential for hazard is identified (within the terms of reference defined as physical, chemical and microbiological) a plan for controlling the hazard has been written and implemented. This covers a range of scenarios including the potential for cross-contamination between different feed products and microbial contamination e.g., salmonella.

In addition to these legal and industry obligations, the installation is rigorously audited by downstream customers on a regular basis.

The installation complies fully with all relevant regulations and codes of practice to ensure product quality. Examples of these systems include:

o Raw Material Purchasing

All raw materials purchased by I'Anson Brothers Ltd for the installation are sourced from reputable suppliers in accordance with contractual agreements and supplier

assurance, in compliance with UFAS and also I'Anson Brothers Ltd internal standards.

- Feed Material Delivery

All Feed materials are delivered by approved hauliers who are registered to or agree to abide by the AIC accredited code of practice for hauliers (Trade Assurance Scheme for Combinable Crops (TASCC)). This scheme defines amongst other feed safety related areas, a haulage exclusion list which defines materials which must not be carried prior to transporting a load of Feed.

All hauliers are required to provide load records for the last three loads prior to the delivery of the Feed materials into the mill. If these records indicate that excluded materials have been transported within this period, then the installation has the right to refuse the load. The documentation accompanying all raw material deliveries is reviewed and approved prior to unloading.

- Inspection and sampling
  On delivery, but prior to unloading, all feed raw materials are visually inspected for integrity and quality. The following properties are considered, as applicable:
  - Hectolitre weight (for cereals only);
  - Moisture (for cereals and pulses only);
  - Colour;
  - Odour;
  - Presence of any foreign material;
  - Presence of insect infestation; and
  - Granulation (texture).

Once the requisite tests have been passed, the raw materials can then be unloaded. In addition, for selected raw materials, samples of bulk raw materials are taken and sent to an off-site independent laboratory for quality control testing. Samples for further testing are selected based on a pre-defined schedule. In the event that a delivery fails the laboratory analysis, the specific batch (or batches) of feed containing them can be recalled from customers. Further details are presented below (see product quality below).

- **Processing**
  Primary product quality control is achieved in the line. All equipment is enclosed and is designed to be inherently hygienic. Visual checks are performed on the work in progress during production runs to reduce product defects and minimise product re-processing.
  As part of the UFAS Management System all weighing equipment (e.g., load cells, scales and the weighbridge) are maintained and calibrated by an authorised scale inspection company.

The abatement equipment installed is operated continuously during abnormal operations, including start-up, shutdown and momentary stoppage to ensure that the emissions from installation are adequately controlled.

- **Product Quality**

To further enable I'Anson Brothers Ltd to ensure product quality to their customers, each batch is allocated a unique reference number which enables it to be tracked from raw material off-loading through the entire manufacturing process and, ultimately, to delivery. Through the thorough sampling and raw material delivery checking systems employed, I'Anson Brothers Ltd has been able to develop an audit trail which documents the following information:

- The material that was received at the installation;
- The supplier;
- The haulier;
- Details of any transport;
- Unloading assignment;
- Weight;
- Any quality comments;
- Analytical results;
- The receiver's signature;
- Processing conditions; and
- The date of dispatch.

This system not only ensures their customers the highest quality products, but also ensures that on the rare occasion that a product quality issue is experienced I'Anson Brothers Ltd is able to identify the source immediately and identify the location of the product and either recall it from their customers or retain it at the installation.

f. Yields

The efficient use of raw materials is a key element of process control in this high-volume business. The typical yield for the installation (based on a dry mass balance) is close to 100%. Product rejects occur due to deviations in the control of the process such as plant breakdowns or physical quality problems. Rejected product and particulate matter is re-worked on-site into saleable product recovered by the following streams:

- Reprocessing within the process, through initial collection in a designated bulk storage silo prior to reworking into the production schedule. Reprocessing is controlled through the application of UFAS combined with HACCP principles.
- Utilisation as a raw material in defined quantities in other products as required.
- Reprocessing as an entirely new batch.

These reprocessing options are further discussed in sections 5.1.6 of this application.

In line with BAT 2; To monitor our manufacturing process loss we follow a month end routine which enables us to report and analyse the loss. Throughout the normal course of business our systems record the total weight of raw materials coming onto site. These are booked into stock by each raw material. As they are then subsequently used in the production process they are weighed with the usage being recorded. This includes all liquid raw materials and water. Our weighbridge records the total weight of finished feed. despatched to customers. As part of our financial month end routine we compare the system recorded raw material usage (tonnes) with the despatched finished feed + opening stock – closing stock tonnage. This provides us with two total figures to compare (i.e. inputs and outputs) the difference being either a gain or loss. We consider 1% of the total production figure to be an acceptable threshold over the year. Individual month results can be misleading due to stock take inaccuracies. Our raw materials are all physically counted at least once a month. This is to check that the system is accurate, differences are investigated, and adjustments made when required. Trending data for our overall loss and individual raw material line level stock taking is also recorded. Any signs that loss is trending upwards is investigated. Documentary evidence is available if required, it has not been included due to the sheer volume involved. Energy is closely monitored & studied and discussed at Environmental meetings. Wastewater and gas streams are not a feature of animal feeds manufacture which is essentially a dry process.

g. Training

Training is an ongoing process at the installation and can be summarised as follows:

- Training ensures that every site employee has a working knowledge of the mill and the various process steps required to produce a finished product. This training is designed to ensure that all relevant personnel understand the principles and implications of the medicinal additives being used and addresses issues such as the potential hazards of the storage and handling of medicinal additives, including issues such as security, labelling and record-keeping.
- Operators receive training on a regular basis, and additional training on new equipment and / or processes to be employed. There is particular emphasis given to process control and quality assurance.
- Training procedures are adapted to accommodate any changes in codes of practice and legislation.

5.1. B Raw materials receipt and storage

The storage of dry raw materials and the manufacturing process are undertaken within the main process building. Deliveries of all raw materials are weighed upon receipt.

Cereals and other bulk tipped materials (including barley, soya beans, sunflower seeds, wheat meal and rapeseed meal) are received onto the installation in covered bulk-tipping lorries. The bulk delivery vehicles raise their bodies and discharge the raw materials through a grain sock into an intake grid into a receiving hopper.

The raw materials are then conveyed from the intake hopper in enclosed systems through to one of the dedicated raw material blending bins or silos inside the compound building. The blending bins for raw materials are fitted with high level alarms to ensure that these vessels are not overfilled. The conveyors are also equipped with LEV systems. Dust collected in these abatement systems is recycled into the process to minimise waste.

As part of the maintenance programme the bins and conveyors are cleaned periodically to:

Minimise the production of explosive atmospheres, which are often associated with the handling and storage of dusty materials;

Prevent/ reduce mould growth; and

Prevent insect infestation.

Minerals (including Salt, Dical, Cal-Mag and Limestone) are also delivered in bulk to the installation by road.

These materials are blown using the vehicle's pneumatic systems directly into storage bins, internally positioned within the compound building, by fixed position blow lines which are coupled via flexible hoses to the delivery tanker. All of these bins are fitted with high level alarms to prevent overfilling. Each mineral bin is fitted with a LEV line connected through to a reverse jet bag filter with the material collected being recycled for re-use.

Bulk liquid raw materials (including molasses, and vegetable oils) are delivered to the installation by road tankers and are pumped, using the vehicle's integral pumping systems, into designated storage tanks via flexible lines. All of the bulk storage tanks are to be located inside the building within a bund. Each tank has a volume indication gauge installed on it to minimise the probability of overfilling of the tank. In the unlikely event of overfilling, any spillage would be captured within the bunding. The oils (also referred to within the industry as fats), which are supplied with antioxidants added to them to prevent oxidation and to maintain quality, are stored in bulk storage tanks which are indirectly heated using steam coils for ease of subsequent handling.

Packed solid raw materials (such as vitamins and low volume mineral supplements). These are received directly into the main warehouse and stored on pallets in the supplier's primary packaging (typically poly-lined multi-layer paper bags) prior to use.

Packed liquid raw materials If required will be received directly into the main warehouse and stored in the supplier's primary packaging, such as Intermediate Bulk Containers (IBCs) or drums, prior to use.

5.1. C Raw materials handling

All bulk materials (both solid and liquid) are conveyed around the compound building using enclosed systems such as conveyors, pipework systems and pneumatic systems or via gravity feed as applicable, minimising the potential for fugitive emissions and to prevent ingress of foreign matter. The plant is designed to maximise the use of gravity feed conveyance, which minimises the energy consumption associated with material handling.

The solids conveyance systems are installed with LEVs to abate fugitive particulate emissions.

Fugitive emissions to air are further minimised by retaining all bulk solid and liquid materials in sealed or closed containers. As further described in Section B2.2 Emissions Control and Abatement the air displacement vents on the bulk solid raw material storage silos are abated. The air displacement vents on the bulk liquid raw material storage tanks are not abated as the materials used are not volatile.

All packaged materials (both solid and liquid) are stored in their original primary packaging prior to use. These materials are removed from the supplier's primary packaging prior to being weighed out and added to the recipe as required. The addition of prescription raw materials is undertaken in a dedicated extraction booth, to provide local exhaust ventilation and to reduce concentrations in the local area to meet occupational exposure limits.

5.1. D Processing

Introduction

Production is based on a batch manufacturing system, typically up to 4,000kg per batch. In 2024 the anticipated installation production output will exceed 120,000 tonnes. This will be comprised almost entirely of pelleted product, just a small quantity of meal or mash products.

The following processing steps are undertaken in sequence as discussed below and as illustrated in Figure 5.1.

The first three stages; weighing, grinding and mixing, are collectively described within the industry as blending operations.

a. Weighing

Bulk solid raw materials. The specified quantities of bulk solid raw materials are dropped from the blending and mineral bins, via screw conveyors/bin dischargers into one of a number of load cell mounted weigh scales. In addition to this there is a small weigh scale dedicated to carousel ingredients. The minerals will be transferred

directly to the mixer using a dense phase blowing system. This facility will ensure all these essential materials are transferred to the correct batch thus ensuring product integrity.

Bulk liquid raw materials are pumped from the bulk storage tanks using dedicated pumps and process lines and added to the work in progress, or 'mix', as required.

Packed raw materials are weighed out manually using weigh scales prior to being added to the mix, as required. The consumption of these licensed raw materials is recorded in a register to facilitate subsequent verification of the materials and quantities consumed.

b. Grinding

In order to ensure the homogeneity of the finished product and to produce the physical attributes required, the cereal and protein raw material ingredients are ground and sieved prior to being conveyed into the mixer top hopper.

The electrically driven grinders are used to grind the material to a uniform particle size. Rotating hammers within the grinders break down the raw materials and force them through a mesh.

The grinders are mounted above collection hoppers which are vented via a reverse jet bag filter abatement unit which discharge externally. Once ground, the product is conveyed to the mixing plant top hopper by means of enclosed conveyors.

Coarse rations bypass this stage of the process as Fig 5.1 shows.

c. Mixing

From the top hopper the materials are gravity-fed into a batch mixer. At this stage of the process the low inclusion ingredients (representing typically 5% of the product mass), such as vitamins, trace materials and medicinal additives, are added directly into the mixer. Depending upon the recipe, liquid additives, such as oils can be weighed and added into the mix via dedicated lines at this stage.

The mixing is performed within a horizontal enclosed continuous mixer. The residence time for the mixing process is typically one to two minutes prior to despatch into the bottom hopper. When the mixing cycle is complete the homogeneous batch is conveyed for further processing in the press plant.

The mixing stage of the process is in an area in which tight controls and procedures are employed, as cross contamination can occur as a result of a batch of blended feed or raw material picking up traces of feed or raw material left behind by the previous batch. To ensure that cross contamination does not occur at this stage the installation operates in accordance with the UFAS procedures. In line with these procedures, production is planned to sequence batches of medicated feed together. When this is not possible, the processing system is purged with a small batch of raw materials such as non medicated cereal, known as a 'flush batch', to ensure that all traces of medicated additives are removed from the process lines and mixer. This flush batch is incorporated in a finished batch of product in accordance with the relevant code of practice.

Meals, mashes and course products are complete at this stage and are directed to the finished products section as shown in Fig 5.1.

d. Conditioning

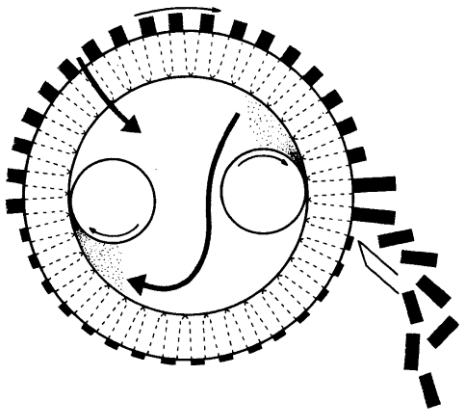
Conditioning is the term used to describe the process of adding steam directly into the mix to raise its temperature so that any bacteria present (such as salmonella) are eradicated. The conditioning process also causes the natural starches in the raw materials to gelatinise which results in the product binding into robust pellets in the subsequent pelleting stage.

The first stage is a feeder conditioner; here the feeder meters the product into a horizontal vessel. From the initial vessel the product passes to a second larger vessel or to a pre pelleting unit. These units are effectively two vessels arranged in tandem in order to achieve the necessary dwell time to fully condition the meal prior to pelleting. Each conditioner vessel incorporates a series of paddles arranged on the rotating shafts. The paddles convey the material some in reverse orientation to cause shear as the material passes along the conditioner's length. The steam injected at the entrance of the vessel gradually soaks into the mix. The steam also improves the 'workability' of the mix and gelatinises the starches, known in the industry as 'conditioning' in preparation for the subsequent pelleting process. Steam is supplied from the boiler and passed into the mix through insulated lines. At this stage, further materials (such as molasses) may be added as required. During the conditioning stage the mix typically absorbs 4-5% by weight of moisture. The meal emerges as a soft cake which is perfectly prepared for conversion into pellets in the ring-roll presses.

e. Pressing

After conditioning the hot mix is conveyed to one of the presses. As illustrated in Figure 5.2 pellets are produced by passing the mix into a press and extruding it through the ring dies.

Figure 5.2: Operation of a pellet mill die.



Different die dimensions and press rotation speeds can facilitate the production of different pellet sizes, to meet specific product requirements. Examples of the products and their physical dimensions are presented below in Table 5.2.

f. Cooling

After pelleting, the hot product is then passed through a counter flow air cooler to reduce its temperature, causing it to harden and become durable.

The cooling process involves air at ambient temperature being passed directly over the pellets. Waste air generated throughout this part of the process is ducted into a cyclone to remove product particulates and is emitted to atmosphere. The product particulates collected by the cyclones are recycled into production.

g. Fats Coating

Most of the processed product transfers into a fat coating unit into which vegetable oils (known within the industry as fats) are metered and added via a dedicated line to coat the product and to produce the required finished product characteristics. This dust suppression process increases feed energy and enables a higher physical quality to be obtained.

h. Finished Products

To ensure that all products produced at the installation meet the quality assurance standards required by their consumers all batches are physically inspected for colour, odour, texture, moisture (when appropriate) and physical dimensions.

5.1. E Bulk Product storage

Finished product is conveyed to one of the dedicated finished product bins located in the bulk delivery plant.

5.1. F Product despatch

Product despatch is conducted within the bulk plant the bulk vehicles drive into bulk delivery area and the vehicle is positioned under the appropriate bin to receive the pelleted feed.

Prior to vehicle dispatch from the installation all vehicles are covered with a ground operated roll over sheet.

The computer system operated throughout the installation ensures that the correct product consignment is despatched. All bulk deliveries of products are delivered to the customer along with a feed label to facilitate product recall in the unlikely event that this is required.

5.1. G Utilities

In support of the production processes there are a number of site utilities. These are described as follows:

a. Steam raising;

b. Boiler feed water treatment;

c. Air compressor; and

d. 11kV power supply imported from Northern Power Grid and currently supplied by Drax. The electrical capacity is 4kVA from 2 transformers. The transformers are housed in a purpose designed section within the building.

The remainder of this section deals with each of these areas in turn.

a. Steam Raising

As part of the process steam is primarily used to condition the product. It is also used to heat specific items of the processing plant.

The steam generation plant will have two steam raising boilers in the final configuration. This boilers fire natural gas, this will be supplied by Total.

Process stages and controls:

- The boilers are of modern design.
- The boilers are conventional packaged units consisting of a water tube design with the heated fluid contained in a fully welded tube bank.
- The boilers include economisers to maximise heat output and economy.
- Where appropriate / practical, condensate is returned to the boiler from the process.
- The boiler are subject to and comply with all aspects of the Medium Combustion Plant. Directive.

b. Boiler feed water treatment

Towns mains water is used for boiler feed water. Boiler feed water is softened before use and dosed with scale inhibitor and oxygen scavenger. The following controls are in place on chemical storage and handling of the boiler chemicals:

- The boiler chemicals are adequately stored in secure containers which are clearly labelled. (see MSDS for chemicals in supporting information Section 10)
- The boiler chemicals are located at the boiler house.

c. Compressed Air

The site operates a Kaeser CSD 105T rotary compressor dryer with inline cooler and integral air receiver, which has a nominal capacity of 494 cfm.

d. Power supply

This will consist of an incomer at 11kV feeding transformers rated at 2.0 KVA. The transformer reduces the potential to 440V three phase, and this is distributed by LV buss panels.

5.1. H Cleaning and Sanitation

The installation will operate a cleaning and sanitation programme, as part of the site's Environmental Management System (EMS). The intent of this programme is to minimise process downtime due to breakdowns and to maximise product yield and quality. The following practices will be employed to achieve this:

- All areas of the plant will be cleaned on a routine basis;
- All waste will be properly disposed of where recycling into the process is not possible;

- Raw material, work in progress and product spills will be immediately cleaned up and assessed and, where practicable, re-used in the process;
- Areas liable to produce fugitive dust will be inspected on a regular basis and corrective action to minimise these losses is taken where appropriate;
- All process operators are trained to keep their work areas clean and orderly;
- The building structure will be maintained to prevent access to the mill from birds, rodents and insects which may adversely affect the quality of the finished feed. Building maintenance will also help to limit the off-site effects of process noise and fugitive releases; and
- Pest control programmes will be operated by approved third party contractors, in accordance with the UFAS code of practice. Records are maintained of all pesticides utilised and the type of applications employed.
- The cleaning processes referred above are effectively dry processes no chemical products or wet processes are used.

5.2 Emissions control and abatement

Introduction

As part of the EMS (and further discussed in section 7 of this application) I'Anson Bros Ltd will employ a preventative maintenance regime to ensure that appropriate equipment such as key plant items, including abatement equipment, is effectively maintained to prevent breakdown.

Table 5.3: Summary of point source emissions to air

Release Point Ref	Activity	Techniques used to minimise emissions	Emission type and pollutant	Abatement equipment identifier	Proposed or existing
A1	Process Building - Cooler 1	Exhaust ventilation system incorporating a cyclone separator	Particulates and odour	Cyclone 1	Proposed
A2	Process Building - Cooler 2	Exhaust ventilation system incorporating a cyclone separator	Particulates and odour	Cyclone 2	Proposed
A3	Process Building - Cooler 3	Exhaust ventilation system incorporating a cyclone separator	Particulates and odour	Cyclone 3	Proposed
A4	Process Building - Cooler 4	Exhaust ventilation system incorporating a cyclone separator	Particulates and odour	Cyclone 4	Proposed
A5	Process Building – Grinder 1	Exhaust ventilation system incorporating a reverse jet filter	Particulates and odour	Grinder filter 1	Proposed
A6	Process Building – Grinder 2	Exhaust ventilation system incorporating a reverse jet filter	Particulates and odour	Grinder filter 2	Proposed
A7	Process building boiler flue	Preventative maintenance programme	Particulates, SO_x, NO_x and CO_2	Not abated	Proposed
A8	Process building boiler flue	Preventative maintenance programme	Particulates, SO_x, NO_x and CO_2	Not abated	Proposed

Diagrams
Site Plan 1.1.2 (referred to in section 1 which is the first section of supporting information) identifies all of the point source emissions to air.

5.2.2 Emission point abatement equipment

Abatement equipment in use for each emission point is described in detail in below in Table 5.4.

5.2.3 Abatement for specific pollutants

Table 5.3 above summarises details of abatement for specific pollutants emitted from the process at the installation. The specific pollutants emitted from the installation are:

Particulates;

Combustion gases (SO_x, NO_x and CO);

and Odour.

Particulates generated from receipt, storage and processing of the raw materials are abated using fabric filters and cyclones, with the dust collected being recycled into the process (further details on the specific abatement equipment used are provided within the section on abatement details below).

The combustion gases, particulates generated from the combustion process and odour are not specifically abated by secondary abatement systems.

5.2.4 Boiler and Combustion Plant Emissions

Introduction

The boilers utilised at the installation are fuelled natural gas and have a thermal input of less than 20MW (the actual net aggregated thermal input is 2.14 MW for each unit) required. The boilers are vented to atmosphere via a 38m high chimney.

Low NO_x burners are used on the boilers at the Dalton installation. NO_x emissions are minimised through regular boiler efficiency checks by approved third party contractors.

The boiler plant falls under the Medium Combustion Plant Directive, and comply with the NO_x, CO and SO_2 Emissions required, these will be checked at service intervals and reported as part of the annual activity submissions.

Electrical output (MW)

The boilers are not used for the purpose of electrical generation.

Thermal output

The boilers can raise a maximum of 3,000kg (60T/hr) of steam per hour.

Thermal input (MW)

2.14 MW per boiler.

5.2.5 Boiler Plant Procedures

The boilers are regularly maintained by approved third party contractors, who aim to maximise the boiler efficiencies and to minimise emissions, particularly of NO_x and CO_2. The contract extends to a call-out agreement in the event of boiler malfunction. I'Anson Bros Ltd staff are trained to undertake daily checks of boiler function, in accordance with operating procedures. The boiler plant is operated such that emissions of smoke achieve a colour of less than or equal to shade number 1 on the Ringelmann chart.

Vehicle wash

A vehicle wash is located at the edge of the yard to the east of the site. The facility will comprise a water recycling system with a suitable silt trap and SPEL TANKSTOR 300 type washdown holding tank 7.3m³ capacity. During the wash cycle the water will be directed to the holding tank from the washdown area valve. After the wash cycle the washdown area valve automatically ports to the surface water drainage system. This water is removed from site by an authorised waste handler and disposed of in a compliant manner

ABATEMENT DETAILS

The installation uses cyclones and fabric filters (bag filters) to abate emissions from point source releases.

Cyclones

Each of the four cyclone systems is fitted with a continuous dust monitoring system to control the abatement systems. The monitoring systems are linked to both the process control computer and an audible alarm (situated in the control room), to warn the operators of a blockage. On alarm activation the process control plc automatically shuts down the pelleting press feeder and coolers in sequence. The system can only be re-started when the blockage has been cleared. These units will comply with the agreed BAT AELS of <2-20 mg/Nm³

Further details of this abatement equipment are presented below in Tables 5.4 – 5.7.

Fabric Filters

The grinders each have an abatement system which comprises reverse jet filters. The filter abatement system controls continuously monitor the performance and are linked to both the process control computer and an audible alarm (situated in the control room), to warn the operators of a blockage. This occurs if the pressure drop across the filter departs from the normal range. On alarm activation the process control plc automatically shuts down the grinder feeder and filter in sequence. The system can only be re-started when the fault has been cleared. These units will comply with the agreed BAT AELS of <2-5 mg/Nm³

The 6 continuous discharge points will be subject to annual sampling by an accredited MCERTS specialist in order to ensure compliance with BAT 15 & 17.

There are also number of fabric filters in use at Dalton Mill. All these units however are vented internally so they do not need to be monitored under the Regulations. The in-house preventative maintenance programmes include filter inspection and replacement as necessary.

Cyclones

Table 5.4 Cyclone 1 (installed to abate Cooler 1)

Ref	Information required	Response
1	Process stage/Release point	A1
2	Abatement equipment identifier:	Cyclone 1
3	Approximate age of the unit	2023
4	Type: ○ Reverse flow ○ Straight through ○ Wet or dry	Reverse flow
5	Configuration: ○ Single ○ Multiple – Parallel or series	Single cyclone (emitting through one-point source)
6	Volumetric flow rate at operating conditions (m^3/hr)	32,000
7	Inlet dust loading, (mg/Nm^3)	Not known
8	Outlet dust loading (dry/wet), (mg/Nm^3)	3 – 7 (estimate)
9	Gas Temperature (in/out) ^oC	45 - 55^oC (estimate)
10	Provision for explosion and fire control	The inlet / outlet air is moist.
11	How is protection provided during start-up, shut-down and momentary stoppages?	The fan is interlocked with the process, preventing processing without the operation of abatement, in such a way that the cooler extractor fan has to be fully operational prior to the feeder to the pellet press (which feeds into the cooler) being able to operate.
12	Detail any significant differences between the current duty and design duty and the reason for them. Also comment on whether these differences have an adverse affect on environmental performance.	None
13	Are there any particular operational problems with these units?	None

Table 5.5 Cyclone 2 (installed to abate Cooler 2)

Ref	Information required	Response
1	Process stage/Release point	A2
2	Abatement equipment identifier:	Cyclone 2
3	Approximate age of the unit	2023
4	Type: ○ Reverse flow ○ Straight through ○ Wet or dry	Reverse flow
5	Configuration: ○ Single ○ Multiple – Parallel or series	Single cyclone (emitting through one-point source)
6	Volumetric flow rate at operating conditions (m^3/hr)	32,000
7	Inlet dust loading, (mg/Nm^3)	Not known
8	Outlet dust loading (dry/wet), (mg/Nm^3)	3 – 7 (estimate)
9	Gas Temperature (in/out) °C	45 - 55°C (estimate)
10	Provision for explosion and fire control	The inlet / outlet air is moist.
11	How is protection provided during start-up, shut-down and momentary stoppages?	The fan is interlocked with the process, preventing processing without the operation of abatement, in such a way that the cooler extractor fan has to be fully operational prior to the feeder to the pellet press (which feeds into the cooler) being able to operate.
12	Detail any significant differences between the current duty and design duty and the reason for them. Also comment on whether these differences have an adverse affect on environmental performance.	None
13	Are there any particular operational problems with these units?	None

Table 5.6 Cyclone 3 (installed to abate cooler 3)

Ref	Information required	Response
1	Process stage/Release point	A3
2	Abatement equipment identifier:	Cyclone 3
3	Approximate age of the unit	2023
4	Type: ○ Reverse flow ○ Straight through ○ Wet or dry	Reverse flow
5	Configuration: ○ Single ○ Multiple – Parallel or series	Single cyclone (emitting through one-point source)
6	Volumetric flow rate at operating conditions (m^3/hr)	32,000
7	Inlet dust loading, (mg/Nm^3)	Not known
8	Outlet dust loading (dry/wet), (mg/Nm^3)	3 – 7 (estimate)
9	Gas Temperature (in/out) °C	45 - 55°C (estimate)
10	Provision for explosion and fire control	The inlet / outlet air is moist.
11	How is protection provided during start-up, shut-down and momentary stoppages?	The fan is interlocked with the process, preventing processing without the operation of abatement, in such a way that the cooler extractor fan has to be fully operational prior to the feeder to the pellet press (which feeds into the cooler) being able to operate.
12	Detail any significant differences between the current duty and design duty and the reason for them. Also comment on whether these differences have an adverse affect on environmental performance.	None
13	Are there any particular operational problems with these units?	None

Table 5.7 Cyclone 4 (installed to abate cooler 4)

Ref	Information required	Response
1	Process stage/Release point	A4
2	Abatement equipment identifier:	Cyclone 4
3	Approximate age of the unit	2023
4	Type: ○ Reverse flow ○ Straight through ○ Wet or dry	Reverse flow
5	Configuration: ○ Single ○ Multiple – Parallel or series	Single cyclone (emitting through one-point source)
6	Volumetric flow rate at operating conditions (m^3/hr)	32,000
7	Inlet dust loading, (mg/Nm^3)	Not known
8	Outlet dust loading (dry/wet), (mg/Nm^3)	3 – 7 (estimate)
9	Gas Temperature (in/out) °C	45 - 55°C (estimate)
10	Provision for explosion and fire control	The inlet / outlet air is moist.
11	How is protection provided during start-up, shut-down and momentary stoppages?	The fan is interlocked with the process, preventing processing without the operation of abatement, in such a way that the cooler extractor fan has to be fully operational prior to the feeder to the pellet press (which feeds into the cooler) being able to operate.
12	Detail any significant differences between the current duty and design duty and the reason for them. Also comment on whether these differences have an adverse effect on environmental performance.	None
13	Are there any particular operational problems with these units?	None

Table 5.8 Grinder filter 1 (installed to abate Grinder 1)

Ref	Information required	Response
1	Process stage/Release point	A5
2	Abatement equipment identifier:	Grinder filter 1
3	Approximate age of the unit	2023
4	Type: ○ Reverse jet bag filter	Bags cleaned sequentially during process by automatically controlled compressed air jets pulsing against air flow
5	Configuration: ○ Single	Single filter (emitting through one-point source)
6	Volumetric flow rate at operating conditions (m^3/hr)	11,000
7	Inlet dust loading, (mg/Nm^3)	Not known
8	Outlet dust loading (dry/wet), (mg/Nm^3)	<1(estimate)
9	Gas Temperature (in/out) ^oC	45 - 55^oC (estimate)
10	Provision for explosion and fire control	Fully protected as required by DSEAR regulations.
11	How is protection provided during start-up, shut-down and momentary stoppages?	The fan is interlocked with the process, preventing processing without the operation of abatement, in such a way that the filter fan has to be fully operational prior to the feeder to the Grinder being able to operate.
12	Detail any significant differences between the current duty and design duty and the reason for them. Also comment on whether these differences have an adverse effect on environmental performance.	None
13	Are there any particular operational problems with these units?	None

Table 5.9 Grinder filter 2 (installed to abate Grinder 2)

Ref	Information required	Response
1	Process stage/Release point	A6
2	Abatement equipment identifier:	Grinder filter 2
3	Approximate age of the unit	2023
4	Type: ○ Reverse jet bag filter	Bags cleaned sequentially during process by automatically controlled compressed air jets pulsing against air flow
5	Configuration: ○ Single	Single filter (emitting through one-point source)
6	Volumetric flow rate at operating conditions (m^3/hr)	11,000
7	Inlet dust loading, (mg/Nm^3)	Not known
8	Outlet dust loading (dry/wet), (mg/Nm^3)	<1 (estimate)
9	Gas Temperature (in/out) ^oC	45 - 55^oC (estimate)
10	Provision for explosion and fire control	Fully protected as required by DSEAR regulations.
11	How is protection provided during start-up, shut-down and momentary stoppages?	The fan is interlocked with the process, preventing processing without the operation of abatement, in such a way that the filter fan has to be fully operational prior to the feeder to the Grinder being able to operate.
12	Detail any significant differences between the current duty and design duty and the reason for them. Also comment on whether these differences have an adverse effect on environmental performance.	None
13	Are there any particular operational problems with these units?	None

EMISSION LIMIT VALUES FOR EMISSIONS TO AIR

Table 5.10 Annual Mass Limits for Emissions to Air

Not measured

Substance	Annual Mass Emissions[2] (tonnes / line)	Proposed Limit	Comments
Particulates	1 – 2	None proposed	Benign material which is depositing predominantly on the site (due to the building and source characteristics).
NO_x	As per MCPD	100 mg/m³	SO_x Is determined by calculation for small boiler plant under the MCP directive NO_x & CO_2 Are measured annually for small boiler plant under the MCP directive. The limit for NO_x is 250 mg/m³ This & CO is monitored at 3 yearly intervals
CO_2	As per MCPD	None proposed	
SO_x	As per MCPD	None proposed	

Notes:
1: Values presented are estimates.

2: Total is a summation of the point sources (A1 to A4) which will be monitored annually.

5.2.6: Benchmark Data for Emissions from Each Emission Point to Air

Table 5.11: Benchmark data for emissions from each emission point to air

Emission Point	Substance	Normal concentration (mg/m³)	Benchmark concentration (mg/m³)[1]	Proposed limit (mg/m³)
A1	Particulates	3.0 - 7.0	20	10
A2	Particulates	3.0 - 7.0	20	10
A3	Particulates	3.0 - 7.0	20	10
A4	Particulates	3.0 - 7.0	20	10
A5	Particulates	< 1.0	5	2
A6	Particulates	< 1.0	5	2
A7	Combustion gases	Not measured	Not measured	None proposed
A8	Combustion gases	Not measured	Not measured	None proposed

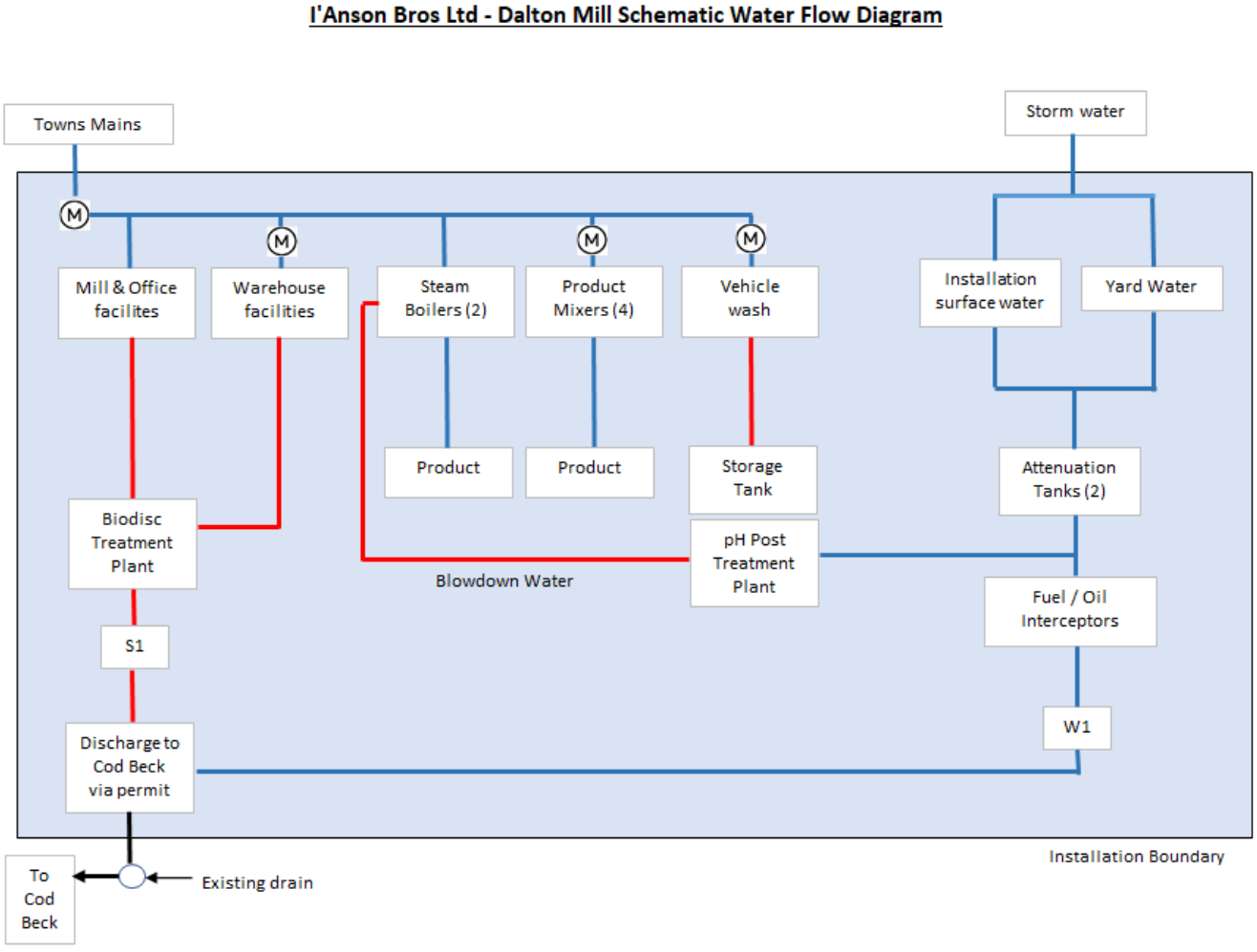
Note:
1: Benchmarks taken from the 2019 Breff conclusions

5.3 Effluent Discharge

As illustrated in Figure 5.3A & Table 5 below, the effluent generated at the installation is discharged via two routes: -

- Domestic effluent - off site via Klargester to S1 with discharge consent.
- Lorry wash to wash water holding tank for removal from site by an authorised handler.
- Blowdown water effluent - off site after pH correction via storm system.
- A minor amount due to air compressor condensate is also discharged via the storm system.
- Storm water from the roads, yard and roof runs off site via full retention separators.
- All the storm water joins the flow at W1. This consented discharge is variable in flow rate, but the 30 year storm event figures have been used to calculate the size of accumulation tanks. The water will leave site via the full retention separators.

Figure 5.3A Schematic Water Diagram



5.3.1 Location of emission points

Point source emissions to surface water and Klargester from the installation are marked on the site plan shown as Site Plan 1.1.3. The main releases and their associated controls are summarised in Table 5.12 below.

Table 5.12: Location of point source emission points to surface water and sewer

Discharge Point	References	Name of receiving water	Map reference of discharge point
Agricultural land with a technical connection to the installation	None	Not applicable	Not applicable
Non tidal river or stream (includes dry river or stream bed)	None	Not applicable	Not applicable
Tidal river or stream	None	Not applicable	Not applicable
Canal	None	Not applicable	Not applicable
Land	None	Not applicable	Not applicable
Coastal waters / estuary	None	Not applicable	Not applicable
Lake, loch or pond	None	Not applicable	Not applicable
Culverted river, stream or canal	W1	Tributary to Cod Beck	Site Plan 1.1.3
Sewer	S1	Klargester	Site Plan 1.1.3

5.3.2 Quantity of Effluent Produced

- Table 5.13 summarises effluent flow and characteristics, while the main releases and a review of the associated controls are presented below:

  Boiler blow down.

  This discharge incurs as a result of continuous bottom blow down from the boilers, which is used to control the build-up of solids in the boiler water. This is post treated for pH correction and discharged to the storm system and on to W1.

  Lorry wash effluent.

  This is directed to a storage tank for removal from site in a compliant manner.

  General domestic discharge to Klargester.

A small discharge occurs from the mill office at the site, referred to as private Klargester No1 on figure 5.3.
The unit is a Klargester BioDisc® a packaged sewage treatment plant utilising Rotating Biological Contractor technology for small domestic applications. BioDisc® in normal domestic situations, will produce effluent qualities of 8 mg/l BOD, 13 mg/l SS, 4 mg/l ammonia and 2 mg/l phosphate.

- **Surface run-off discharge.** This discharge is associated with rainwater. Rainwater is discharged off site by the site drainage system via full retention separators. In the event of severe storms the discharge is controlled by accumulation tanks. The storm water, boiler blowdown and air compressor condensate then flows through one of two full retention oil separators. These are referred to as Interceptors 1 and 2 on Figure 5.3. A discharge consent has been obtained see section 10 and form B6.

As presented schematically in Figure 5.3 above, the full retention separators prevent solids release or pollution of surface waters. The interceptors are included in the site EMS and are inspected quarterly, emptied and cleaned as required by an approved third-party contractor.

It is believed that, due to the following ongoing housekeeping and environmental incident management programmes, this effluent will not contain any environmentally damaging materials:

- As part of the EMS the external cleanliness of the site is maintained through a housekeeping procedure which will include the daily inspection and cleaning of the site.
- The potential impact of oil and fuel leaks from the vehicles present on site is carefully minimised through good vehicle maintenance and the use of spill kits. All drivers will be fully trained in their prompt and correct usage. As part of the EMS all third party's raw material deliveries or product collections are supervised and/or appraised by Dalton site personnel, who are able to respond quickly to environmental incidents.

Table 5.13: Effluent flow and characteristics

Ref	Maximum flow of effluent (m^3/day)	Average flow of effluent (m^3/day)	Average effluent temperature	Maximum effluent temperature	Maximum pH of the effluent	Minimum pH of the effluent
S1	3.0	1.5	Ambient	Not known	10	6
W1	Not known[1]	Not known[1]	Ambient	40°C	10	6

Note: estimates

1: As this effluent comprises rainwater run-off (by volume), the characteristics will vary with local weather conditions

5.3.2 Procedure for Emissions to Surface Water and Sewer

The action of the interceptor i.e. the oil/water separation and the removal of large particulates is considered to be 'primary treatment of the effluent'

5.3.4 Annual Mass Limits for Emissions to Water and Sewer.

Table 5.14 below presents any available information regarding the annual mass emissions to water (and sewer) from the installation.

Table 5.14: Annual Mass Limits for Emissions to Sewer (S1)

Substance	Annual Mass Emissions [1] (mg/l)	Proposed Limit
Hydrocarbons (oils) – separable grease and oil	100	No annual mass limit is proposed.
Sulphates (as SO_4)	100	No annual mass limit is proposed.
Sulphides, hydrosulphides, polysulphides and substances producing hydrogen sulphide on acidification	1.0	No annual mass limit is proposed.
Toxic metals	10,000 µg/l	No annual mass limit is proposed.
Cyanides or cyanogen compounds which produce hydrogen cyanide	1	No annual mass limit is proposed.
Total suspended solids at pH7.0	1,000	No annual mass limit is proposed.

Note 1: Based on consented values for emission point W1.

5.3.5 Benchmark data for emissions from each emission point to water and sewer

Due to the relatively innocuous nature and small volume of effluent discharged from the installation (less than $1m^3$/day) it is felt that the described arrangements are adequate.

5.3.6 Longer Term Studies

I'Anson Bros Ltd propose that there are no longer term studies required to establish the environmental fate and impact of the emissions.

5.3.7 Toxicity of treated effluent

No direct toxicity assessments (DTA) have been undertaken on the emissions from the installation, and none is proposed due to the nature of the effluent generated.

5.3.8 Causes of toxicity and any techniques proposed to reduce the potential impacts

Not applicable

5.3.9 Alternative methods to enable the reduction of BOD

None is proposed due to the nature of the effluent generated.

5.3.10 Indicative benchmarks for emissions to water

Not applicable

5.3.11 EFFLUENT TREATMENT AT OFF-SITE SEWAGE WORKS

The effluent generated by the installation is treated by a Local private Klargester.

Due to the relatively innocuous nature and small volume of effluent discharged from the installation it is proposed that this discharge is insignificant.

However, consent to discharge to public sewer is being sought, but this is a protracted exercise. If permission is eventually granted I'Anson Bros Ltd pledge to carry out this improvement.

5.3.12 DISCHARGES TO GROUNDWATER

The aqueous emissions from the site are routed to either foul or surface water drains and management systems are in place to ensure that accidental emissions from the site are properly controlled and minimised. There will be no discharges to groundwater.

5.4 CONTROL OF FUGITIVE EMISSIONS

5.4.1 Potential fugitive emissions to air

There are several potential sources of fugitive emissions to air from the installation. Table 5.15 below identifies the potential sources of fugitive emissions from the site and details how these losses are managed and minimised.

Normally in a feed mill, fugitive losses in the areas of highest potential release (i.e. the intake area and dispatch area), however as these activities take place within the buildings fugitive emissions will be close to zero. The site buildings are also maintained to ensure that they remain, wherever possible, dust tight (e.g. by only keeping process building doors open when necessary.) All other operations are managed such that visible emissions from the site are avoided.

Table 5.15: Potential fugitive emissions to air

Potential fugitive source	What are the potential fugitive emissions	Are there actual emissions (Y/N)	Quantify if possible (% estimate of total fugitive emissions for installation arising from specified source)	What techniques are used to prevent emissions?
Intake area	Particulates	N	The intake points will be enclosed which will minimise dust emission even in windy conditions	The intake of most raw materials is conducted within a covered intake point. Cereals are received through a dedicated intake point.
Dispatch area (via entry points into the main building)	Particulates	N	nil	Product dispatch is conducted within the main building in a dedicated dispatch area.
Entry points into the main building (vehicle and doorways)	Particulates	Y	Negligible (<1%)	Doorways are kept closed during normal operations
Open windows	Particulates	N	nil	Windows are kept closed during normal operations
General waste storage	Particulates	N	nil	Skips are located outside but covered.
Dust from spills on site roadways	Particulates	Y	Negligible (<1%)	Roadways are regularly cleaned with road-sweepers to remove dusty residues.

5.4.2 Chilling and Refrigeration

Chilling and refrigeration are not conducted at the installation.

5.4.3 Fugitive Emissions to Surface Water, Sewer and Groundwater see below;

Table 5.16 Potential fugitive emissions to water

Potential fugitive source	What are the potential fugitive emissions	Are there actual emissions Y/N	Quantify if possible, mass or % of total from installation	What techniques are used to prevent emissions

Run off from roadways onto the unmade ground adjacent	Vehicle (water, dirt, oil & residues)	N	Not applicable	The roadways are correctly metalled with a fully designed drainage system.

* No fugitive emissions will occur except in abnormal conditions.

5.4.4 Subsurface Structures

The routing of all installation drains and subsurface pipe work, subsurface sumps and vessels are shown on the site plan included as Site Plan 1.1.3 at the start of the application.

5.4.5 Subsurface structure containment and monitoring

Subsurface structures within the installation consist of the interceptor and the drainage systems. As part of the EMS, planned preventative maintenance is undertaken on these structures and any resultant maintenance that is required is conducted by approved third party subcontractors. Records of this maintenance programme are maintained on site. To ensure the effectiveness of the interceptors, they are regularly inspected and any waste residues arising (oil and particulates) are removed quarterly by approved third party contractors in accordance with relevant legislation and disposed of accordingly.

5.4.7 Manholes colour codes

The routing of drains at the installation is understood. All drain covers are colour coded, red for foul and blue for storm water.

5.4.7 Surfacing

All operational areas are equipped with an impervious surface and areas where substances are used that may have an environmental impact (e.g. oils) are further protected with spill kits. The condition of surfacing will be regularly inspected for signs of deterioration.

5.5 Potential pollution areas

Fugitive emissions to water could potentially arise through spillages, leaks and firewater discharge. Table 5.17 details the potential fugitive emissions to water from the installation and the control mechanisms that are used to minimise these losses.

Table 5.17: Potential Pollution Areas

Area	An impervious surface	Spill containment kerbs	Sealed construction joints	Bunding	Connection to a sealed drainage system
Liquid raw material storage within the main Building	Yes	Not required as the tanks are stored in bunded facilities	Yes	Yes	No
Bulk liquid raw	Yes	Not required	Yes	Yes	No

Area	An impervious surface	Spill containment kerbs	Sealed construction joints	Bunding	Connection to a sealed drainage system
material storage area within the main building		as all tanks are stored in single bunded facility			
AdBlue storage areas	Yes	Not required as the tanks are stored in bunded or self bunded facilities	Yes	Yes	No
Vehicular movement on site	Yes	No	No	No	No

The principle liquids (molasses x 2, ruminant fat, monogastric fat & soya oil) are to be stored in purpose designed tanks (5 x 60,000 litre tanks) within a common bund which is to be constructed inside the mill building. The fill points are located outside of the bund on the outside wall in an enclosed intake cabinet.

The bund will be constructed in a compliant manner and shall have a capacity of 99.13m³ (6.435 x 11.850 x 1.300), well in excess of the largest tank (60m³). The minor liquids will be stored in fixed specialist integrated tanks within the mill building, these are complete with liquid delivery pipework direct to the incorporation point. An alternative arrangement for the most modest inclusion levels is bunded liquid IBCs, these can be positioned as required for products manufactured occasionally or seasonally.

5.5.1 Storage Container Usage

All packaged liquids used within the installation are stored in the supplier's primary packaging prior to use. As part of the EMS system all packaged goods are regularly visually inspected and, where damage is found, the damaged packaging is either replaced or repaired.
Spillage assessments will be undertaken and recorded to demonstrate that, due to the storage location of packaged liquids within the main production building, combined with the nature of the hard standing around this area (large surface area and absence of incline), any spilled liquids would not run off to broken ground.

5.6 Odour

The table below summarises the receptors identified that may be affected by any odours released from the installation.

Table 5.18 Receptors

Table 5.18 (Table 1 from section 4)		
Receptor	Location	Distance
1. Poultry houses	Southwest	270 - 400
2. YO7 Storage Solutions & Pullan Transport	East	150
3. Cod Beck Mill Chemicals & various other businesses.	Northeast	150 - 400
4. J S Transport office & warehouses	Northeast	250 - 400
5. AJS Vehicle Repairs	Northeast	375
6. Kariario domestic dwelling bungalow & stables	Northeast	430
7. Domestic dwelling bungalow	Northeast	450
8. National Tube Stockholders warehouse	Southwest	470 - 650
9. Dwelling house	West	580
10. Dalton Bridge Park static caravan dwellings	West	590 - 750
11. Broad Acres dwelling bungalow	East	650
12. Inspired Pet Nutrition warehouse	Southwest	690 - 840
13. The Bungalow dwelling	Southwest	720
14. Dalton Bridge house dwelling	West	740
15. Dalton Industrial Estate a swath of various industrial premises	South	750 - 1250
16. Dalton Transport & Storage	East	860
17. Manor Farm dwelling	East	900
18. Fox Field dwelling	East	930
19. Dalton Village	East	From 950

5.6.2 Odour Sources

A list of the key potentially odorous materials used within the installation is presented below:

- vegetable oils
- molasses
- rape expeller
- soya
- distillers by products

The installation has the potential for causing odorous emissions primarily through various stages of the process such as receipt and cooling. Table 5.19 summarises all potential and actual odour sources at the installation.

The systems employed to reduce odorous emissions from the installation are summarised below:

- **Receipt**

Liquid materials are transferred within enclosed systems. Bulk solid materials are received in enclosed vehicles and tipped within the enclosed raw material intake bay.

Storage and Conveyance

All odorous materials used in the process are stored in appropriately sealed containers, such as bulk storage tanks prior to incorporation into the product. These tanks are fitted with breathing vents (to facilitate material receipt / discharge). As the tanks are all inside the building I'Anson Bros Ltd believes that the operation of these facilities does not result in the emission of offensive odours beyond the site perimeter (see section 5.6.3 below).

- **Processing Storage and Conveyance**

  All odorous materials are transferred / processed in enclosed systems. Whilst it is recognised that low levels of odours are emitted from certain point source emissions from the process, such as coolers, I'Anson Bros Ltd believes that these odours do not result in the emission of offensive odours beyond the site perimeter (see section 5.6.3 below).

- **Despatch**

  All odorous materials are transferred / processed in enclosed systems prior to discharge within the building into specialised vehicles.

5.19: Potential and actual odour sources

Source	Activity / process Description	Release point	Fugitive / Point Source	Materials
Cooler 1	Cooling operations	A1	Point Source	Product
Cooler 2	Cooling operations	A2	Point Source	Product
Cooler 3	Cooling operations	A3	Point source	Product
Cooler 4	Cooling operations	A4	Point source	Product
Grinder 1	Grinding operations	A5	Point source	Product
Grinder 2	Grinding operations	A6	Point source	Product
Intake area	Material receipt and conveyance	See Site Plan 1.1.2	Fugitive	Raw materials

Source	Activity / process Description	Release point	Fugitive / Point Source	Materials
Dispatch	Dropping of product into transport vehicles for despatch	See Site Plan 1.1.2	Fugitive	Product

5.6.3 Impact Assessment

Summary Extract from Environment Agency Guidance

Hedonic scores (also referred to as "Dravnieks") are derived from laboratory-based experiments. They give an indication of the relative pleasantness or unpleasantness of one odour when compared to another. These scores provide a quantitative benchmarking assessment when considering odours from industrial activities.

The higher the positive "score", the more "pleasant" the odour descriptor, and the greater the negative figure the more "unpleasant" the odour descriptor. The terms pleasant and unpleasant are used to indicate relative response rather than a sign of a positive or negative level of satisfaction. Zero cannot be considered to be neutral.

As presented above in section 5.6.2 the key odorous materials used within the installation are vegetable oils, molasses, and soya. The hedonic scores for these materials (where available) are presented below:

Oily, fatty: – 1.41

Molasses: + 1.00

I'Anson Bros Ltd have undertaken quantitative odour impact assessments on the sensitive receptors; in addition, I'Anson Bros Ltd undertakes to carry out routine monitoring of odours at the boundary of the installation in the form of downstream "sniff testing". This monitoring will be undertaken by on site staff with the results being documented and maintained.

Odour emissions have been modelled by Air Quality Consultants as part of the environmental risk assessments see section 4 of the supporting information.

5.7 MANAGEMENT

5.7.1 Environmental Management System

I'Anson Bros Ltd are resolved to manage the installation in the spirit and to the letter of the IED Regulations. A comprehensive management system has been devised. The site will be independently audited.

The site staff will be trained so that they appreciate the need for and scope of the permit and individuals whose duties impact with the environmental management will receive additional training.

Operational and systems procedures will be in place together with an extensive maintenance programme. Routine inspections and tasks will be recorded to agreed frequencies and in line with specific work instructions. The work instructions will ensure that all tasks are undertaken in line with the agreed standard and in a consistent manner.

The Environmental Management System (EMS) can be referred to in Section 7 of the supporting information

5.7.2 Managing documentation and records

Environmental records will be managed through a set of procedures within the EMS for identification, maintenance and disposal of documents. Table 5.20 summarises the management system document control employed by the installation.

The EMS-controlled documentation includes environmental manuals, registers, procedures and other primary documentation as part of the system. Individual copies of these documents are identified and issued to company personnel as appropriate. All documentation is subject to an annual review by the person responsible for management of environmental matters for the site to ensure its continued relevance.

Records such as meeting agendas and minutes, internal and external communications, audit plans, reports, non-conformities and corrective actions are all maintained by the person responsible for management of environmental matters for the site. Within the EMS are set procedures defining what comprises a record, who keeps the record and for how long.

Table 5.20 Management system document control

Documentation	Where Kept	How Identified[1]	Responsible Person
Policies	Company intranet	Unique reference number	Operations Manager
Responsibilities	Company intranet	Unique reference number	Operations Manager
Targets	Company intranet	Unique reference number	Operations Manager
Maintenance records	Hard copies on site	Unique reference number	Production Manager
Procedures	Company intranet	Unique reference number	Operations Manager
Monitoring Records	Hard copies on site	Unique reference number	Production Manager

Results of audits	Company intranet	Unique reference number	Operations Manager
Results of reviews	Hard copies on site	Unique reference number	Operations Manager
Complaints and incident records	Hard copies on site	Unique reference number	Operations Manager
Training records	Company intranet	Unique reference number	Operations Manager

Note [1]: All of the documentation referred to is identified within the EMS. (See section 7)

5.8 RAW MATERIALS

5.8.1 Raw Material Selection

As presented in section 3.1 In Process Controls, the raw materials used to produce the animal feed products at the installation, are regulated under the Animal Feed (England) Regulations 2010. Compliance with this legislation is monitored and enforced by the Trading Standards Department of the Local Authority and overseen by the Food Standards Agency. The legislation is robust, providing controls on the materials that can be included within feeding stuffs to protect animals (and ultimately humans).

Product quality is the principal criterion in determining raw material specification and all materials used in production at the installation are subject to rigorous quality checks in compliance with the:

- Aforementioned Regulations;
- HACCP (Hazard Analysis and Critical Control Point) risk analysis protocol;
- Environmental Management System (EMS); and
- Quality System, which is certified to UFAS (Universal Feed Assurance Scheme), the industry-specific quality scheme that has been developed by AIC and complies with EU requirements.

The Company purchases raw materials from approved suppliers supplying assured feed materials.

The site will maintain an up-to-date inventory of raw materials consumed on site, and as part of the EMS the site reviews this inventory on at least an annual basis, taking into consideration best practice environmental options in addition to customer requirements, cost effectiveness and the COSHH (Control of Substances Hazardous to Health) Regulations.

I'Anson Bros Ltd maintain contact with key research and development organisations to ensure that they adequately monitor advances in relevant raw material formulations and process technologies.

The points at which raw materials are added to the process are indicated in the process flow diagram shown in Figure 5.1 in Section 5.1A In Process Controls.

The installation operates an electronic database management system that integrates all of the data collection and financial control processes on site. This system facilitates effective analysis of materials utilisation through monitoring main process inputs against production output to ensure the maximum efficiency of raw material utilisation.

A list summary of the main and auxiliary raw materials used at the installation is shown in Table 15.21 below. The data is based on the typical current predicted annual usage levels at the site. The raw materials have been grouped into categories as described within the EU Catalogue of Feeding Materials (EU242/2010)

The raw materials stored on site are clearly potential polluting materials. The severity of the impact each category would have if released in an uncontrolled manner into the environment has been assessed. The vast majority are fully biodegradable so would have little or no long-term affect. The plant and equipment is however purpose designed for its duty. Mobile materials such as liquids are stored in correctly bunded tanks with tertiary hard standing around bunded areas. All storage vessels, bins and silos are sited on areas of hard standing thus preventing any passage to the ground or surface water.

The raw materials listed are selected based on availability or direction from DEFRA and there is no viable alternative for one or other of these reasons.

The environmental fate of all the raw materials listed above is that, apart from a minute proportion of waste described elsewhere in the application, these materials are incorporated directly into the finished product.

The raw materials used in the production of animal feeds, predominantly provender materials are fully biodegradable as they are naturally fully organic. These materials being naturally occurring materials do not have a COSHH data sheet and are by their nature low hazard. The table below sets out the range of substances and materials stored on site and processed or used in a typical year. These figures are an estimate for 2024 Jan – Dec inclusive. The absolute quantities used/consumed will vary from year to year, rising until the site is fully developed, but the proportions will be closely consistent with those recorded.

Table 5.21 Raw Material Inventory/Potentially Polluting Substances (estimates)

Raw Material/ Function	Chemical Nature/Composition	Typical Annual Usage (tonnes)	Maximum Amount Storable (tonnes)	Environmental Impact	Method of addition
Cereal grains	Natural product: Cereal grains	43,902	1,180	This raw material is a foodstuff, which poses no known impact (toxicological or ecological risk) and is considered readily biodegradable.	Automatic inclusion to recipe

Oil seed products and by-products	Natural product: Oil seed products and by-products	33,303	810	Potential negative impact on trade effluent / surface water quality in the event of a spillage.	Automatic inclusion to recipe
Cereal grass products and by-products	Natural product: Cereal grain products and by-products	29,322	770		Automatic inclusion to recipe
Minerals	Minerals (e.g. key materials being limestone and di-calcium phosphate with smaller quantities of other minerals such as sodium chloride, calcium magnesite, sodium bicarbonate)	3,153	420	Potential negative impact on trade effluent / surface water quality in the event of a spillage.	Automatic inclusion to recipe
Molasses	By-product from sugar refining	6,470	200	High BOD potential negative impact on water course	Automatic inclusion to recipe
Vegetable oil	Natural product: Oil seed products	2,553	300	Potential negative impact on trade effluent / surface water quality in the event of a spillage.	Automatic inclusion to recipe

Seeds Products and by-products of legume	Natural product: Products and by-products of legume seeds.	Nil[1]	Nil	Potential negative impact on trade effluent / surface water quality in the event of a spillage.	Automatic inclusion to recipe
Milk Products	Milk products: e.g. whey, dried milk powder	Nil[1]	Nil	This raw material is a foodstuff, which poses no known impact (toxicological or ecological risk) and is considered readily biodegradable. Potential negative impact on water courses in the event of a spillage.	Automatic inclusion to recipe

[1] nil initially as it is not possible to predict requirement or availability at this stage

Raw Material/ Function	**Chemical Nature/Composition**	**Typical Annual Usage (tonnes)**	**Maximum Amount Stored**	**Environmental Impact**	**Method of addition**
Medicines, Vitamins and Natural Extracts					
Premixtures of Vitamins / Trace Elements	Mixtures of: Vitamins A, D3, E, K and B group Amino Acids (lysine, methionine, threonine). Trace elements iron, copper, manganese, cobalt, zinc, iodine and selenium from sources such as oxides, sulphates, iodates and selenites. Palatability enhancers.	1,100[2]	24[2]	No persisting environmental influence is known or expected under normal use.	Automatic inclusion to recipe and hand additions as directed by the control system.
Non-Protein nitrogenous compounds	Urea	Nil[1]	Nil[1]		Automatic inclusion to recipe

Zootechnical Premixture		97[2]	10[2]		Automatic inclusion to recipe
Prescription Only Medicines (POMs). Medicated feedstuffs non-prescription (MFS)	Medicinal feed additives approved for use.	Nil[1]	Nil[1]	Products are biodegradable and not expected to result in any persistent environmental problem	Automatic inclusion to recipe and hand additions as directed by the control system.
Acidifiers & Antioxidants	Complexes of dry powder or liquid acids or aldehydes	100	6[2]		
Grand Total		**120,000**	**3,720**		
Raw Material/ Function	**Chemical Nature/Composition**	**Annual Production (tonnes)**	**Maximum Amount Stored**	**Environmental Impact**	**Method of addition**
Rolls, nuts, pellets & meals	Compound feeds manufactured from the raw material described above.	120,000	4,860	Food for farm animals.	Dispatched into bulk delivery vehicles and taken to farmer customers off-site.
Grand Total		**120,000**	**4,860**		

[1]Nil initially as it is not possible to predict requirement or availability at this stage

[2]Many of these ingredients will have back up storage in the warehouse, some hand added will be stored in the warehouse with the daily requirement in the mill.

Maximum total tonnage of raw materials and finished products stored could reach 8,900 tonnes when the mill is fully developed.

Raw Material/ Function	**Chemical Nature/Composition**	**Typical Annual Usage (tonnes)**	**Maximum Amount Stored**	**Environmental Impact**	**Method of addition**
Ancillary materials					
Hydraulic Oil	Complex hydrocarbons with additives	0.25	0.1	Potential negative impact on trade effluent / surface water quality in the event of a spillage.	Not incorporated into product
Lubricants and greases	Complex hydrocarbons with additives	1.0	0.3		Not incorporated into product
Detergent cleaning chemicals	Disinfectants approved by DEFRA for the purposes of the Diseases of Animals	3.0	1.0	Can cause damage to aquatic species, can cause damage to vegetation.	Not incorporated into product

	(Approved Disinfectants) Order 1978 (as amended) specifying the dilutions at which they are respectively approved.				
Boiler water treatment chemicals	Aqueous solutions of sodium hydroxide, sodium bisulphate, sodium polyphosphate, sodium boroheptonate.	0.3	0.1	Potential negative impact on trade effluent / surface water quality in the event of a spillage.	Not incorporated into product

5.8.2 Presence of pesticides[1] or other List I or List II substances in any of the raw materials

Table 5.22 presents the listed non-hazardous substances including (List I or List II substances and Substances of Potential Environmental Significance) respectively used within the installation. As described in the process description and within the Management Techniques section, procedures exist to control these substances.

Note 1: Pesticides are not used as raw materials within the process and their potential presence within raw materials is controlled by strict quality requirements.

Table 5.22 List of substances including Non-hazardous List I or II substances

List I or II substances	Actions taken to prevent release to the environment	Justification if no action taken
Premixtures of Vitamins & Trace Elements Non-Protein Nitrogenous Compounds Probiotics & Natural Extracts. Medicated Feeding Stuffs – prescription required (MFS)	• Raw materials are appropriately stored in closed/sealed containers prior to use. • Additions are controlled and records of quantities used are maintained. • In-process controls are applied to prevent uncontrolled releases. • Materials are ultimately incorporated into the product, with very small quantities released as hazardous waste.	Not applicable
Mineral oils, greases and lubes	• All stored in closed/sealed containers prior to use. • Usage is monitored and records kept. • Regular servicing and inspection of the plant and equipment is carried out to prevent uncontrolled releases. • These materials are collected and disposed of as waste oil.	Not applicable
Solvent cleaners and detergent cleaning chemicals	• All stored in closed/sealed containers prior to use. • Usage is monitored and records kept. • Regular servicing and inspection of the plant and equipment is carried out to prevent uncontrolled releases.	Not applicable

5.8.3 Waste Minimisation (minimising the use of raw materials)

I'Anson Bros Ltd has implemented specific programmes to minimise waste generation, such as segregation and reworking of out of specification work-in-progress, a waste minimisation audit has not yet been undertaken on the site. I'Anson Bros Ltd commits to, as part of the ongoing programme, undertaking a waste minimisation audit.

5.8.4 Process loss

As presented in Section 5.1 of this application, the efficient use of raw materials is a key element of process control in this high-volume business, as the typical yield for the installation (based on a dry mass balance) is close to 100%. The majority of the material conveyance and processing is undertaken within enclosed systems. An integral part of the day-to-day supervision of production (both manual and via the automated control system) and of the planned maintenance programme is the monitoring of the process to ensure that the installation operates effectively and efficiently with minimal process losses.

Table 5.23 below presents the key stages within the process where, due to the nature of the activity / design of the installation, process losses do occur. The site will take a proactive approach to minimising these losses and recycles / reprocesses these losses back into production to maximise production yields wherever possible. Further details of material recycling / re-processing are presented in section 5.11.6 of this application).

Table 5.23: Process lines and operations identifies as causing a process loss

Department	Operation	Estimated Amount Lost (tonnes/year)	% recovered in process or recycled
Intake Area	Intake area	0.1	0
Cooling Areas	Cooling	4-6	0
Dispatch Areas	Product dispatch – bulk out-loading	0.1	0
Total		**6.2**	0

5.8.6 Techniques to prevent or minimise pollution during cleaning, optimisation of cleaning schedules and Initial cleaning steps.

- **Main Process**

As presented in Section 3.1 'In Process Controls', in order to minimise pollution during cleaning, production is planned to sequence batches of medicated feed together. When this is not possible, the processing system will be purged with a small batch of raw materials such as non-medicated cereal, known as a "flush batch", to ensure that all traces of medicated additives are removed from the process lines and mixer. This flush batch is incorporated in a finished batch of product in accordance with the relevant code of practice.

- **Interceptors and Bunds**

As part of the EMS maintenance programme, the catch pits, gullies and bunds are inspected and if necessary, cleaned every three months, with any built-up sludge being removed and disposed of as non-hazardous liquid waste by a licensed contractor.

5.8.7 Cleaning in place (CIP)

There are no wet CIP systems within the installation. As described in Section 3.1 In-Process Controls, whilst production is planned to sequence batches of medicated feed together, when this is not possible, the processing system will be purged with a small batch of cereal, known as a "flush batch", to ensure that all traces of medicated additives are removed from the process lines and mixer. This flush batch is then routed into the next medicated batch for which the specific medicinal additive is required. During this process, in order to prevent or minimise pollution, all the standard operation process controls are applied as for a typical production run.

5.8.8 Product removed before the wash cycle

Not applicable

5.8.9 Recovery of cleaning chemicals

The installation will use cleaning products for general cleaning (cleaning aids such as generally used in domestic surroundings) around the site to maintain an acceptable standard of housekeeping, complement pest control programmes and to support the corrective actions implemented for minor environmental incidents (such as spillages).

All such materials will be sourced and consumed have been approved by the Department of Environment, Food and Rural Affairs (DEFRA) for food contact and are used according to the suppliers' recommendations for maximum efficiency / effectiveness (see Table 5.17).

Due to the small quantities of cleaning products utilised at the installation, combined with the dilution of these products in the cleaning process, I'Anson Bros Ltd does not consider it economically viable / practicable to recover these chemicals at present.

5.8.10 Effluent treatment

As presented in section 5.2 Emissions Control and Abatement, there are preparatory interceptors which allow solids to settle to facilitate removal from the effluent stream which discharges to the water course. The only other effluent treatment undertaken at the installation is the private Klargester installed to treat the domestic foul.

5.8.11 Comparison of process losses with any available benchmarks for total loss

Due to the high yield of the process, no benchmarks have been set for this industry sub sector.

5.9 Water Use

Overall water usage at the installation is low, with the mixing, conditioning process stages together with the boiler being the only significant process water users. Other minor processes that use water include domestic office use and cleaning. The table below summarises the source of the water utilised, and the total amount of water consumed annually.

All water systems in use on the installation are subject to preventative maintenance to minimise leaks.

Table 5.24 Estimated annual water consumption at the installation

Source e.g. river, town water	Amount (m^3 / yr)[1]
Potable water (mains)	27,000 m^3
Well water	0 initially

Note [1]: estimate

5.9.1 Water efficiency audit

Due to the small quantity of water consumed within the installation, combined with the current opportunities that exist for improving the efficiency of water usage, I'Anson Bros Ltd does not consider it appropriate to set water efficiency objectives for the installation. I'Anson Bros Ltd commits, as part of the ongoing programme, to review the applicability of introducing water efficiency objectives.

Whilst I'Anson Bros Ltd will implement specific programmes to minimise water consumption, a water efficiency audit has not been undertaken on the site. Due to the small quantity of water consumed within the installation, combined with the perceived extremely limited benefits that could be achieved through the implementation of a water efficiency audit, I'Anson Bros Ltd does not consider it appropriate to undertake a water

efficiency audit. I'Anson Bros Ltd commits, as part of the improvement programme, to reviewing the applicability of introducing water efficiency audits.

5.9.2 Breakdown of water consumption

Table 5.25

Use	Consumption	Monitoring	Amount (m^3 / yr)[1]	% of total	Monitored or estimated value [1]
Department or activity within the installation	Uses within the specific department of activity	Water quality requirements			
Mixer	Water incorporated into the product	Potable	6,000	22.0%	Monitored
Vehicle wash	Wash water	Potable	500	2.00%	
Boiler	Approximately 90% of the steam is used for conditioning process and is incorporated into the product	Potable	20,000	74.0%	Monitored
Domestic		Potable	500	2.0%	Estimated
Total			27,000[1]		Monitored

Note 1: estimate

5.9.3 Current water use and improvement targets

Vehicle Washing

As presented in Section 3.1 'In Process Controls', I'Anson Bros Ltd actively conforms to UFAS (The Universal Feed Assurance Scheme). The UFAS system has specific controls for the loading and transport of finished goods, which requires all vehicles to be visually checked / inspected prior to being loaded with foodstuffs. I'Anson Bros Ltd will carry out vehicle cleansing operations using the in-house vehicle wash.

Processing (Mixing and Conditioning)

As presented in Section 3.1 'In Process Controls', water (as a liquid and as steam) is used within the process, in the mixing and conditioning stages, to improve the product workability, consistency & quality and to kill bacteria.

Table 5.26 below presents a review of the water consumed within the installation.

Table 5.26

Process	Current installation performance litre water/tonne product[1]	Water efficiency objective(s) for this installation
Mixing	25	None set[2]
Boiler	90	

Notes

1. Based on production at Masham installation.
2. Due to the small quantity of water consumed within the installation, combined with the current limited opportunities that exist for improving the efficiency of water usage, I'Anson Bros Ltd does not consider it appropriate to set water efficiency objectives for the installation. I'Anson Bros Ltd commits, as part of the improvement programme, to review the applicability of introducing water efficiency objectives.

5.9.4 Details of potential sources of recycled water of suitable quality

Due to the nature and quantity of water consumed within the installation, I'Anson Bros Ltd does not consider it appropriate or economically viable at this stage to recycle water within the process. I'Anson Bros Ltd commits to, as part of the ongoing programme, reviewing this position on an on-going basis.

5.10 Waste handling & sources

Introduction

As presented in Section 3.1 'In Process Controls', the efficient use of raw materials is a key element of process control in this high-volume business and the yield for the installation (based on a dry mass balance) is close to 100%. Product rejects occur due to deviations in the control of the process such as plant breakdowns or physical quality problems. Rejected product and particulate matter is re-worked on-site into saleable product by the following streams:

- Reprocessing within the process, through initial collection in a designated tote bin prior to reworking into the production schedule. Reprocessing is controlled through the application of UFAS combined with HACCP principles.
- Utilisation as a raw material in defined quantities in other products as required.
- Reprocessing as an entirely new batch.

5.10.1 Arrangements for waste segregation

In generic terms, the waste streams produced at the site can be sub-divided into solid and liquid wastes. A specific area within the installation boundary has been designated for waste handling in which waste streams arising from the installation are appropriately segregated into special and general wastes. I'Anson Bros Ltd will continue to review

training procedures and waste handling procedures as part of the EMS to ensure that opportunities for increased waste segregation are sought wherever possible and that current levels of segregation are, at the least, maintained.

5.10.2 Systems in place to document information about waste (disposed of or recovered)

Waste transfer notes, which are provided by approved waste contractors for off-site reuse or disposal, are kept on site; these records include the nature, origin and volume of the transferred waste. These records are carefully assessed as part of the EMS audit. Before any contractor is used, their carrier certification and waste management licences (where required) are first checked and then recorded. In this regard, I'Anson Bros Ltd is compliant with the requirements of Duty of Care.

5.10.3 Storage Areas

The table below details the waste streams generated within the installation, where they are generated and where they are stored. The storage locations identified are demonstrated on site diagram 1.5 at the start of the application.

Table 5.27: Storage areas

Storage Area [1]	Waste Stored	Specific Storage Details
Main processing area	Production waste (to be reprocessed)	One blending bin 35 tonnes capacity is used for mixed meal (reprocessed)
Designated hard standing waste storage area	Production waste for disposal	Stored in dedicated container to the rear of warehouse area. See site plan 1.1.5.
General Waste	Used / damage filters, broken wooden pallets and raw material packaging	Stored in dedicated bins in warehouse area. See site plan 1.1.5.
Designated hard standing waste storage area	Old light bulbs etc.	Stored in a dedicated coffin type box in mill area See site plan 1.1.5
Designated secure area	Special waste: Zootechnicals	Stored in original packaging normally nil

The storage locations for the various waste streams are clearly marked and labelled. Waste storage areas are also located away from sensitive boundaries and watercourses.

The maximum storage capacities are stated for bulk storage of waste, in addition to the maximum period for which it may be retained on the site. No waste is stored on site for a period in excess of twelve months.

The waste storage areas will be regularly inspected and all non-conformities (such as leaking containers or de-segregation of waste streams) are reported, investigated and corrected. These inspection procedures will be reinforced within the EMS to ensure on-going application of BAT to the waste handling undertaken at the site.

5.10.4 Special Storage Requirements

The table below presents the storage techniques applied to hazardous materials

Table 5.28

Material	Techniques	Proposed Improvements	Improvement by (date)
Waste Oil	This waste material is stored within a dedicated waste oil tank within the vehicle wash building. The contents of the waste oil tank is collected by arrangement by a certified waste handler. This area is not at risk from ingressing flood or fire water and is adequately ventilated.	None proposed	N/A
Light bulbs / fluorescent tubes	Stored within dedicated storage container within a designated hard standing area within the compound mill.	None proposed	N/A

5.10.5 Measures to prevent emissions from storage or handling of wastes

No other measures are used to prevent emissions from waste storage and handling activities.

5.10.6 Waste recovery/disposal

The table below details the source, character and destination of the wastes arising from the activities undertaken at the installation. The data in the table are taken from the estimated operations at the installation.

I'Anson Bros Ltd environmental policy seeks to minimise the generation of waste by promoting efficient use of raw materials, energy and water. Internal programmes at the

site have also sought to reduce the amount of waste sent to landfill and increase the reuse, recycling and recovery of waste.

Opportunities for waste recycling or re-use are sought wherever practicable and indeed the majority of the solid waste produced at the site, rejected work in progress, is recovered and re-worked within the process. As a result, the typical yield for the installation (based on a dry mass balance) is close to 100%. Rejected product and particulate matter is recovered on-site by the following streams:

Reprocessing within the process, through initial collection in a designated tote bin prior to reworking into the production schedule, Reprocessing is controlled through the application of UFAS combined with HACCP principles.

- Utilisation as a raw material in defined quantities in other products as required.
- Reprocessing as an entirely new batch.

The EMS described in Section 7 includes procedures for waste management and control, particularly to ensure that the site remains in compliance with "duty of care" requirements.

Table 5.29 Waste Recovery/disposal

Waste Stream	Waste Characteristics / Examples	Source	Typical Quantity Per Annum	Recover / Disposal Method[1]
Production Waste	Waste suitable for re-processing from raw material through to product	Animal Feed production	500 tonnes	reworked
Production Waste	Waste not suitable for reprocessing	Animal Feed Production	150T	Recycled to energy recovery
General Waste	Used / damage filters, broken wooden pallets and raw material plastic and paper packaging	Animal Feed Production	20 tonnes	Recycled
Waste oil	Waste oil from maintenance	Waste oils from production / maintenance	1 litre	Energy Recovery
Scrap Metal	Used parts such as broken sieves and drums	Mill consumables	15 tonnes	Recycled
Light bulbs / fluorescent tubes	Internal artificial lighting	Processing, maintenance and clerical areas.	Virtually nil	Recycled
Empty plastic containers	Intermediate Bulk Container (IBC)	Raw material packaging	Virtually nil	Returned to the supplier

5.11 Energy

Introduction

I'Anson Bros Ltd operations at the installation will be party to the negotiated Climate Change Levy Agreement (CCLA) through the Agricultural Industries Confederation (AIC) trade body in place at the time of commissioning. A copy of the agreement is provided in Section 8.

As part of the EMS objective to bring about continuous improvement at the site, I'Anson Bros Ltd has developed and implemented an energy efficiency plan to minimise the use of energy at the installation by:

- The purchase of energy efficient equipment
- Maintaining and operating equipment in an efficient manner
- Continually reviewing the operation and identifying areas or practices that would result in improved energy efficiency
- Undertaking periodic reviews of the operations with the aim of identifying areas or practices that would result in improved energy efficiency.

Primary energy at the site is obtained from Natural Gas and electricity.

- **Natural Gas** is supplied to the Site by Total. Natural Gas is used to run the boiler.
- **Electricity** is supplied to the site by from Drax from the National Grid. The prime users of electricity at the site are processes such as grinding, mixing, pelletising and the conveyance of materials. The plant is designed to maximise the use of gravity feed conveyance, which minimises the energy consumed associated with material handling; and

I'Anson Bros Ltd will produce regular reports on the energy consumption of the installation (i.e. at least on an annual basis as required under the CCLA). Basic energy data, based on the consumption at the Masham site producing compound feeds in 2020, are described in Tables 5.30 and the associated CO2 emissions are shown in Table 5.31 below. The tonnage in question is similar to that estimated for Dalton mill in the early stages of operation.

Table 5.30 Annual Energy Consumption[3] Energy Source[2]	**Energy Consumption**		
	Delivered, MWh	**Primary, MWh**	**% of Total (Primary)**

Electricity from public supply[1]	3,216.7	8363.4	62.7
Electricity from other source[2]	0	0	0
Imported steam/hot water[2]	0	0	0
Light Fuel Oil[2]	0	0	0
Oil[2]	0	0	0
Coal[2]	0	0	0
Natural Gas	4,967.4	4967.4	37.3
Total	**8,184.1**	**13,330.8**	**100**

Production of compound feeds was 107,986 tonnes so the energy consumption per tonne was 0.0758 MWh/tonne. This is comfortably within the EPL for compounds which is 0.01 – 0.1 MWh/tonne specific energy consumption.

Note: 1: A thermal efficiency of 38.5% has been assumed that equates to a factor of 2.6.
Note 2: The installation does not currently use these energy sources.

Note 3; these are estimated figures

Based on converting the energy consumption values (primary fuel basis) by standard factors, the carbon dioxide (CO^2) emissions associated with the activities undertaken within the PPC defined installation are estimated in the table below.

Table 5.31 Annual Carbon Dioxide Emissions

Energy Source	**Annual emissions of $C0^2$ to environment (tonnes/year)**
Electricity (National Grid)	1388.4
Oil	0
Light Fuel Oil	0
Coal	0
LPG (liquid propane)	0
Natural Gas	943.8
Total	**2,332.2**

Conversion factors used:

Primary electricity = 166 kg/MWh
Gas = 190 kg/MWh

LPG (propane) = 285 kg/MWh
Oil = 250 kg/MWh

5.11.1 Specific Energy Consumption (SEC)

Carbon Trust funded Benchmarking Project. Many sites, being part of the animal feed industry, have contributed data to support the development of energy efficiency and benchmarking tool for the industry, which will enable participating sites to evaluate their specific energy consumption and identify and monitor bespoke energy efficiency improvement plans.

The table below is an example of the data collected to analyse energy consumption against specific products produced by the animal feed industry.

Table 5.32 2003 Collective SEC data for 'Carbon Trust' funded Benchmarking Project

Sub-Sector	Number of Sites	Output (kTonnes)	Average Output per Site (kTonnes)	Primary Energy (GWh)	Average Primary Energy SEC (kWh/tonnes)	Average Heat SEC (kWh/tonnes)	Average Electricity SEC (kWh/tonnes)
Pellets and Meal	126	12,500	99.2	1,724	137.9	41.8	37.6
Meal only	12	587	48.9	49	82.9	53.1	11.5
Coarse Rations	7	67	9.6	11	158.1	94.5	24.4
Fish Products	7	271	37.8	230	848.7	539.0	118.9
Grass Drying	7	55	7.9	119	2,187.2	1,824.6	139.6
Mineral Blocks	5	42	8.4	9	224.3	139.6	32.6
Other	8	204	25.6	185	903.2	600.3	116.6
Total	**172**	**13,727**	**79.8**	**2,327**	**169.5**	**68.2**	**39.6**

The unit operations performed within the manufacturing process have been analysed, through a series of techniques including sub-metering and regression analysis to classify the operations as follows:

- **Primary Operations** – energy intensive:
    - Grinding, Pressing, Expanding, Cooling
    - Conditioning (only major heat user)
- **Secondary Operations** – lower energy usage:
    - Conveyance, Mixing, Dust Extraction, Tank and Trace Heating, Fats Coating

This programme included analysis of the supporting operations (namely steam and compressed air generation), other small energy users (including lighting and heating of offices, warehouses etc.) to ensure that all of the operations performed on the sites were assessed and to yield the maximum benefits from subsequent energy efficiency programmes.

5.11.2: Basic Energy Requirements

Table 5.33, 34 & 35 below summarise the energy efficiency measures currently in pace at the installation.

Table 5.33 Operating, maintenance and housekeeping measures

Operating maintenance and housekeeping measures	Yes / No	Supplementary Information / Justification
1. Air conditioning, process refrigeration and cooling systems (leaks, seals, temperature control, evaporator/condenser maintenance)	Yes	As described in Section 3.1 once through ambient air is used to cool the work in progress after the pelleting stage. There are no other air conditioning, process refrigeration or cooling systems used in the process.
2. Motors and drivers	Yes	An in-house programme of scheduled maintenance has been developed and implemented.
3. Compressed gas system (leaks, procedures for use)	Yes	Maintain by third party specialist contractor
4. Steam distribution systems (leaks, traps, insulation)	Yes	Insulation is installed as appropriate.
5. Space heating and hot water systems	Yes	Insulation is installed as appropriate.
6. Lubrication to avoid high friction loss	Yes	An in-house programme of scheduled maintenance has been developed and implemented.
7. Boiler maintenance	Yes	The boiler is maintained by an approved third party contractor under a maintenance agreement. The boiler is operated continuously.
8. Variable speed drives on air compressors.	No	Not applicable

9. Phase optimisation of electronic control motors, such as inverters.	Yes	Grinder
10. Other maintenance activities within the installation,	Yes	The preventative maintenance system is additionally audited under UFAS.

Table 5.34 Physical measures

Physical measures	**Yes / No**	**Supplementary Information/ Justification**
1. Sufficient insulation of steam systems, heated vessels and pipework	Yes	• Lagging • Thermostatic controls such as fat tanks • Electric trace heating – self regulating
2. Provision of sealing and containment methods to maintain temperature	Yes	This insulation is maintained under the preventative maintenance programme (described further in section 2.3)
3. Simple sensors and timers to prevent unnecessary discharge of heated liquids and gases.	Yes	Simple sensors and timers are controlled under the automated control system.
4. Other appropriate measures	No	No further appropriate measures are employed within the installation

Table 5.35 Building service measures

Building Service Measures	**Yes / No**	Supplementary Information/ Justification
1. Energy efficient lighting is in place.	No	Energy efficient lighting is in place at the installation
2. Energy efficient climate control systems are in place including • Space heating • Hot water • Temperature control • Ventilation • Draught proofing	Not applicable	Energy efficient climate control systems are in place at the installation
3. Other appropriate measures	No	No further appropriate measures are employed within the installation

5.11.3 Energy Efficiency Plan

The milling industry has always been a significant user of energy. For centuries milling was the only industry which had moved from human endeavors and beasts of burden to provide motive power from natural resources. The industry was ahead of its time being probably the first to harness wind and waterpower.

The feed industry has a very low impact upon the environment, with the exception of energy consumption. This fact was recognised by the DETR Climate Change Secretariat. In 2001 the UK Agricultural supply Trade Association Sector (UKASTA) reached agreement with the Climate Change Secretariat to operate a trade body scheme known as the Climate Change Levy Agreement (CCLA).

Energy efficiency targets were set with a view to improving energy efficiency in stages over the juration of the agreement. All the easy measures were rapidly adopted, (in fact so successfully that the targets were rapidly reviewed). The fact is that now it has proved to be no longer possible to achieve the target reductions year-on-year improvements.

I'Anson Bros Ltd are however committed to improving energy efficiency, it is in fact a commercial imperative.

The original lighting system will comprise LED units.

There are various elements in the 'Energy Efficiency Plan' to reduce energy consumption as follows;

1. Through the use of effective production programming ensure that run lengths are maximised and change overs are minimised.
2. Running the plant as hard/fast as practical and shut down when the required production has been produced.
3. Trying to design-in energy efficiency measures when replacement or new plant is added.
4. Utilizing high efficiency electric motors when replacements or new plant is installed.
5. The use of electric counterbalance forklift trucks.
6. Perhaps most important, monitoring performance in order to correct deficiencies and adopt successful operations. 'If you don't measure you cannot manage'.
7. Checking compressed air lines and repairing leaks
8. Inspecting lagging and arranging for repairs and improvements as appropriate
9. Checking the correct operation of steam traps carrying out repairs and replacements as necessary.
10. Checking all steam lines regularly and carrying out repairs as necessary.
11. Ensuring that the steam boiler is operating at optimum efficiency through ensuring correct service intervals and burner adjustments etc.

Actions 7 – 11 are in fact routine housekeeping jobs, as such they feature as part of the SPMP, however they do contribute to energy efficiency.

Many of these measures and routines are in place essentially in response to the CCLA scheme which pre-dates the PPC Part A permitting regimen.

I'Anson Bros Ltd will continue to evaluate and implement, where applicable, these techniques, appraising the techniques employed in terms of CO_2 savings (tonnes/year).

5.12 Noise and Vibration

The Dalton mill site is located off Cod Beck Lane in a very rural sparsely populated area, but close to a developing section of Dalton Airfield Industrial Estate. The nearest noise sensitive receptors are residential dwellings.

5.12.1 Receptors

The table below presents the nearest noise sensitive receptors to the installation. The location of these receptors with respect to the installation is depicted in Figure 1.3a.

Table 5.18 – Definition of Noise Sensitive Receptors

Table 5.18		
Receptor	Location	Distance
1. Poultry houses	Southwest	270 - 400
2. YO7 Storage Solutions & Pullan Transport	East	150
3. Cod Beck Mill Chemicals & various other businesses.	Northeast	150 - 400
4. J S Transport office & warehouses	Northeast	250 - 400
5. AJS Vehicle Repairs	Northeast	375
6. Kariario domestic dwelling bungalow & stables	Northeast	430
7. Domestic dwelling bungalow	Northeast	450
8. National Tube Stockholders warehouse	Southwest	470 - 650
9. Dwelling house	West	580
10. Dalton Bridge Park static caravan dwellings	West	590 - 750
11. Broad Acres dwelling bungalow	East	650
12. Inspired Pet Nutrition warehouse	Southwest	690 - 840
13. The Bungalow dwelling	Southwest	720
14. Dalton Bridge house dwelling	West	740
15. Dalton Industrial Estate a swath of various industrial premises	South	750 - 1250
16. Dalton Transport & Storage	East	860
17. Manor Farm dwelling	East	900
18. Fox Field dwelling	East	930
19. Dalton Village	East	From 950

5.12.2 Filtering out Insignificant Sources

The majority of noise sources associated with the facility are internal to the process buildings, whereas the definition of noise, for the purposes of the PPC Regulations, is taken to refer to noise (and/or vibration) that is detectable beyond the site boundary. Key noise sources are defined as those that contribute to the potential for environmental nuisance.

The breakout of noise from the majority of internally located plant is such that internal noise sources below the Noise at Work Regulations First Action Level of 85 dB LAeq, 8hr have been considered as having only a low contribution to installation noise emissions.

5.12.3 Significant source of noise and/or vibration

The sources which need to be considered are those that may have an environmental impact. Key noise sources associated with the operations undertaken within the installation boundary noise sources associated with the operations undertaken within the installation boundary include the breakout of noise from noisy equipment to the exterior, external plant noise and vehicle movements. The potential noise sources, together with comments on likely significance are summarised in the table below, based on information provided from recent noise surveys conducted at similar plants.

Table 5.36 – Potential Noise Sources

Source	Location (External / Internal)	Intermittent or Continuous	Tonal or Impulsive Character	Noise Level dB LAeq, t	Contribution to External Installation Noise
Grinder area	Internal	Continuous	Neither	95	Medium
Press Floor	Internal	Continuous	Neither	90	Low
Boiler House	External	Continuous	Neither	65	Low
Intake	External	Intermittent	Neither	75	Low
Pump House	Internal	Continuous	Neither	67	Low
Out loading Bulk	External	Intermittent	Neither	87	Low
R M Bin – tops	Internal	Intermittent	Neither	82	Low
Mineral Bins	Internal	Intermittent	Neither	82	Low
Compressor Room	Internal	Continuous	Neither	82	Low
Coolers	Internal	Continuous	Neither	87	Medium
Fat Cooler Floor	Internal	Continuous	Neither	81	Low
Screw conveyor	Internal	Continuous	Neither	79	Low

Mixer	Internal	Continuous	Neither	80	Low
Bucket elevator	Internal	Continuous	Neither	81	Low
Filter unit	Internal	Continuous	Neither	82	Low

5.12.4 Mobile Noise Sources

In addition to the fixed sources given above, there are a number of mobile sources which predominantly relate to Large Goods Vehicle (LGV) movements on site.

5.12.5 Evaluation

The noise levels from the plant can be compared to the indicative BAT guidelines. Experience suggests that noise will be controlled to a sufficient degree.

5.12.6 Environmental Noise Measurement Surveys

I'Anson Bros Ltd has undertaken a detailed noise impact assessment as part of the Planning procedures. See section 4 of the supporting information. No significant noise is expected at the site boundary.

Note! the survey by Beechfield Design consultancy Limited is included in the appendices of section 4 of the supporting information of this application.

The relatively low measured ambient level indicates the absence of any external noise sources of key significance and this is reinforced by the fact that;

Noise monitoring, both (OE) and at the boundary, will be carried out by I'Anson Bros Ltd when any significant changes to the plant or process are made.

In the event of any complaint, I'Anson Bros Ltd will ensure that the complaint is thoroughly investigated, and appropriate remedial action is carried out promptly.

5.12.7 Maintenance

Poorly maintained process equipment is a potential source of noise generation at any industrial site. As part of the ongoing operating and maintenance programmes implemented by I'Anson Bros Ltd, noise assessments for key operational equipment are undertaken and corrective action is taken in the event that a specific item of equipment is emitting an abnormal noise. This preventative action minimises the likelihood of noise being generated as parts degrade.