**C3.1 Activities to be Varied**

The EPR Schedule 1 listed activity and the directly associated activities currently authorised by environmental permit EPR/FP3131WE are set out in the tables below. None of these activities will change as a result of the proposed facility development. However, the increased production capacity of the facility will require the installation of additional natural gas fired boiler / thermal oil heating plant for steam / hot water / hot oil production and the new chicken-based products line will introduce additional cooking equipment in the form of continuous frying and oven plant and additional refrigeration plant for incoming raw material and outgoing product storage areas. The currently authorised EPR Schedule 1 listed activity does not change as a result but the currently authorised directly associated activity relating to steam, hot water and electricity supplies does change (additional natural gas fired boiler and thermal oil heater). A directly associated activity is also added to reflect the installation of the new chicken processing and cooking facility. Both the change and addition are highlighted in yellow in the Directly Associated Activities table below. Further details of the plant and equipment changed or added as part of the proposed development are provided within this supporting document folder.

**Schedule 1 Listed Activities**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Installation name** | **Schedule 1 references** | **Description of the activity** | **Activity capacity** | **Annex I (D codes) and Annex II (R codes) and descriptions** | **Hazardous waste treatment capacity** | **Non-hazardous waste treatment capacity** |
| Production of meat based food products from raw meat and other food ingredients. | Section 6.8 A(1)(d)(i)  [Should read Section 6.8A(1)(d)(iii) – refer to table foot note] | Treatment and processing, other than exclusively packaging, of the following raw materials, whether previously processed or unprocessed, intended for the production of food or feed (where the weight of the finished product excludes packaging)—. (iii) animal and vegetable raw materials (other than milk only), both in combined and separate products, with a finished product production capacity in tonnes per day greater than— (aa) 75 if A is equal to 10 or more, or (bb) 300-(22.5 x A) in any other case, where ‘A’ is the portion of animal material in percent of weight of the finished product production capacity. | Current capacity = 100 tonnes per day, equivalent to 35000 tonnes per year  Capacity following completion of development = 260 tonnes per day (ie. an additional 160 tonnes per day) equivalent to 91,000 tonnes per year. | n/a | n/a | n/a |

*Table foot note :*

*Whilst the EPR Schedule 1 listed activity description 6.8A(1)(d)(i) was correct at the time when the permit was issued, it no longer reflects the activities carried on at the site due to changes to the Environmental Permitting Regulations made to implement the Industrial Emissions Directive. For the reasons set out below, the correct listed activity description should be 6.8A(1)(d)(iii).*

*At the time when permit EPR/KP33733AN was originally issued, part d of part A1 to chapter 6.8 of the 2010 Regulations contained only two options, (d)(i) for animal raw materials and (d)(ii) for vegetable raw materials. Given the large predominance of animal raw materials the permit correctly described the activity as 6.8A(1)(d)(i). However, the Regulations subsequently changed and in the 2016 Regulations a third option, (d)(iii), was added to allow animal and vegetable combinations to be accommodated in a more appropriate fashion and reflecting I.E.D. requirements. Further details are provided in Section C2.2b, Changes or Additions to Existing Activities, of the permit variation application.*

**Directly Associated Activities**

|  |  |
| --- | --- |
| **Name of DAA** | **Description of the DAA** |
| 1. Storage and handling of waste materials | Handling, storage, transfer and dispatch of waste from the listed activities and directly associated activities (From the generation of waste to the offsite disposal of waste) |
| 2. Refrigeration Plant | Generation of refrigerant for activities such as chilling and refrigerated storage (From receipt of carcasses and other finished goods to despatch of finished goods from the Installation) |
| 3. Product packaging | Product packaging (From finished product creation to final despatch) |
| 4. Storage and handling of chemicals | Handling and storage of chemicals for cleaning, fuelling and equipment maintenance. |
| 5. (current) Steam, hot water and electrical power supply | 2 x 1.3 MWh natural gas boilers and 3 x 250 kWh hot water heaters (Receipt of fuels to emission of combustion gases)  *(it should be noted that the facility also operates natural gas fired cooking equipment (ovens and grill) with a total thermal capacity of 1.4MWh)* |
| 5. (following variation) Steam, hot water, hot oil and electrical power supply | 2 x 1.3 MWh natural gas fired boilers and 3 x 250 kWh hot water heaters (Receipt of fuels to emission of combustion gases).  Additional 3.6 MWh natural gas fired steam / hot water boiler. Additional 2.9 MWh natural gas fired thermal oil heater. |
| 6. Food product cooking | Existing natural gas fired cooking equipment (ovens and grill) with a total thermal capacity of 1.4MWh).  Additional continuous hot oil heated fryers (3 x 605kW units) and additional hot oil/steam heated oven (1 x 900kW unit) – heat supplied by additional natural gas fired boiler and thermal oil heater plant described at (5) above. |

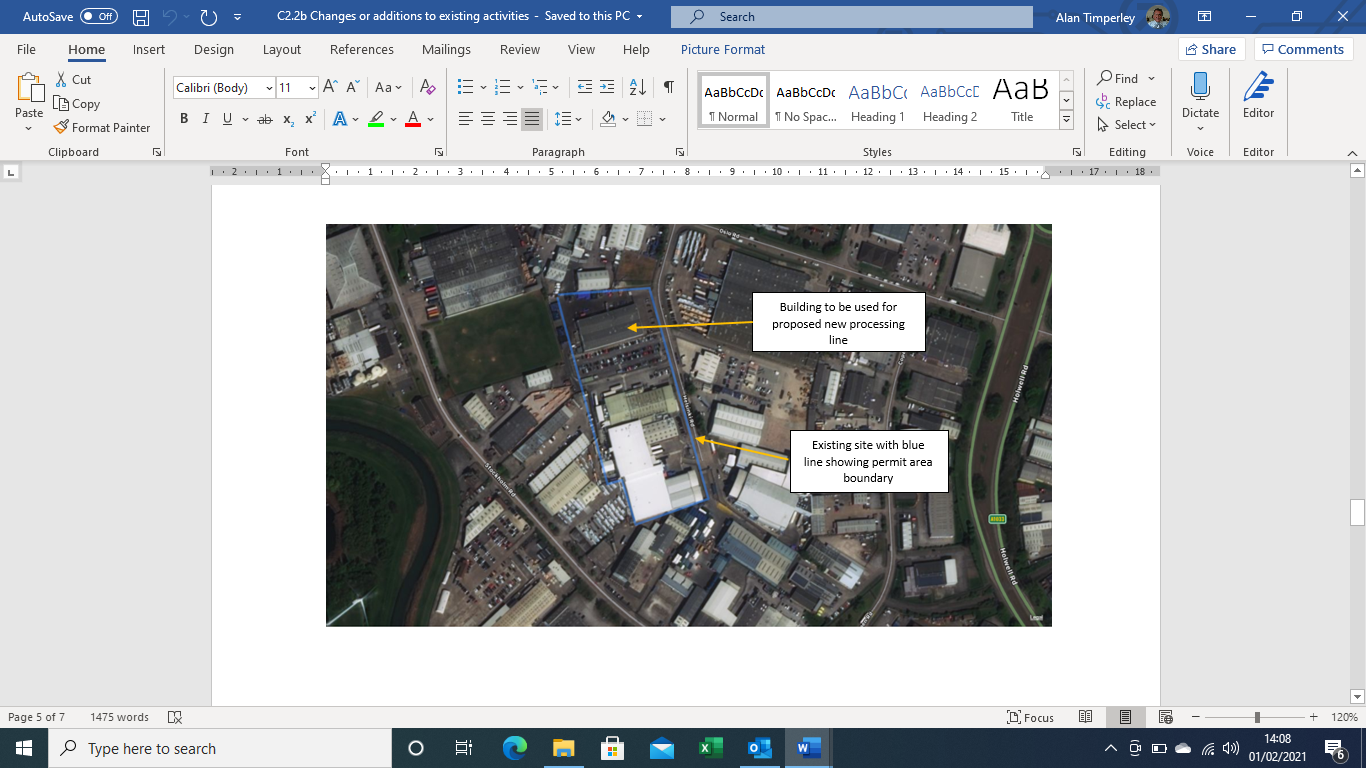
Below are descriptions of the changes and additions identified above along with relevant technical specifications, design and performance data.

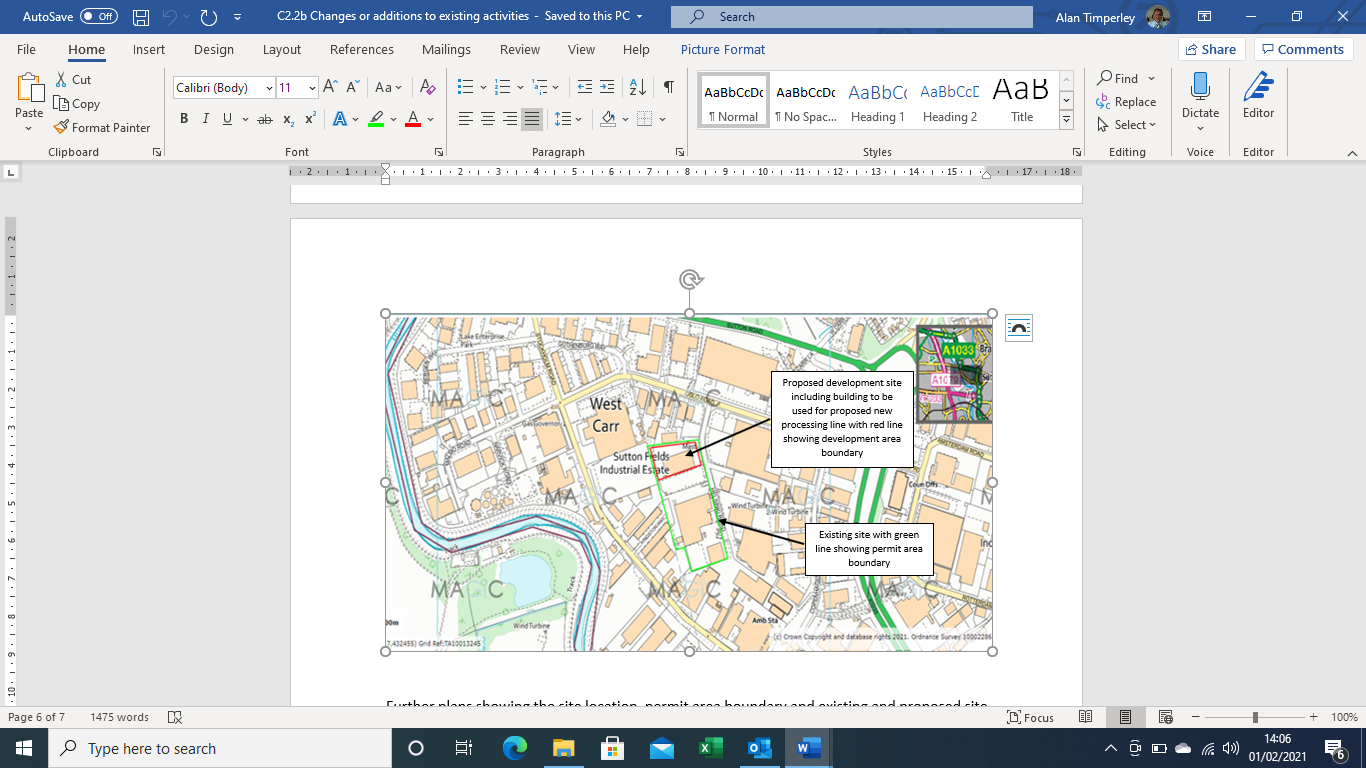
The changes and additions fall into four main categories;

* Changes to existing building and infrastructure including drainage systems
* Addition of a new processing line incorporating equipment for preparing raw ingredients for cooking (by mincing, blending, coating etc), cooking using continuous frying plant (using vegetable oil as the frying medium) and further cooking of selected products using a steam / thermal oil heated oven to process raw chicken meat and other food ingredient inputs to generate cooked products, and packaging / labelling equipment to produce packaged ready to eat chicken based - products.
* Addition of new gas fired boiler / thermal oil heating plant to satisfy increased steam / hot water and hot oil demands.
* Installation of new, additional ammonia / glycol-based refrigeration plant.

**Buildings, Infrastructure and Drainage Systems**

Introduction of the new processing line and associated plant and equipment will not require the existing site or permit area boundary to be extended as the processing plant will be housed within an existing albeit modified building at the northern end of the site, currently used for engineering / general storage purposes, which is located within the existing permit area boundary as shown on the aerial photograph and ordnance survey map below.





The existing building will be largely demolished then extended and refurbished to accommodate the new process line and associated service and amenity facilities and, as the building is physically separated from the existing production plant by a car park, the development site will be constructed in most respects as a “stand alone” unit with its own goods inwards, processing areas and service equipment such as boiler and refrigeration plant, despatch, offices and amenities etc.

The proposed building is substantial with a maximum height of over 14m compared with the existing building which is around 7m to roof ridge height. The use of a mixture of flat cladding and different types of profiled cladding will help to break up the expanse of the new building in comparison to the existing buildings which is finished primarily with profile cladding.

Illumination of the site will be carefully controlled by the use of cowling to direct light into the site, with lights positioned to reduce light spillage outside the confines of the site. The lighting strategy will incorporate cowled lighting on the buildings and low - level lighting around the edges of the hard standings.

The proposals to construct an extension onto the existing production facility have carefully considered the environment in line with BREEAM requirements. Where it has been viable to do so, the design has incorporated measures to maximise energy efficiency, reduce carbon emissions, prevent and control pollution, reduce waste generation and facilitate waste management, and promote the wellbeing of occupants.

In relation to drainage of uncontaminated surface and roof water from the extended site, the use of soakaways has been considered but the ground in the area is not suitable for the use of drainage infiltration systems. Other methods of sustainable drainage systems at source have been considered and rainwater harvesting for use in offices and amenities is incorporated into the design. Connection to the nearest suitable watercourse is not viable due its distance from site and the nature of the land use in the surrounding areas. Surface and roof water discharge from the site will therefore continue, as at present, to the local combined sewerage network. Domestic effluent and trade effluent from the extended site will also continue to discharge into the combined sewer network in Helsinki Road.

Site plans showing the revised site layout including, amongst other things, the main site features, new / extended drainage systems, new emission points to air, emission points to sewer and the permit area boundary are provided in Section C2.5a, Site Plans, of the permit variation application.

Further descriptive and technical details regarding the design and installation of the new and extended buildings and associated infrastructure are provided in this (C3.1) supporting document folder.

In addition to the proposed building and associated infrastructure and drainage systems, several new storage tanks will be installed as part of the proposed development.

Two insulated liquified gas storage tanks, one each for for CO2 and N2, will be installed to provide the gases required for modified atmosphere packaging. The tanks each have a capacity of 11000 litres gross (10450 litres net equivalent to 8.4te N2 or 11.5te CO2). The tanks are approximately 2.3m in diameter and 5.7m tall.

One liquified gas insulated storage tank for N2 will be installed to provide the gas required for soft mixing plant contents chilling. The tank has a capacity of 50960 litres gross (48410 litres net equivalent to 39te N2). The tank is approximately 3.0m in diameter and 12.06m tall.

One clean vegetable oil storage tank fabricated in helically wound plastic with integral bunding and having 60000 litres capacity will be installed. The tank is enclosed and fitted with contents level indication and control (ie. overfill protection), anti-syphon protection and is approximately 5.0m in diameter and 7.4m high.

One waste vegetable oil storage tank fabricated in painted mild steel with integral bunding and having 10000 litres capacity will be installed. The tank is enclosed, fitted with contents level indication equipment and is approximately 2.5m high, 5.5m long and 1.5m wide.

One cold process water storage tank fabricated in galvanised steel with butyl rubber liner and having 50000 litres capacity will be installed. The tank is enclosed, fitted with contents level indication equipment and is approximately 4.5m diameter and 3.4m high.

One hot process water storage tank fabricated in 304 stainless steel and having 60000 litres capacity will be installed. The tank is mineral wool insulated and clad with aluminium sheet. The tank is enclosed, fitted with temperature and contents level indication equipment and is approximately 4.6m diameter and 3.4m high.

One cold water storage tank to feed to fire suppression sprinkler system fabricated in galvanised steel with butyl rubber liner and having 290000 litres capacity will be installed. The tank is enclosed and fitted with an immersion heater to prevent freezing at low ambient temperatures, contents level indication equipment and is approximately 7.75m diameter and 6.1m high.

Two thermoplastic hygiene chemical storage tanks (for Active and Maxichlor) with integral bunding, each having 5000 litres capacity, will be installed. The tanks are enclosed, insulated and fitted with contents level indication equipment and are approximately 1.6m diameter and 2.5m high.

Further technical details relating to the liquified gas, clean and waste vegetable oil and hygiene chemical storage tanks are provided in this (C3.1) supporting document folder.

Below is a list of the relevant document identification references.

* 20-L33-IP017 - GROUND FLOOR INTERNAL LAYOUT PLAN
* 20-L33-IP018 - FIRST FLOOR INTERNAL LAYOUT PLAN
* 20-L33-IP019 - SECOND FLOOR INTERNAL LAYOUT PLAN
* 20-L33-IP020 - PROPOSED ELEVATIONS 1 OF 2
* 20-L33-IP021 - PROPOSED ELEVATIONS 2 OF 2
* 20-L33-PL004A EXISTING PLAN AND ELEVATIONS
* MAP liquified CO2 and N2 storage G-UCEDS-75M
* Soft mixer liquified N2 gas storage - VT50
* Cryogenic storage tanks - VT
* Clean vegetable oil storage – Innatank
* Waste vegetable oil storage – Ultra
* Hygiene chemical storage - CPV

**New Processing Line for Cooked Chicken Products**

A new process line for the production of ready to eat cooked chicken-based products will be installed in the extended building identified on the aerial photograph and ordnance survey map above. The production line which has a production capacity of 160 tonnes per day will include three continuous frying plant units using hot vegetable oil as the frying medium with selected products being oven cooked using a thermal oil / steam heated oven line.

A summary of the key stages of the process is set out below in text and in the form of a process flow diagram.

• Chilled and frozen chicken meat and other raw ingredients such as breadcrumbs, batter mixes and fillings, delivered to the facility in Large Goods Vehicles (LGVs) and unloaded into the material intake area:

• Vegetable oil delivered to the site in tankers and transferred into one of three bulk storage tanks located within a fenced compound. (The oil is pumped into processing vessels on the cooking lines via sealed pipelines when required):

* Raw food ingredients weighed into site and placed in raw materials storage with storage locations logged until materials needed for further processing:

• Chicken meat minced, mixed and portioned / formed into various products with simultaneous chilling by liquified nitrogen injection in “soft mixing” plant when required:

* Products coated in a batter mix followed by breadcrumbs:

• Breaded meat products cooked in a continuous fryer filled with vegetable oil:

* Additional processing line used to oven cook a proportion of the fried products when required:

• Cooked products chilled prior to being packaged and labelled:

* Products either weighed or counted into desired pack weight or count before passing to modified atmosphere packaging (MAP) and labelling:
* Packages passed through metal detector to identify any foreign objects requiring package rejection before visual verification of pack label contents and weighing for correct product content:

• Packaged products packed into outer packaging, palletised and placed into cold storage pending despatch from site.

The continuous frying plant consists of three 605kW rated cooking lines. Heat for the vegetable oil contained in the continuous fryers is provided by a 2.9MW Babcock Wanson thermal oil heater. Exhaust gases from the frying lines flow at a temperature of around 100C through six 250mm diameter vents (two vents per frying line). The exhaust gases are extracted directly to atmosphere at a rate of 1000 m3/hourby roof mounted fans. The continuous frying plant is fitted with automatic fire detection and suppression equipment.

The oven cooking line consists of a single 900kW rated thermal oil / steam heated unit. Heat is provided by the 2.9MW thermal oil heater which also serves the continuous frying plant and a newly installed 3.6MW Cochran ST23e steam / hot water boiler. Exhaust gases from the oven line flow through three separate exhaust vents. Exhaust gases at a temperature of up to 200C flow through two 500mm diameter vents extracted by in duct fans each at a rate of 7200 m3/hour. Exhaust gases at a temperature of around 100C flow through a single 250mm vent extracted directly to atmosphere at a rate of 500 m3/hour by a roof mounted fan.

Further descriptive and technical information relating to the continuous frying and oven cooking plant along with associated venting equipment, and the soft mixing plant is provided in this (C3.1) supporting document folder. Below is a list of the relevant document identification references.

* Fryer - TD TG0446 4830843
* Oven - TD TH0502 4725160
* Roof mounted fan TD TH1511 4757044
* In duct fan TD TH1512 4747649
* Softmix TD PM3025-28

It is worth noting that heat from the hot flue gases from the cooking plant, boiler plant and thermal oil heating plant is not recovered and used elsewhere in the process. This is because, whilst there is significant heat energy available from the flue gases in theory, the maximum heat load applies only on start up from cold. Once the cooking plant reaches the required temperature and energy is being supplied simply to maintain that temperature, the heat losses from the system are relatively small hence the heat load reduces considerably and there is minimal waste heat energy available compared with the peak load.  On this basis, the heat load is so low for the majority of the plant operating time that it is not economically viable to recover the heat energy.

Liquid wastes generated from cleaning of the cooking plant are collected via the internal drainage system and ultimately discharged to sewer together with other process derived trade effluents. Waste vegetable oil is stored temporarily in bulk storage before being sent off site for recovery.

Further details regarding raw materials, process emissions, energy use and waste are provided in sections C3.3c, C3.2, C3.6a/C3.6b and C3.6e of the permit variation respectively.

**Process Flow Diagram**

Vegetable oil storage

Chilled / Frozen Storage

Preparation and processing of selected ingredients by mixing / blending / mincing / slicing / coating etc including preparation in readiness for cooking

Cooking of prepared food ingredients by hot oil frying and by steam / hot oil heated oven.

Raw materials receipt

Selection of Ingredients from Storage

Dry goods storage

Transit packaging and placement in chilled / frozen storage pending dispatch

Metal detector / visual quality, labelling and weighing checks

Modified atmosphere packaging and labelling

Product portioning by weight or count

Product chilling in intermediate storage

Waste vegetable oil

Dispatch in refrigerated vehicles

Roof water collected for use in offices / amenities

Air extracted from cooking plant and equipment

Natural gas fired boilers / heaters generating steam, hot water and hot oil for use in process

General air extraction from working areas

Surface and roof water run-off discharged to sewer

All process derived waste-water discharged to sewer

Waste vegetable oil to off site recovery

Solid waste to off site disposal

Combustion gases emitted to air via exhaust stacks

Atmosphere

Public sewer

**New Natural Gas Fired Boiler Plant and Thermal Oil Heating Plant**

The introduction of the new chicken-based product process line will increase the overall site capacity from around 100 te/day to around 260 te/day hence there will be a requirement for additional gas fired boiler plant to satisfy the extended site’s increased steam / hot water demands. In addition, a natural gas fired thermal oil heater is required for the the new continuous frying and oven plant.

The additional boiler plant will consist of a Cochran ST23e 3.6 MWh thermal input rated steam boiler generating up to 5000 kg/hour steam at 9 barg pressure which will satisfy all additional steam and hot water demands. The boiler will exhaust via a 15.5m high 485 mm diameter vent stack (the vent stack passes through the roof of the 14.7m high building in which the boiler is situated terminating approximately 1m above the roofline exit point). The existing steam and LTHW boilers will be retained unchanged.

The thermal oil heater will consist of a Babcock Wanson EPC-ES 2.9MWh thermal input rated thermal oil heater. The thermal oil heater will exhaust via a 15.5m high 550mm diameter vent stack fitted with a 375mm diameter cone at the exit point to atmosphere (the vent stack passes through the roof of the 14.7m high building in which the thermal oil heater is situated terminating approximately 1m above the roofline exit point).

Both the new natural gas fired steam boiler and the thermal oil heater are New Medium Combustion Plant as defined in the MCPD and will comply in all respects with the requirements of the Directive. Completed copies of Form B2.5 (New Bespoke MCP/SG Application Form) including Appendix 1, Medium Combustion Plant Checklist, are provided in this (C3.1) supporting document folder in relation to the new combustion plant

Further details regarding the additional gas fired boiler plant and thermal oil heater are provided in this (C3.1) supporting document folder. Below are the relevant document identification references.

* Steam Boiler ST23 Tech SPECIFICATION
* Steam Boiler ST23 Factsheet
* Steam Boiler M & E Dwg Ref V130301B -Layout1
* Thermal Oil Heater EPC-ES & HRV
* Thermal Fluid Heater GA Ref 131117860

Further details regarding the impacts of emissions from the additional gas fired boiler plant are provided in Section C2.6, Environmental Risk Assessment, of the permit variation application.

**New Ammonia / Glycol based Refrigeration Plant**

The introduction of the new process line as an extension to the existing facility will require the installation of new, additional refrigerated storage capacity for both incoming raw materials and for generated product.

The installation will comprise an ammonia / glycol refrigeration system, with a series of dual temperature functions. The equipment will be installed in a new noise attenuated plant room adjacent to the factory entrance and will include four industrial compressors, one serving the glycol system, two serving the Low Temperature (LT) pumped ammonia system and one “swing” compressor which will be capable of providing back up to each system. The LT Ammonia system will serve the Spiral Freezer, whilst the High Temperature (HT) glycol system will be piped to various room coolers and air handling units (AHU's). All compressors will have variable speed drives (VSD) with high efficiency motors. Defrosting of the chill temperature air coolers will use 'free energy' recovered from the refrigeration oil cooling system. The higher temperature air coolers will have 'Off Cycle' defrost. The air coolers fed via pumped ammonia will be Hot Gas as standard.

The heat will be rejected via high efficiency evaporative condensers which will be mounted at roof level above the plantroom. Chemical free water treatment will be used.

On completion of the refrigeration plantroom build, an ammonia extraction / ventilation will be installed along with an 18-point ammonia detection unit linked to a shutdown ventilation system for both the ammonia plantroom and the first-floor valve station room.

Incorporated within the system design will be two heat recovery circuits, one for the office heating and one to preheat the boiler feed water. Warm glycol will also be used for underfloor heating and cooler defrosting.

The system is designed using the latest compressor technology design, with capacity control to ensure the capacity is always adjusted to suit requirements. Each compressor comes complete with VSD and its own state-of-the-art microprocessor which makes efficient running easy to control ensuring better operating economics. The condensers have with variable speed fan control matching fan operation precisely with the compressor control. The condensers are designed to have an excess surface area and with a reduction in air flow and fan power, give the lowest system condensing temperature and noise data, whilst absorbing the least power for the compressor drive motors. The refrigeration plant monitoring system is internet capable, with the standardised control modules being designed to meet the control and system management requirement associated with this design.

Further technical details regarding the new refrigeration plant design and installation are provided in this (C3.1) supporting document folder. Below is a list of the relevant document identification references.

* Document **P1190 Refrigeration Plant - Supply Scope** providing a full and detailed description of the proposed refrigeration plant installation.
* **Folder entitled Layout Drawings containing:**
* SURE-P1190-GA200-R8 Cooler Layout Plan Ground Floor
* SURE-P1190-GA201-R8 Cooler Layout Plan First Floor
* SURE-P1190-GA202-R8 Cooler Layout Plan Second Floor
* SURE-P1190-GA250-R3
* **Folder entitled Ammonia and Glycol Schematic Drawings containing:**
* 20-L33-FS001-R2-SHT1
* 20-L33-FS001-R2-SHT2
* 20-L33-FS002-R1-SHT1
* 20-L33-FS002-R1-SHT2
* 20-L33-FS002-R1-SHT3
* Explanatory Narrative to Accompany Schematic Drawings

**Other Facility Extension Implications**

Extension of the Cranswick Convenience Foods Sutton Fields facility to incorporate the new ready to eat cooked chicken products process line has other operational implications in addition to those described above but none are significant in terms of the environmental permit. Briefly these are:

* Operation of the extended facility will require around 150 additional staff.
* Operation of the extended facility will require the development of revised and in some cases new, additional operating techniques which satisfy the requirements of relevant guidance on BAT. These are described in Sections C3.3/C3.3a1 and C3.3b of the permit variation application.
* Operation of the extended facility will require the development of revised and in some cases new, additional maintenance and inspection procedures. In general, routine inspections of specialised plant and equipment are undertaken by site-based staff with maintenance undertaken by competent third-party contractor staff.
* Existing food hygiene / cleaning regimes will be extended to incorporate the new process line and associated working areas. Cleaning materials used will increase in quantity, but the types of material used will not change from those described in Section C3.3c, Raw Materials, of the permit variation application.
* Existing techniques and materials used for product packaging will not change but the overall site production capacity increase will result in an increase in the absolute quantity of packaging materials used (see Section C3.3c, Raw Materials, of the permit variation application).
* The overall site production capacity increase will result in an increase in the absolute quantities of wastes generated but in general the types of wastes generated, and the fate of those wastes will not change. An additional waste stream in the form of used vegetable oil will be produced at a rate of around 3000 te/year. The waste vegetable oil will be sent off site to a specialist recovery facility (see Section C3.6e, Waste Avoidance, of the permit variation application).
* The extended facility will result in the addition of new point source emissions to air and to sewer as described in Section C3.2, Emissions to Air, Water and Land, of the permit variation. There will be no emissions abatement equipment introduced in relation to the new emission points or to existing emission points as a result of the development.