Thornton Park Manufacturing Facility Environmental Permit Variation Application

Non-Technical Summary

Thorntons Limited

Thornton Park, Somercotes, Alfreton, Derbyshire, DE55 4XJ

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1.0 Introduction

SLR Consulting Limited (SLR) has been instructed by Thorntons Limited (Thorntons) to prepare a substantial Environmental Permit (EP) variation to the existing EP (EPR/WP3639QM) for the Thorntons chocolate and confectionery manufacturing facility (Installation) located at Thornton Park, Somercotes, Alfreton, Derbyshire, DE55 4XJ.

The Thornton Park site ("the site") is permitted as a Part A1 activity in accordance with the Environmental Permitting (England and Wales) Regulations (EPR) 2016 (as amended), specifically:

- Section 6.8 A(1)(d) 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 production capacity in tonnes per day greater than –

  - (aa) 75 where [the portion of animal material in percent of weight of the finished production capacity] is equal to 10 or more.

- Section 5.4 Part A(1)(a)(ii) Disposal of non-hazardous waste with a capacity exceeding 50 tonnes per day (or 100 tonnes per day if the only waste treatment activity is anaerobic digestion) involving one or more of the following activities, and excluding activities covered by Council Directive 91/271/EEC concerning urban waste-water treatment(a) —

  (ii) physico-chemical treatment.

The following Directly Associated Activities are also conducted on site:

- The use of gas-fired steam raising boilers;
- The use of gas-fired heating boilers that generate hot water which serves the jackets of the bulk chocolate storage tanks (each boiler has a thermal rated input of 0.15 MWth);
- Storage of raw materials; and
- Handling waste (waste collection within the Installation and storage prior to removal off-site).

This EP variation does not alter any of the above activities with the exception of the following in relation to existing boilers and emission points to air:

- Air emission points A4 and A5 (boilers (each 0.15MWth) which provide hot water to the pipework serving the chocolate storage tanks): these two boilers discharge via one stack (A5) and not individual stacks as stated in the EP application.
- Air emission point A7 (boilers in the packaging building providing comfort heating (each being 676.5 kWth) which exhaust via one shared stack): two of the five gas fired boilers have been removed.
- Emission point A6 (0.15MWth boiler which provided hot water to the chocolate storage tank jackets): this boiler is no longer in place.

In addition, this variation seeks to undertake the following additional production activities at the site:

- The production of Nutella (chocolate spread) (maximum annual production of circa 24,000 tonnes (circa 100 tonnes per day)); and
- Production of the Ferrero Collection Experience (FCE) confectionary range. Annual maximum production will be 1,550 tonnes per year (with a daily throughput of circa 13 tonnes).

This non-technical summary (NTS) provides an explanation of the proposed changes to the permitted activities.

The EP variation application comprises the following elements:

- Application forms (Parts A, C2, C2.5, C3 and F1);
- Non-Technical Summary;
- Best Available Techniques and Operating Techniques;
- Environmental Risk Assessment;
- Air Emissions Risk Assessment;
- Odour Assessment;
- Noise Risk Assessment; and
- Drawings.

1.1 The Site

The site is located on Thornton Park, Somercotes, Alfreton, Derbyshire, DE55 4XJ, centred on National Grid reference SK 41096 54474. The site, which is located approximately 2.6km north of Ripley and 15km northeast Derby city centre, is situated within the greater Thornton's Park, which is itself located within a mixed residential, industrial and agricultural area.

The site is bound to the:

- North: The A38, beyond which is Oakerthorpe Brook and the town of Alfreton;
- East: Woodland, Colliery Plantation and Venture Crescent Industrial Estate;
- South: Open land, sports ground, beyond which is the town of Swanswick; and
- West: Turnpike Business Park, beyond which is the B6179 and agricultural land.

The nearest residential properties are located on the outskirts of Alfreton, approximately 100m north of the site.

The nearest surface water feature are the drains located approximately adjacent to the south and east of the site.

The site location is presented on Drawing 001.

There are no receptors of European/international importance within 10km, including Ramsar Sites, Special Areas of Conservation and Special Protection Areas. There are numerous sites of national and local ecological importance within a 2km radius of the site, including:

- 20 Local Wildlife Sites (LWS), the closest being Colliery Plantation approximately 130m east;
- 2 Local Nature Reserves (LNR): Pennytown Ponds 1.2km east and Oakerthorpe LNR 1.5km northwest; and

- 3 ancient woodlands: unnamed Woodland 1.0km west, Broadoak Plantation 1.5km southwest and Carnfield Wood 1.7km northeast.

There are no National Nature Reserves or Sites of Special Scientific Interest (SSSI) within 2km of the site.

With respect to cultural heritage, there are multiple listed buildings within 2km of the site; the nearest is the House of Confinement approximately 570m to the north.

1.2 Overview of Existing Permitted Operations

The site consists of a facility which manufactures chocolates and other confectionery products; the Installation comprises all areas of the site involved in the manufacturing and storage of these products.

The manufacturing processes for chocolates and other confectionary products involve the following:

- Receipt and storage of raw materials;
- Chocolate and confectionery manufacture;
- Packaging and storage of manufactured chocolates and confectionery products; and
- Basic treatment (settlement) of process effluent on-site prior to consented discharge to municipal sewer.

Thorntons subcontracts the delivery of its products to customers to an appointed specialist fleet operator. The facility has refuelling facilities on-site for the fuelling of delivery HGVs with diesel.

The site is divided east to west by the main site spine road (this road is owned and maintained by Thorntons). Production activities are undertaken in the main in the Production Building located in the northern half of the site to the north of the spine road. The Packaging Building and warehouse, which provides chilled storage and non-chilled storage, are located in the south eastern site area, south of the spine road.

Process effluent is directed to the on-site effluent treatment area located in the north western site area. Other activities undertaken at the Installation include refrigeration, boilers for hot water and steam raising for production activities, cooling towers and diesel fuel storage for HGV delivery vehicles.

2.0 Environmental Permit Variation Application

This EP variation makes changes to a number of existing boilers and emission points to air:

- Air emission points A4 and A5 (boilers (each 0.15MWth) which provide hot water to the pipework serving the chocolate storage tanks): these two boilers discharge via one stack (A5) and not individual stacks as stated in the EP application.
- Air emission point A7 (boilers in the packaging building providing comfort heating (each being 676.5 kWth) which exhaust via one shared stack): two of the five gas fired boilers have been removed.
- Emission point A6 (0.15MWth boiler which provided hot water to the chocolate storage tank jackets): this boiler is no longer in place.

In addition, Thorntons are intending to add the following to the existing permitted activities:

- The production of Nutella (chocolate spread). This will include:
  - The installation of a new production line dedicated to Nutella manufacture (maximum annual production of circa 24,000 tonnes (circa 100 tonnes per day));
  - A new reverse osmosis water softening system;
  - The installation of raw material storage tanks/silos and management areas;
  - The installation of a new steam hazelnut roaster;
  - The installation of two natural gas fired boilers (each with a thermal rated input of 1.01 MWth) which will serve the hazelnut roaster.
- Ferrero Collection Experience (FCE) production. Annual maximum production will be 1,550 tonnes per year (with a daily throughput of circa 13 tonnes). The production of this confectionary range will include:
  - the installation of a new preparation area within the existing manufacturing building; and
  - the installation of a new 0.4MWth natural gas-fired oven (Buhler oven) in this preparation area.

2.1 Nutella Manufacture

The manufacture of Nutella will be undertaken in the existing manufacturing building on site. The manufacturing process will include the following:

- **Hazelnut preparation:** raw hazelnuts will be subject to cleaning, roasting and, milling. This will be undertaken in a new steam roaster.
- **Raw materials dosing room**: raw materials will be dosed and mixed in this room.
  - Granulated sugar will be piped (air transfer) from the newly installed external sugar tank to the new sugar receiver vessel located in this room;
  - Cocoa will be piped (air transfer) from the cocoa unloading station located in this room to the newly installed cocoa receiver vessel and then into a cocoa mill in this room;
  - Nutex (deodorised palm oil) will be piped (pumped) from the externally located Nutex tanks (3 new tanks) to the new Nutex receiver vessel in this room;

  - Skimmed milk powder (SMP) will be piped (air transfer) from the new SMP unloading station located in this room into the newly installed SMP receiver vessel;
  - The roasted hazelnuts will be piped (air transfer) into the Hazelnut Paste tank located in this room; and
  - Vanilla will be loaded into a new vanillin receiver vessel is also located in this room.

  These raw materials will be mixed in a water jacketed mixer.

- **Refining process:** The mixture will then be subject to pre-refining whereby the refining process modifies the particle size of the product and generates a ‘flour'.
- **Conching:** following refining the ‘flour’ is transferred to a mixer (conche/plastifier), where the dosage of the remaining ingredients takes place and the mass is mixed homogeneously. The semi-finished product is then transferred to an internally located storage tank (known as the ‘service tank’).
- **Tempering process:** The semi finished product will then be transferred from the service tank via heated water-jacketed pipes to a tempering machine in order to pre-crystalize the semi-finished product. The semi finished product will be cooled (air cooled) and then transferred to the dosing machine.
- **Dosing and packaging:** The semi finished product will be dosed into jars. The filled jars will then be sealed and capped with screw caps, dated and labeled or sleeved. The packed jars will then be sent to the existing maturation warehouse for maturation. The finished product will then be dispatched to customers.

2.2 FCE Manufacture

The manufacture of the FCE will involve the manufacture of specific praline confectionary products. This will be undertaken in the existing manufacturing buildings on site. The manufacturing process will include the following:

- **Wafer production (new process to be located in the Wafer Preparation Area):** raw materials, all of which will be stored in the existing raw materials warehouse with the exception of sugar which will be piped to this area from the externally located sugar storage tanks, will be weighed in the newly developed Wafer Preparation Area. Key raw materials will be blended in a mixer to prepare a batter. The batter will then be transferred to an oven (new Buhler oven) for cooking, following which the cooked wafers will be subject to humidification in a humidifier before being transferred to the existing Buhler moulding line.
- **Buhler Moulding Line:** the wafers will be cut in a new dedicated cutting station and then shaped and filled with praline.
- **Semifinished – chocolate:** dark, milk and white chocolate is used for the lining of the chocolate wafer moulds, decoration of the finished chocolates, and also in the manufacture of the praline fillings. Dark, milk and white chocolate (stored in the existing chocolate bulk storage tanks) will be delivered directly to newly installed chocolate depositor vessels located in the manufacturing building. The chocolate will then be delivered to a chocolate service tank (either a dark, milk or white chocolate service tank) where it will be delivered to a tempering machine and then to a respective dosing plate for either shell, bottom or decoration moulding.
- **Semifinished Preparation – confectionary praline filling:** The raw materials, all of which will be stored in the existing raw materials warehouse, with the exception of

sugar and palm oil (dependent on the type of the confectionary filling being manufactured) which will be piped to this area from the externally located storage tanks, will be weighed in and then blended in a mixer. The mixture will then be subject to refining (new process) where it will be passed via a pre-refiner and then a refiner which will modify the particle size of the product. The refined mixture will then be subject to final mixing and then transferred by a mobile tank to a storage room before being transferred to a dosing plate where is it used to fill the chocolate moulds.

- **Praline Maturation and Storage:** The manufactured FCE chocolates will be transferred to an intermediate storage area where they will be packed and sealed into trays and then sealed into an outer box. The boxed chocolates will then be packed into cases and either transferred to the existing chilled warehouse for 'hibernation' prior to dispatch to customers, or directly to the existing storage warehouse, prior to dispatch to customers.

The proposed changes will not result in a change to the operational hours of the manufacturing facility.

2.3 Operating Techniques

The proposed changes at the site will be operated in accordance with the relevant sections of the following key guidance documents:

- Develop a management system: environmental permits guidance, April 2023;
- Risk assessments for your environmental permit guidance, November 2023;
- Best Available Techniques: environmental permits, February 2016;
- Reference Document on Best Available Techniques (BREF) in the Food, Drink and Milk Industries, December 2019;
- Energy efficiency standards for industrial plants to get environmental permits, 1st February 2016 (updated July 2019); and
- Reference Document on Best Available Techniques for Energy Efficiency, February 2009.

2.4 Environmental Management System

Thorntons has an ISO14001:2015 certified Environmental Management System (EMS).

The EMS includes the policies, management principles, organisational structure, responsibilities, standards/ procedures, process controls and resources required to manage environmental protection across all aspects of the business.

The EMS will be updated to reflect the proposed changes as detailed in this EP variation application.

A summary of the EMS is provided in the Best Available Operating Techniques document (SLR reference 410.066170.00001 BATOT) submitted with this EP variation application.

2.5 Environmental Risk Assessment

An Environmental Risk Assessment (ERA) (SLR reference: 410.066170.00001 ERA) has been undertaken in accordance with the Environment Agency (EA) *Risk assessments for*

your environmental permit[1] (2016) and is included with the EP variation application. The ERA is a simple assessment of the risks to the environment and human health from accidents, noise and fugitive emissions that may be associated with the activities undertaken at the Installation. The aim of the assessment is to identify any significant risks and demonstrate that the risk of pollution or harm will be acceptable by taking the appropriate measures to manage these risks. The ERA has assessed the potential risks from the proposed changes based on the balance between the probabilities of exposure and the magnitude of the consequences of those exposures.

Overall, with measures in place to manage potential risks associated with the proposed changes, no significant environmental risks have been identified at the Installation.

2.6 Air Emissions Risk Assessment

An air emissions risk assessment (AERA) (SLR ref: 410.066170.00001 AERA) has been prepared as part of this EP variation in order to address the cumulative impacts of emissions to air (continuous emissions) from the following proposed plant at the installation:

Combustion emissions

- Emission point D1: steam raising boiler (serving the Nutella hazelnut roaster) (1.1MWth). Two boilers are proposed one of which will be a duty whilst the other will be standby, therefore only one boiler will operate at any one time.
- Emission points B1.1 and B1.2: Buhler oven serving the FCE waffle manufacturing process. The oven will have two emission points for the exhaust of natural gas combustion emissions.

Particulate emissions

- Hazelnut steam roaster: in total there will be six emission points to air from the hazelnut steam roaster:
  - Emission point C4: Hazelnut cleaning destoning
  - Emission point C5: Hazelnut heat chamber 1
  - Emission point C5.1: Hazelnut heat chamber 2
  - Emission Point C5.2: Hazelnut cooling chamber.
  - Emission point C6: Hazelnut roaster brushing
  - Emission point C7: Hazelnut roaster grinding mill
- Emission point C1.1: Nutella sugar storage silo dryer.
- Emission point C2: Nutella sugar feed / discharge conveying dryer.
- Emission point C3: Nutella BIG BAG dumping area skimmed milk / cocoa dryer.

In addition, the AERA has taken into account the changes to the existing boilers and emission points to air.

The AERA, which involved detailed assessment using dispersion modelling, concluded that:

[1] https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit

- The process contributions do not lead to any exceedances of the standards (long-term or short-term) for the protection of human health at any relevant exposure location outside of the site; and
- The process contribution from the proposed changes is considered to cause 'no likely damage' to the assessed ecological sites.

2.7 Odour Assessment

Due to the proposed new steam hazelnut roaster and the Buhler oven, an odour assessment has been completed (SLR ref: 410.066170.0001 AERA) to consider the likely magnitude and offensiveness of odours. The assessment indicates that the likely worst-case odour effect at a sensitive receptor is 'slight adverse'. Therefore, the likely significance of effects because of odours from site can be considered 'not significant'.

2.8 Noise Risk Assessment

The facility is located in a mixed commercial/residential/rural area, the nearest sensitive receptors being 250m to the north and south. The production activities are undertaken within the production buildings.

The proposed changes will not result in the installation of potential noise generating equipment externally at the Installation. The proposed changes will result in a number of additional HGV movements on and off site. A noise assessment has been completed in support of this EP variation (410.066170.0001 Noise Assessment). No significant issues were identified by this assessment as a result of additional HGV movements.

2.9 Key Technical Standards

The operational techniques that will be in place at the Installation to manage the proposed changes to the production activities undertaken at the Installation can be summarised as follows:

- The proposed manufacturing activities will be undertaken inside the existing production building, with the packaging and storage of manufactured chocolate and confectionary products undertaken in the existing packaging and warehouse buildings respectively.
- Sugar will be supplied in bulk and will be stored in a newly installed silo to be located externally in the yard. This tank will be provided with level and pressure gauges and a high level alarm.
- Nutex (deodorised palm oil) will be stored in 3 dedicated storage tanks also located externally in the yard area. These tanks will be provided with level and pressure gauges and a high level alarm. Secondary containment will be provided for these tanks, details of which will be provided once designed.
- Other food grade raw materials will be delivered to the facility in smaller qualities, typically in bags, boxes, sacks or tubs and some liquid materials in IBCs; these will be stored in dedicated internal raw material storage rooms.
- The Nutella manufacturing process will involve the use of softened water. Water (mains supply) will be subject to softening in a new reverse osmosis (RO) unit. The RO system will not involve the use of chemicals.
- The proposed changes will not involve the installation of new chiller/refrigeration equipment.

- The proposed changes will not result in the introduction of new cleaning chemicals to the site.
- The volume of wastewater that will be discharged to the ETP as a result of the new manufacturing activities is expected to increase to circa 6,740m^3 per year (circa 28.9m^3/day). The volume of treated wastewater discharged to sewer will not exceed the consented maximum discharge limit of 350m^3/24-hour period. The proposed changes will not result in a change to the composition of the effluent discharged to the effluent treatment system. Changes to the consented discharge limits for the discharge of treated wastewater to sewer are not considered necessary.
- The proposed changes will not result in direct discharges of potentially contaminating materials to water, groundwater or land from the Installation.
- Two new natural gas fired steam raising boilers at the facility will serve the hazelnut roaster. The two new boilers will be located in the manufacturing building, one of which will be a standby; both boilers will not operate simultaneously. Each boiler will have a thermal rated input of 1.01MWth. Due to the rated thermal input of each of the steam boilers, they fall under the remit of the Medium Combustion Plant Directive (MCPD). The stream boilers will operate for more than 500 hours per year, as a rolling average over 5 years, and will therefore be subject to the MCPD emission limit for nitrous oxides (NO_x) for new medium combustion plant of 100mg/m^3 and monitoring requirements. Monitoring will also be required for carbon monoxide (CO) in accordance with the MCPD, however an ELV will not be applied.
- The proposed two steam raising boilers will each have a water softening system (to be located on the same skid as the boiler). Water to be softened will be dosed with chemicals (stored in tanks on the boiler skid which will be bunded (110%)) to maintain the quality of water required for the steam system. These will be the same dosing chemicals that are currently in use at the site.
- Bulk tank filling and emptying procedures are in place as part of the EMS.
- Cleaning of the production lines involve automated clean-in place (CIP) and manual cleaning.
- Equipment generating emissions will be operated efficiently and will be subject to regular maintenance to ensure optimal operation and to minimise emissions to air.
- Risks of pollution from fugitive emissions from the Installation as a result of the proposed changes are considered unlikely. Measures will be employed to minimise the risk of such emissions.
- A number of activities will intermittently be vented to atmosphere, as detailed below:
    - New sugar truck unloading – storage silo conveying area;
    - Sugar silo in the internally located mixing tower preparation area;
    - Cocoa silo in the internally located mixing tower preparation area; and
    - Skimmed milk power silo in the internally located mixing tower preparation area.

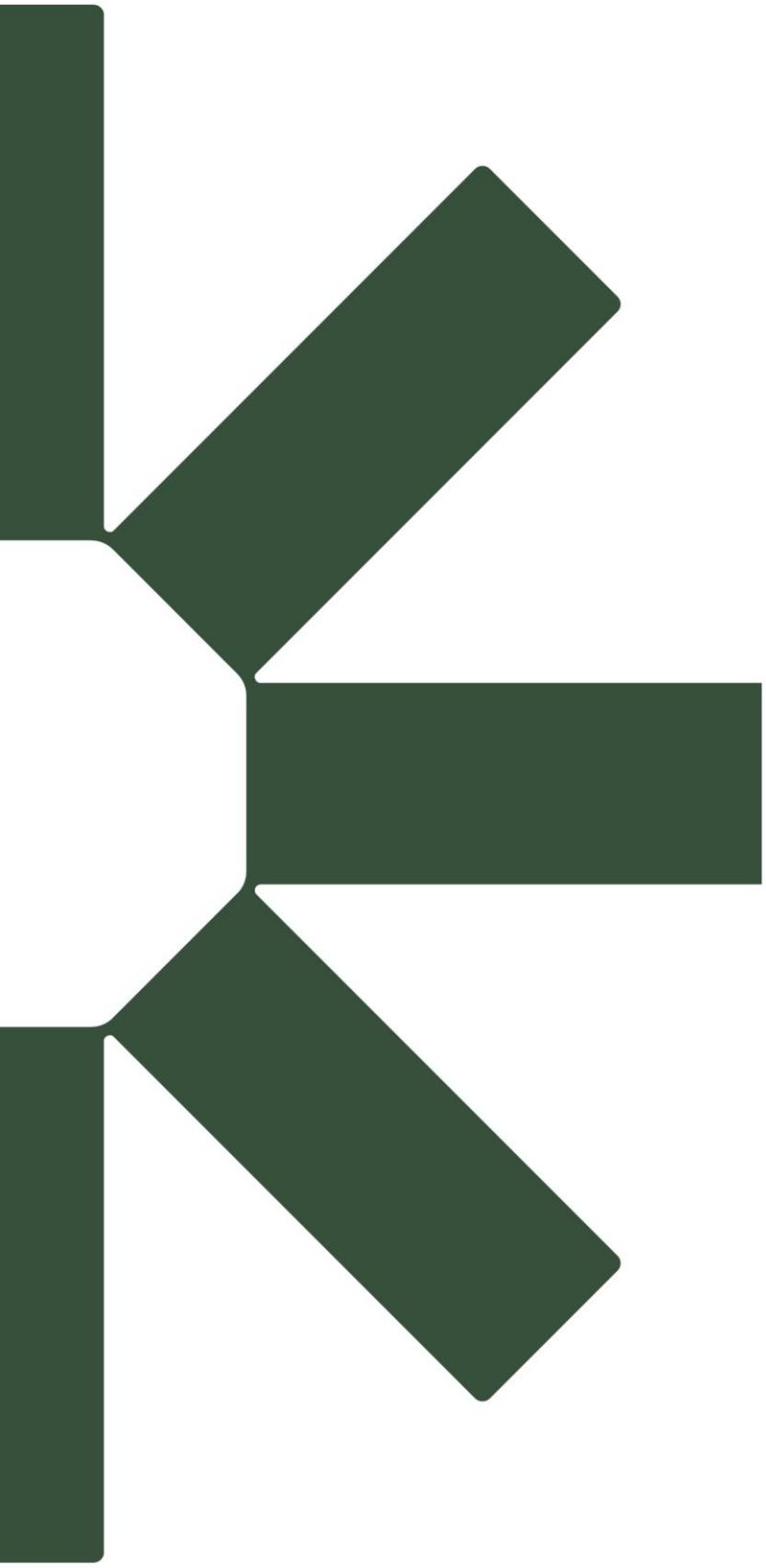
  The vents for these emissions will discharge above roof height. Each vent will have a dust filter. There will be a monitoring system on each of the dust filters; if the dust filter system is not performing the monitoring system will automatically stop the process.
- Thorntons maintains spill procedures, and operating personnel are provided with training in the implementation of the spill procedures. Thorntons has established and maintains an Environmental Incident Response Plan which documents the

emergency response to be implemented in the event of an emergency situation including a spillage/leak.

- The site has appointed a pest control company who regularly visit the site to ensure pest control is adequate. There is a Pest Control Policy in place at the facility.
- Waste materials will be stored within suitable designated containers and disposed of regularly by a suitably licenced waste contractor.
- New plant will benefit from regular preventative maintenance in accordance with the manufacturers requirements which prevents excessive noise from plant in disrepair. Since the site commenced operations in 1985 only one noise-related complaint has been received. This complaint regarded an externally sited chiller unit and was promptly addressed by the installation of an acoustic barrier.
- Thorntons has implemented an EMS and an energy management system and certification of these management systems to ISO14001 and ISO50001 was achieved in May 2021 for ISO14001 and June 2022 for ISO50001.
- In accordance with the EMS, procedures are in place for the regular inspection and maintenance of storage areas and associated infrastructure, including site surfacing, drainage systems and containment measures. Records are maintained of inspection and maintenance activities, and of any accidents or incidents and the action taken to rectify these.

3.0 Conclusion

The overall conclusion from the studies undertaken as part of the EP variation application is that there is unlikely to be a significant environmental impact as a result of the proposed new activities to be undertaken at the Installation. Thorntons is fully committed to ensuring the highest standards are met and will undertake its activities in a manner consistent with best industry practices.



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