Environmental Permit Application Supporting Statement

PB Gelatins Site

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This document acts as the supporting statement for an application for a DAA to an existing environmental permit EPR/DP3030ZC.

Table of Content

1. Introduction

1.1 Background to Application

This document accompanies the application made by Veolia Energy & Utility Services UK Plc for a DAA permit to the existing Environmental Permit EPR/DP3030ZC for the gelatin production installation located at Pontypridd, Rhondda Cynon Taff operated by PB Gelatins.

This application is made under the Environmental Permitting (England & Wales) Regulations 2016. It seeks permit the boilerhouse and its steam generation activity as a Directly Associated Activity (DAA) permit as it is situated within the boundaries of the main site and is technically connected to the gelatin production plant, which recently became permitted under Schedule 1 of the Environmental Permitting Regulations.

The application has been submitted using the NWR Application Forms A, B2, B3 and F1, supplied by Natural Resources Wales via their website. Copies of these forms, completed as necessary, are submitted with this document.

1.2 Boilerhouse Location

The site is located on Severn Road in the Treforest Industrial Estate to the south east of Pontypridd, Rhondda Cynon Taff at approximate OS Grid Reference ST 10190 86860.

The boilerhouse is located within the current permitted boundary to the north of the site. It is identified as the 'boilerhouse' and edged in red on the site plan provided in Appendix A.

2. Activities (Part C3.1)

The boilerhouse operates continuously, 24 hours per day, 7 days per week, 50 weeks per year, though the quantities of steam output vary according to operational factors within the main installation.

There is no discharge of any List I or List II substances from the boilerhouse. There is no discharge of any liquid from the DAA, other than via the effluent collection and treatments systems.

Steam is generated on site using 3 installed boilers to produce dry saturated steam; the boilers operate on natural gas as the primary fuel, and in the case of an interruption in the natural gas supply, each boiler has the ability to use gas-oil as an alternative fuel; a gas oil storage is situated adjacent to the boilerhouse.

The steam is supplied via pipework distribution system to the gelatin production installation, and condensate from this steam is returned for re-use in the boilerhouse as boiler feedwater. Additional boiler feed water is supplied from the water treatment unit (see 2.1.2).

The exhaust gases from the boilers pass into the atmosphere from three 23.8 metres high chimneys, each located next to the boiler they serve (Release Point A1, A2 and A3).

The boilers produce some liquid effluent which passes into the site effluent collections system, from which it is discharged into the on-site effluent treatment plant.

2.1 Details of Plant and Equipment

2.1.1 Boiler Plant

The boiler plant consists of the following:

- Steam boilers no 1 & 2, with a rated thermal input of less than 6 MWth;
- Steam boiler no 3, with a rated thermal input of less than 8 MWth; Boiler no 3 is fitted with an economiser unit to extract additional heat from the exhaust gases.
- Exhaust gases from these boilers are discharged via individual chimneys;
- These boilers normally operate on natural gas; if the gas supply is interrupted; the boilers can use gas-oil as the alternative fuel.

In addition to these main plant items, the boilerhouse is equipped with a range of auxiliary plant and systems that support and enable the overall operations. This includes the following:

- Low voltage electrical switchgear and distribution systems
- Natural gas pipework including shut-off and isolating valves
- Oil storage tank and pipework systems
- Pipework for distribution of fluid materials within the boilerhouse area
- Blowdown system
- Control and monitoring system
- Chemical dosing system

- Pipework for the collection of effluent from the boilerhouse to the on-site effluent treatment plant.

The boilerhouse is in operation at all times outside of the annual 2 weeks shutdown to supply the steam demands of the main installation; individual items of plant may be shut down from time to time for maintenance, but the overall steam output is required continuously by the main installation.

2.1.2 Water Treatment Plant

A water treatment plant purifies mains water to produce softened water for use as feedwater for steam production in the boilers. The water treatment plant consists of 2 ion-exchange units containing resin, together with containers for the salt solutions and feedwater solution.

The backwash of the softening plant produces an effluent flow which passes into the site effluent collections system, from which it is discharged into the on-site effluent treatment plant.

2.2 Emissions Abatement Techniques

2.2.1 Boiler Plant

The boilers release their exhaust gases to atmosphere via individual chimneys located adjacent to each boiler. The exhaust gases from these chimneys contain oxides of nitrogen (NOx) and carbon monoxide (CO); there is also sulphur dioxide (SO_2) in the exhaust gases if the plant is firing on gas-oil. There are no emissions of particulate matter or trace substances.

The three boilers are fitted with dual-fuel burners. There are no techniques or equipment installed to extract or reduce pollutant quantities from the exhaust gas streams. The environmental effect of these releases has been assessed (see section 9) using a dispersion modelling exercise.

The boilers and their auxiliary equipment, together with the water treatment plant, are located within four individual enclosures with concrete hardstanding. Boiler feedwater treatment chemicals including Hydrex 1110 (sodium hydrogen sulphite 30 -50%) and Hydrex 125 (a blend of co polymers and polyacrylates), are stored in plastic containers themselves located within secondary containments to catch and contain any leakage of chemicals. Salt is stored in 20 kg plastic sacks within the boilerhouse.

Adjacent to the boilerhouse there is a steel tank for the storage of gas-oil, which is delivered by road tanker. Deliveries are very infrequent, as gas-oil is rarely used. The fill point is above a small catchment tray in case of minor spillage and is kept secured and locked. Deliveries and discharge of gas-oil are supervised by site staff, and a spillage kit is available for use if necessary. The tank is positioned on a surface of impermeable concrete and surrounded by bund walls of sufficient height to contain in excess of 100% of the total volume of the tank. The bund walls are constructed of concrete blocks. Rainwater is pumped from a sump within the bund, following a site procedure to ensure absence of oil before pumping is carried out.

2.2.2 Storage tanks and containment bunds

Details of the tanks and their pollution abatements measures are given in the table below:

Location	Type of vessel	Contents	Size (m) Volume (m^3)	Fabric of Vessel	Condition	Containment Features
Water treatment enclosure	3 storage tanks	Feedwater treatment chemicals	D = 1.8 m diameter Vol = approx. 1 m^3	Glass Reinforced Plastric	good	Secondary plastic containment – industry standard
Adjacent to boilerhouse	Storage tank	Light fuel oil	D = 3.2m diameter Vol = 50,000 m^3	Steel	Good	Block bund with internal screed finish – 4m high

2.2.3 Effluent discharge

Liquid effluent produced by the boilers passes into the site effluent collections system, from which it is discharged into the effluent treatment plant. There are no measures taken to reduce or abate this discharge to the site effluent collections system.

3. Emissions (Part C3.2)

3.1 Emissions to air

The combustion processes within the boilers result in emissions to air of the following pollutants:

Oxides of Nitrogen (NOx): NOx is formed in the combustion process itself, by the chemical reaction between the oxygen and nitrogen in the combustion air supply. NOx contains predominantly Nitric Oxide (NO), with some Nitrogen Dioxide (NO_2).

Carbon Monoxide (CO): CO arises from partial combustion of the fuel, and is currently released in very small quantities.

Sulphur Dioxide (SO_2): SO_2 is released only during periods of operation on gas-oil as an alternative fuel when supplies of natural gas are interrupted.

Typical quantities of emissions per annum are as follows:

Nitrogen dioxide:	20 tonnes per annum
Carbon Monoxide:	1 tonne per annum

3.2 Emissions to water

The boilerhouse operations do not result in any emissions to water other than for the effluent being discharged to the site sewerage system.

3.3 Emissions to land

Surface water from the partially concreted yard and water runoff from the roof of the enclosures are discharged to the ground.

4. Operating techniques

The techniques used in operating the installation are not complicated, and they do not involve regular control inputs to adjust or regulate their operation. The Directly Associated Activity is designed and operated to consume fuel, electrical power, and water, and to produce steam for supply to the main installation to meet the process requirements. The plant is operated under automatic control for long periods of time at its full rated output, with little change in its operating conditions arising from either site energy demands or external factors. Boiler control and modulation is initiated by the minor variations in steam pressure above and below a pre-set level, which in turn is affected by variations in steam usage on the main installation. Other plant items are switched or modulated automatically according to the appropriate parameters of the process.

Routine operation of the plant is enabled by an extensive system of monitoring and control equipment, together with alarms and protection systems to provide safe start-up and shut-down of individual plant items. Start-up and shut-down of individual combustion plant units is very infrequent, and does not involve higher-than-normal levels of pollutant release when it occurs.

The systems that control all plant and equipment are contained within the site office. There are individual controls systems for each combustion plant and other auxiliary units, to ensure operation within safe prescribed limits and to activate alarm and shut-down procedures in the event of a malfunction. Operation of the plant is also remotely controlled as the plant is unmanned.

4.1 Boiler Plant

Operation of the boiler plant is carried out automatically, based on inputs from sensors and detectors of the relevant key parameters:

- Boiler water level is maintained between upper and lower limits by controlling the pumps and valves that transfer feedwater into the boiler:
- Burner operation is controlled and modulated to maintain steam pressure at the boiler outlet within the upper and lower levels of 10 bar system working pressure;
- Dissolved solids in the boiler water are controlled by use of the blow-down systems, which discharge small quantities of boiler water; this water is then cooled and passed to the site effluent system;
- Steam Purity is controlled by injection of proprietary treatment chemicals in the boiler feedwater system, which assists in dissolving any solids within the boiler water.

- The number of boilers in operation at any time depends on the steam demand.

The boiler controls systems do not have any active function that influences the formation of pollutants in the exhaust gases. Combustion tests are carried out at Quarterly intervals by measuring the exhaust gases conditions and composition; the results of these tests are used to make adjustments to the burner equipment on the boilers.

4.2 Water Treatment Plant

This plant softens the water flow required to top-up the boiler feedwater system, and operates by passing the input water from the mains supply system through the ion-exchange resin columns, where impurities are collected on the surface of the resin. At regular intervals, the ion-exchange column is flushed through with salt solution to flush out the collected impurities and to regenerate the process. The salt solution and impurities are passed into the site effluent collection system. Other than initiating the flushing procedure, the plant operates without any form of process control being required.

5. Raw Materials & Efficient Use Thereof

The following summary identifies the flows of services between the DAA and the main installation:

5.1 Services/Utilities Supplied to the main installation

5.1.1 Dry Saturated Steam

Steam supplies from the boilers are delivered into the PB Gelatins process plant via the distribution pipework connected to the boiler plant.

5.1.2 Effluent and Surface Water

All effluent arising within the DAA is discharged into the site effluent collections system, from which it is discharged into the effluent treatment plant. Surface water from the yard and water run-off from the roof discharge into the ground.

5.2 Services/Utilities Received Directly By the DAA

5.2.1 Natural Gas

Natural gas for fuelling the boilers is supplied at the pipework inlet, which is connected to the national grid gas supply station.

5.2.2 Gas-Oil

Gas-oil (as back-up fuel for) is supplied by road delivery tanker to the inlet point of the main oil storage tank.

5.2.3 Mains Water

Mains water is supplied by underground pipework from the Welsh Water supply system.

5.2.4 Salt (NaCl)

Salt is delivered by road vehicle in 20 kg plastic sacks, and is manually handled and stored within the boilerhouse, adjacent to the water treatment plant.

5.2.5 Feedwater treatment chemicals

Chemicals for the treatment of feed water are delivered by road vehicle and pumped over.

5.3 Services/Utilities Supplied From the main installation to the DAA

5.3.1 Condensate

The condensate is the hot water derived from the main installation usage of steam, and this is returned through the main installation pipework system to the condensate collection vessel within the boilerhouse area.

Other than components and material involved in on-site maintenance activities, the following materials will be delivered, stored, and used as part of the normal operations of the installation:

- Natural gas (not stored)
- Gas-oil

- Mains water
- Condensate
- Granular Salt
- Feedwater treatment chemicals

These materials are all stored within sealed containers to prevent wastage arising from losses or contamination; there is no loss by evaporation from any of these substances.

The utility supplies, i.e. fuel and water, are supplied in accordance with national quality standards; the other materials are provided in accordance with quality and concentration specifications determined by the nature of the processes for which they are used. None of the used materials are rejected or spilled to form wastage, and 100% of the materials are used for their intended purpose; some of the water is discharged from the boiler as effluent, arising from the boilers blowdown and boiler water treatment.

6. Monitoring of emissions

6.1 Boiler Plant

Combustion and emissions tests are carried out quarterly and the test results are used to adjust and optimise the combustion performance of the boilers; this results in minimised releases of carbon dioxide and carbon monoxide in the boiler exhaust gases.

The results of this monitoring generally shows consistent levels of pollutant releases over a long period of time, with little variations in the emissions performance of any of the combustion plants from one monitoring visit to the next.

There is no periodic monitoring of oxides of nitrogen (NOx) or sulphur dioxide (SO_2). There are no continuous or automatic systems installed to monitor the boiler exhaust gases either, and the low impact of pollutants in these gases (see section 9) does not indicate a need or benefit for such monitoring.

6.2 Effluent Discharge

There is not requirement to monitor the discharge of the DAA effluent into the site effluent collection system.

7. Energy Efficiency

The annual energy inputs and consumption of the DAA are typically as follows:

Fuel input	2,046,919 m3 per annum
Electricity consumed	8,034 MWh
Steam Supplied	69,500 tonnes per annum

The above data gives typical boiler efficiency of around 81%.

The use of energy is monitored continuously as part of the operating procedures in place. The boiler plant has been designed and installed with high levels of insulation. Normal operation of the boiler plant incorporates regular checking and inspection of all plant and equipment, to ensure safe and efficient working of the plant; A planned preventative maintenance programme is also operated under which inspections and maintenance activities are carried out regularly, to cover the following:

- Efficient and effective operation of motors, drives, pumps;
- Leakage and control of compressed air systems;
- Effective working, leakage and insulation of steam systems, traps, valves etc;
- Boiler efficiency and combustion testing;
- Minimised consumption of electrical power, by use of controls, timers, etc
- Effective control of boiler blowdown systems.

8. Avoidance of Waste production

8.1 Waste Streams Produced

The boilerhouse generates one liquid waste stream and one solid waste stream as part of its normal operations.

8.1.1 Boiler Plant

This main waste stream consists of a combined flow of liquid effluent, arising from the following sources: Boiler blowdown, water treatment plant backwash and domestic drainage from boiler house enclosure.

The flow rate and composition of this combined effluent flow varies according to normal variations in plant operations, such as boiler output, timing of water treatment operating cycle, ambient weather conditions, etc.

There is no monitoring of the conditions or composition of this effluent flow. The effluent passes into the site effluent collection system.

8.1.2 General/Office/Domestic Wastes

Small quantities of solid waste are generated by normal operations of the installation, such as plastic bags, packaging materials, and office/domestic waste. These materials are disposed of in the appropriate sections of the on-site waste collections systems.

8.2 Recovery and Disposal of Waste Streams

There is no means by which the effluent flow which discharges into the site effluent collection system can escape into other areas of the installation.

9. Environmental Risk Assessment

9.1 Boiler Plant

The impact of the emissions to local atmospheres of Oxides of Nitrogen (NOx), Carbon Monoxide (CO) and Sulphur Dioxide (SO_2) has been assessed by use of a computer-based dispersion modelling system (see Appendix B).

From the modelling results, it can be safely concluded that the boiler emissions are below the thresholds of significance normally applied when fired on gas and do not result in a breach of the Air Quality Standard when fired on oil, and that therefore no abatement measures are appropriate.

There are no direct emissions to land or water, hence no environmental effects in those media.

Only surface water from the yard and water run-off from the roof of the enclosures are discharged to the ground.

9.2 Effluent Discharge

The discharge of effluent passes into the site effluent treatment system and then into the Welsh Water Dwr Cymru (WWDC) sewer (WWDC consent number TE 372) which transports the effluent to the WWDC Cardiff Bay Treatment Plant before discharge into the environment.

9.3 Sources of Noise

The boilerhouse is considered to be inherently quiet with no known noise issues. It is located within the main site and well away from any sensitive receptors in the locality.

There are a number of plant and machinery items within the installation that generate noise as a function of their normal operations, and appropriate measures are in place to suppress the release of noise.

All main sources of machinery noise are all located internally within enclosures. Plant room doors and openings are kept closed, other than when access for personnel and equipment is required.

There have been no instances of complaints received regarding noise produced within the boilerhouse, and no requirements for any monitoring or measurements of noise in the area adjacent to the noise sources in the installation.

Appendix A – Site plan

Appendix B – Air Dispersion Model