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ENERGY AND CLIMATE CHANGE
ENVIRONMENT AND SUSTAINABILITY
INFRASTRUCTURE AND UTILITIES
LAND AND PROPERTY
MINING AND MINERAL PROCESSING
MINERAL ESTATES
WASTE RESOURCE MANAGEMENT



ENDLESS ENERGY LTD

ENDLESS ENERGY FACILITY

NON-TECHNICAL SUMMARY

SEPTEMBER 2018

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SH11087-025	Environmental Permit Boundary
SH11087-030	Site Location

1 INTRODUCTION

1.1.1 Endless Energy Limited plan to build and operate the Endless Energy Facility at Keighley, West Yorkshire. The facility is expected to process 148,800 tonnes of waste a year and generate approximately 11.35MW of electricity net annual average. Waste will be burned on a moving grate and the resultant heat will be used to generate steam to drive the turbine.

1.1.2 The site location and boundary of the permitted area are shown on drawings SH11087-25 and SH11087-30 respectively.

1.1.3 The site is located within a semi-rural setting. The site is bounded by industrial developments to the west, the A650 dual carriageway to the north and east, and a railway line to the south.

1.1.4 The design and operation of the facility accords with all regulatory requirements and relevant guidance. The application shows how all of the requirements of the Industrial Emissions Directive will be met. The plant will be operated in accordance with an ISO 14001 accredited environmental management system to ensure the proper management of the plant.

1.1.5 Comprehensive pollution control measures are in place to protect the environment and the application is accompanied by an Amenity and Accident Risk Assessment, Habitats Risk Assessment, Human Health Risk Assessment and Air Quality Report, demonstrating that the potential impacts from the plant have been identified and properly managed.

1.1.6 The overall application comprises:

- Application Forms:
 - Part A (About You);
 - Part B2 (General Bespoke Permit);
 - Part B3 (New Bespoke Installation Permit);
 - Part F1 (OPRA, Charges and Declarations);
- Non-Technical Summary;
- Site Condition Report;
- Operating Techniques;

- Monitoring Report;
- Best Available Techniques;
- Energy;
- Raw Materials;
- Waste Minimisation;
- Habitats Risk Assessment;
- Amenity and Accident Risk Assessment;
- Odour Management Plan;
- Air Quality Impact Assessment;
- Human Health Risk Assessment;
- Noise Report;
- Fire Prevention Plan;
- CHP Cost Benefit Analysis; and
- Drawings.

2 THE SITE

2.1.1 The Endless Energy Facility will be located at on the edge of the town of Keighley, 12 kilometres to the north west of Bradford. The site is located 15 metres south of the A650, which curves around the northern and eastern edges of the site. The Airedale railway line is located 30 metres to the south of the site, and Gas Works Road is situated 120m to the west.

2.1.2 The site is located 185 metres to the north of the River Aire. The site lies near to a sewage works plant that is located 600m to the east. 450 metres to the north is a cricket club. Pastoral land and woodland are located to the north, east and south of the site beyond Airevale Road and the railway.

2.1.3 The site covers an area of approximately 3.5 hectares. Access to the site is gained by “Marley Road” to the north. Currently the site is a disused and partly demolished gasworks that was in operation for around 90 years. The site is mainly empty and comprises areas of derelict hardstand, some disused buildings and areas of rough vegetation. Further information is provided in the Site Condition Report.

2.1.4 The location and layout of the site are shown on drawings SH11087-025 and SH11087-030.

2.1.5 To the far north of the site, the site is underlain by Quaternary age alluvium (clay, silt, sand and gravel) and mudstone, siltstone and sandstone of the Carboniferous age Millstone Grit Group. The site is underlain by Quaternary age alluvial fan deposits (sands and gravels) and the Carboniferous age High Moor Sandstone to the south. Further information is provided in the Site Condition Report.

3 SITE OPERATIONS

3.1.1 The facility is an energy from waste plant, generating electricity from commercial and industrial wastes.

3.1.2 A Process Diagram of the general waste throughput and overall operations is shown below.

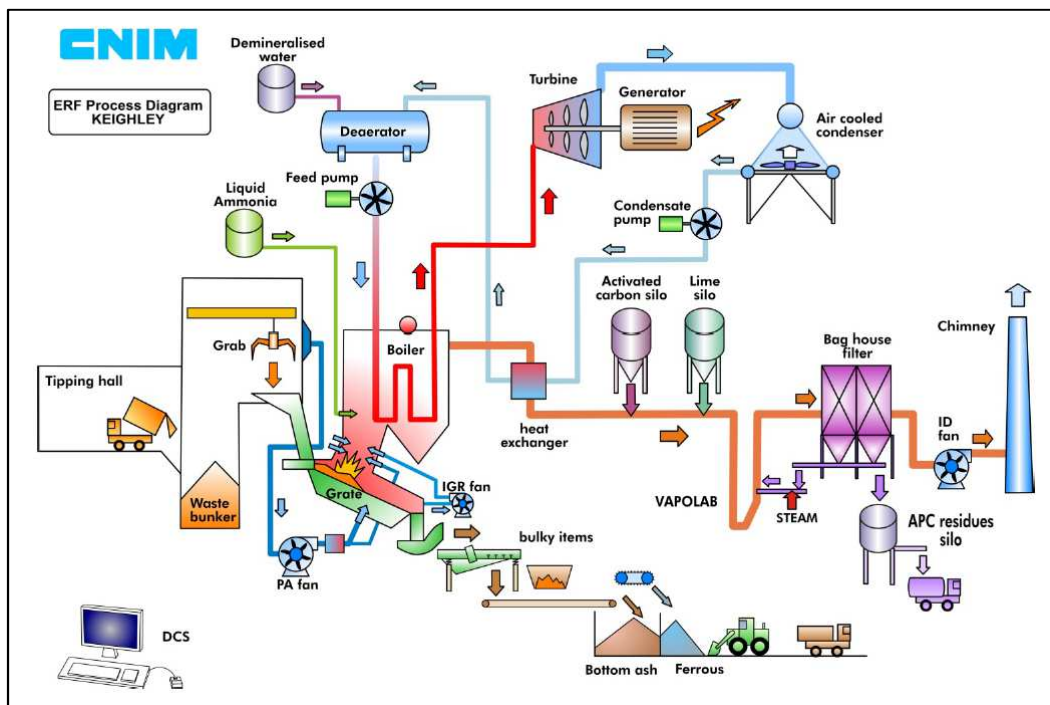


Figure 3:1 Process Diagram

3.1.3 Wastes delivered to the facility will be received in the enclosed waste reception area and stored in an enclosed waste storage bunker.

- 3.1.4 Wastes will be transported from the storage bunker to the hopper by a grab crane operating on tracks running across the width of the bunker building. The crane feeds waste into a water-cooled hopper, which guides the waste onto the first grate section.
- 3.1.5 The waste is initially dried on the first section, and gasified and oxidised on the next section. Burn out is completed on the final grate section, with remaining materials cooled. The gasses complete the combustion process as they pass through the boiler stage of the process.
- 3.1.6 The residual ash falls from the end of the grate and is quenched in a water bath situated under the grate. A conveyor takes the ash from the water bath and discharges it into a storage bunker prior. Ash is treated to remove oversize particles using a vibrating conveyor with a grid. A magnetic separator will remove ferrous metals from the ash.
- 3.1.7 The boiler produces steam at a high pressure and temperature. This is fed into a steam turbine linked to a generator, producing electrical power for use on site and export to the National Grid. Where the steam exits from the turbine it is fed into a condenser where it is cooled and the condensate fed back into the boiler system.
- 3.1.8 Gas cleaning is provided to minimise emissions to air and enable the flue gasses to meet emission standards. Flue gas treatment consists of the use of hydrated lime and activated carbon to reduce the chemical contamination and acidity. Bag filters are used to capture particulates and used reagents before the treated gas is passed to atmosphere via a 60m stack. Gas will pose no threat to human health.
- 3.1.9 The facility will produce electricity but will be CHP ready and will produce a heat supply if and when a local user becomes available. Excess electricity generated at the facility which is not used in the site operations will be exported to the National Grid. The building will also use nominal amounts of electricity generated by the plant.
- 3.1.10 Further information is provided in the Operating Techniques document.

4 INSTALLATION

4.1.1 The installation is defined below.

Table 4:1 Site Activities		
Listed Activity	Description	Annex I and II Activities
Schedule 1 Section 5.1, Part A (1) (b) - The incineration of non-hazardous waste in a waste incineration plant or waste co-incineration plant with a capacity exceeding 3 tonnes per hour.	Incineration of waste utilising a moving grate furnace at a rate of up to 16 tonnes per hour	R1 use principally as a fuel or other means to generate energy.
Directly Associated Activity		Annex I and II Activities
Storage of APCR and bottom ash		D15 storage pending any of the operations numbered D1 to D14
Recovery of ferrous metal from bottom ash and storage of metal pending recycling		R4 recycling and reclamation of metals and metal compounds R13 storage of waste pending any of the operations numbered R1 to R12
Boiler water treatment		R5 recycling and reclamation of other inorganic compounds
Generation of electricity		
Export of electricity to National Grid		

4.1.2 The facility is able to recover energy efficiently and is considered to be a recovery operation. The site R1 calculation has been provided with this application.

4.1.3 It was calculated that the R1 value for the site was 0.74. This exceeds the energy efficiency threshold of 0.65, thus the operation is classed as recovery.

4.1.4 This R1 calculation accounts for the generation of electricity only. The facility will be CHP enabled for potential future uses of heat.

4.1.5 Endless Energy will submit a commissioning plan to the Environment Agency for approval prior to the commissioning of the plant. The requirement for a commissioning plan will be agreed under a pre-operational condition. The plan will summarise the environmental performance of the plant as installed against the design parameters set out in the application. The report will include a review of the performance of the facility against the conditions of this permit and details of

procedures developed during commissioning for achieving and demonstrating compliance with permit conditions.

5 ENVIRONMENTAL RISK AND MITIGATION

5.1.1 All potentially sensitive receptors have been identified and the proposed site operations have been subject to rigorous scrutiny to ensure that all risks have been understood. Further information is provided within the Amenity and Accident Risk Assessment.

5.1.2 The MAGIC website (<http://www.natureonthemap.naturalengland.org.uk>) confirms that there are a number of SSSIs and European sites within 10km of the site.

5.1.3 Three SSSIs are located 2.5km north, 4km south east and 6km south east of the site. The SSSIs are designated due to their flora, fauna and geological importance. Two Local Nature Reserves (LNR) are located 9.4km north east of the site. A Special Protected Area (SPA) is located 2.5km north of the site, providing a habitat for protected bird species. A Special Area of Conservation (SAC) is also located 2.5km north of the site, forming an important area of healthland, blanket bog and oak woodland. A number of habitats and species have been identified as a priority under the UK Biodiversity Action Plan. MAGIC flags the presence of Woodpasture and Parkland BAP Priority Habitat 250m south of the site, and curlew, grey partridge and lapwing within the vicinity of the site. Further information is provided in the Habitats Risk Assessment.

5.1.4 Potentially sensitive receptors may be impacted by the following:

- Particulate matter and dust;
- Plant and equipment failure; and
- Noise and vibration.

5.1.5 Emissions to air will be via a 60m stack, the air quality assessment demonstrates that this will provide sufficient dispersion to maintain air quality within the required standards and fully protect local residents and the near-by Special Area of Conservation (SAC).

- 5.1.6 Waste acceptance procedures are in place to ensure that only residual waste comprising appropriate materials are burned (“Residual waste” is the waste material left after wastes have been sorted to recover recyclate).
- 5.1.7 Waste receipt and handling takes place in a building on impermeable pavement with a sealed drainage system, providing protection to land, groundwater and surface water.
- 5.1.8 Primary control of emissions to air is via careful control of the combustion process to achieve full oxidation of the waste and gaseous products arising from breakdown of the wastes, whilst avoiding conditions in which dioxins, furans or additional nitrogen oxides might form.
- 5.1.9 Abatement for emissions to air include dosing with lime to remove sulphur dioxide, hydrogen chloride and other acid gases, dosing with pulverised activated carbon to remove metals and dioxins, filter bags to remove particulates and use of selective non-catalytic reduction (SNCR) to remove nitrogen oxides by treatment with ammonia or urea. These systems are considered to be the best available techniques (BAT) for the site.
- 5.1.10 A BAT Assessment has been produced for the facility as part of this application. It is a requirement of the Industrial Emissions Directive that listed activities are operated using the “best available techniques” (BAT) for preventing pollution. The report sets out the reasons for the choice of moving grate technology and for the selected abatement technologies, showing why these are the best available technique in this instance. The report also describes the indicative BAT standards set out in the Environment Agency’s Guidance EPR 5.01 and explains how the site will meet these standards.
- 5.1.11 A Fire Prevention Plan (FPP) has been produced for the facility, in accordance with EA guidance, detailing measures to minimise the risk of a fire occurring, ensure fires are dealt with promptly and minimise the spread of a fire. The FPP identifies the site operations that present a risk of fire, the prevention techniques to minimise the potential for a fire, fire suppression techniques and measures to protect the environment in the event of a fire.

5.1.12 A Cost Benefit Analysis has been completed for combined heat and power provision in accordance with EA guidance. Numerous potential heatloads were identified within 15km of the site with only one responding with an expression of interest. Whilst no detail was received from this third party as to the heat demand profile assumptions were made based on published data. This opportunity was considered further and found not to be financially viable at present.

5.1.13 Good housekeeping procedures will be employed on site to prevent odours, litter, dust and vermin. These measures are described in the Operating Techniques document that accompanies this application.

6 ENVIRONMENTAL MANAGEMENT SYSTEMS

6.1.1 Endless Energy Limited will operate the site in compliance with an Environmental Management System (accredited to ISO14001). The Company will have complete control over site operations, maintenance, competence and training, prevention of accidents, document management and records.

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