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Consulting Engineers Limited

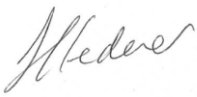
Northacre Facility

Northacre Renewable Energy Limited

Non-technical summary

ENGINEERING CONSULTING

Document approval

	Name	Signature	Position	Date
Prepared by:	Hannah Lederer		Environmental Scientist	24/07/2020
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1 Introduction

Northacre Renewable Energy Limited (NRE) is applying for an Environmental Permit (EP) for the Northacre Facility (the 'Facility') to incinerate incoming residual waste fuel. The Facility will be located at Stephenson Road, Westbury, Wiltshire.

1.1 The Applicant

The Facility is being developed by NRE, a special purpose joint venture established to deliver the Facility. NRE is jointly owned by between Bioenergy Infrastructure Group, a UK independent power producer specialising in energy-from-waste and biomass facilities, and The Hills Group, a Wiltshire-based company with business activities including waste management, quarrying of aggregates and building new homes.

NRE is registered in England is registered in England (Company Number: 07594338) and has a registered address of Davidson House, Forbury square, Reading, RG1 3EU.

1.2 The site

The Facility will be located at land off Stephenson Road in the Northacre Trading Estate, approximately 1.5 km to the north-west of Westbury town centre in Wiltshire. The Facility will be located at an approximate National Grid Reference of ST 85723 52037, with the nearest postcode listed as BA13 4WE.

The site is located on a parcel of land between Arla Foods Westbury Dairies to the north-east and the Northacre Resource Recovery Centre to the south-east. Stephenson Road is immediately north of the site whilst there are fields to the south side of the site. Access to the site is from Stephenson Road, which links via the B3097 to the A350. The A350 provides access in all directions via the primary route network.

The nearest residential properties are two dwellings on Brook Lane to the east, Brook Farm and Orchard House to the south west, and a small number of semidetached houses on Storridge Road to the north-east.

A site location plan and Installation Boundary drawing are presented in Appendix A.

1.3 The activities

The Facility will consist of a single Schedule 1 'Installation Activity' (as defined in the Environmental Permitting Regulations) and Directly Associated Activities (DAAs).

Table 1-1: Environmental Permit Activities

Type of Activity	Schedule 1 Activity	Description of Activity
Installation	Section 5.1 Part A b)	The incineration of non-hazardous waste in a waste incineration plant with a nominal design capacity of 30.9 tonnes per hour
Directly associated activities		
Directly Associated Activities		Waste reception, storage and handling facilities

Type of Activity	Schedule 1 Activity	Description of Activity
Directly Associated Activities		Combustion and energy recovery processes including the export of electricity to the National Grid
Directly Associated Activities		Flue gas treatment
Directly Associated Activities		Residue storage and handling facilities
Directly Associated Activities		Standby electrical generation to provide electrical power to the plant in the event of an interruption in the supply.

The Facility will include the following components: waste reception; waste storage; water, fuel oil and air supply systems; furnace; boiler; steam turbine/generator set; facilities for the treatment of exhaust or flue gases; on-site facilities for storage of residues and waste water; flue with associated stack; and devices and systems for controlling combustion operations and recording and monitoring conditions.

Assuming a design NCV of 10.5 MJ/kg, the Facility will process approximately 243,000 tonnes per annum (at the design capacity of 30.9 tph, assuming 7,860 hours availability).

2 Details of the proposed Facility

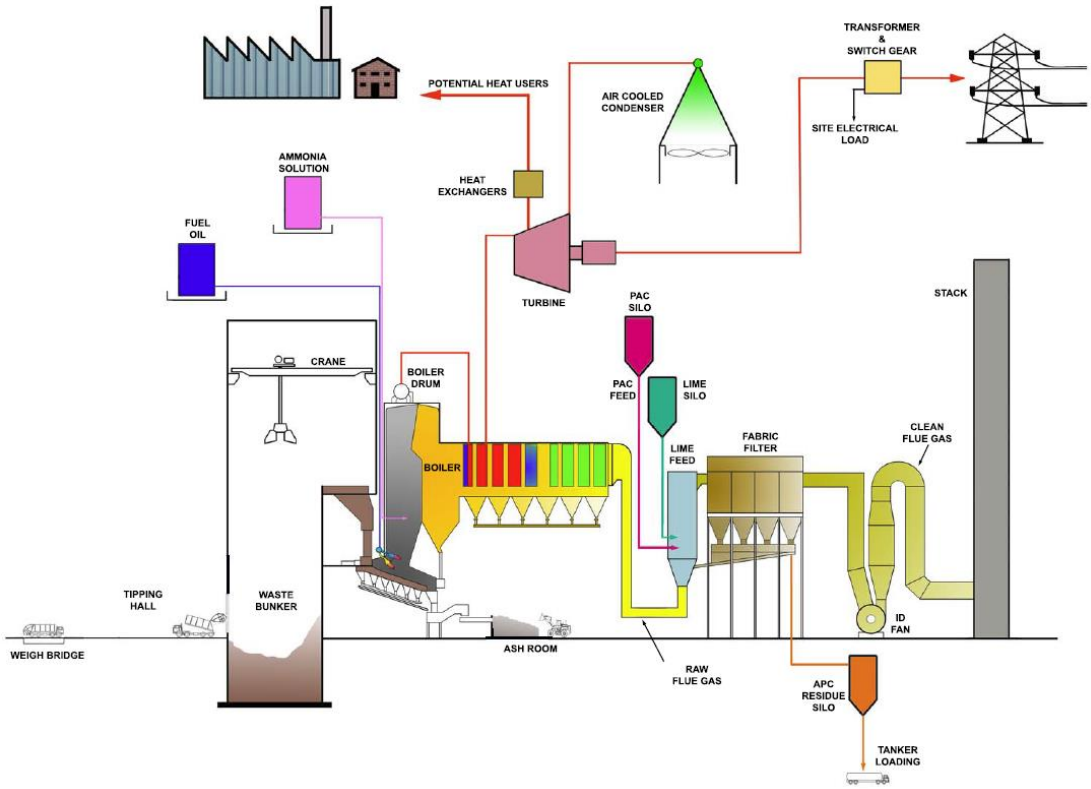
2.1 The process

The Facility will include the following processes:

1. Incoming waste will be delivered to the Facility and unloaded into the waste bunker.
2. Incoming waste would be transferred from the waste bunker into the feed hopper for the waste incineration plant.
3. Emissions of nitrous oxides would be controlled by the injection of ammonia solution into the combustion chamber.
4. Hot gases from the waste combustion would be passed through a boiler to raise steam. The steam would then be passed to a steam turbine to generate electricity for export to nearby users and the National Grid, with the potential to export heat to local heat users.
5. The combustion gases would be cleaned in a flue gas treatment plant. This would include the injection of carbon, primarily to control dioxin emissions, the injection of lime to control acid gas emissions, and the use of a fabric filter to remove dust.
6. The cleaned exhaust gases would be released to atmosphere via a stack of 75 m.

An indicative process diagram for the Facility is presented below.

Figure 1: Indicative Schematic of the Waste Incineration Process



2.2 Raw materials and feedstocks

The Facility will utilise a number of different chemicals and raw materials within the different power plant processes. The chemicals and raw materials used at the site will include, but not be limited to, the following:

- hydrated lime ($CaOH_2$);
- activated carbon;
- ammonia solution;
- mains water;
- non-hazardous mixed waste;
- auxiliary fuel; and
- water treatment chemicals.

These will be supplied to standard specifications offered by different suppliers. All chemicals will be handled in accordance with COSHH Regulations as part of the quality assurance procedures and full product data sheets will be available.

Periodic reviews of all materials used will be made in the light of new products and developments. Any significant change of material, where it may have an impact on the environment, will not be made without firstly assessing the impact and seeking approval from the Environment Agency (EA).

The Operator will maintain a detailed inventory of raw materials used and will have procedures for the regular review of developments in raw materials used.

2.3 Emissions

2.3.1 Emissions to air

Emissions from the Facility will be released from a stack of 75 m. Detailed air dispersion modelling of emissions from the stack has been undertaken and is presented within Appendix E of the application.

The Waste incineration BREF was published by the European IPPC Bureau on 3 December 2019. The Waste incineration BREF introduces BAT-Associated Emission Limits (BAT-AELs) for all 'new plants', i.e. those which are granted an environmental permit after the Waste incineration BREF is published; this includes the Facility. The emission limits proposed within this application are consistent with the BAT-AEL's stated in the Waste incineration BREF.

2.3.2 Emissions to water and sewer

The Facility will include separate drainage systems for foul and surface water.

Surface water run-off will be collected from areas of hardstanding and building roofs and discharged into the surface water drainage systems. Surface run-off from vehicle movement areas will pass through a petrol interceptor. All surface water run-off will discharge into the Northacre Trading Estate drainage system.

Process effluents, which are not able to be reused within the Facility, will be discharged to foul sewer in accordance with a Trade Effluent Consent which will be issued by Wessex Water prior to commencement of operation. Domestic effluents will be discharged to the foul sewer system.

It is understood that the drainage system for the Northacre Trading Estate is designed and constructed as a dedicated network to serve all future highways and individual sites (roofs and paved areas) to be developed within the Northacre Trading Estate. This dedicated sewer network was subsequently adopted by Wessex Water. Furthermore, it is understood that when the Northacre Trading Estate was constructed the detention reservoir at the end of Stephenson Road was designed to provide dedicated storm water attenuation to surface water discharged from all existing, and future, developments within the Northacre Trading Estate.

2.4 Monitoring

There will be continuous monitoring of emissions to air of the flue gases from the Facility. The monitoring system will include monitoring of oxygen, carbon monoxide, hydrogen chloride, sulphur dioxide, nitrogen oxides, ammonia, VOCs, and particulates. Other pollutants will be monitored by spot measurements at regular intervals. All continuous emissions measurements will be recorded, and operators will be alerted if emissions to air approach the permitted limits. The results of all emissions monitoring will be reported to the EA.

The Facility will utilise modern control systems, which incorporate the latest advances in control and instrumentation technology. These systems will optimise the operation of the Facility.

2.5 Ground conditions

A Site Condition Report (Appendix B of the application) has been developed which details the ground conditions at the time of submission of the EP application.

All chemicals will be stored in an appropriate manner to ensure appropriate containment and secondary and tertiary abatement measures where appropriate. The potential for accidents, and associated environmental impacts, is therefore limited.

Deliveries of all chemicals will be unloaded and transferred to suitable storage facilities. Areas and facilities for the storage of chemicals and liquid hazardous materials will be situated within secondary containment, such as bunds. Secondary containment facilities will have capacity to contain whichever is the greater of 110% of the tank capacity or 25% of the total volume of materials being stored, in case of failure of the storage systems.

Tanker off-loading of chemicals will take place within areas where the drainage is contained with the appropriate capacity to contain a spill during delivery.

Upon cessation of the operation of the Facility, a site closure plan will be implemented, and any pollution risks will be removed from the site. The ground will be returned to a ‘satisfactory state’.

2.6 Technology selection

The processes have been designed against the background of a detailed assessment of the prevailing environmental conditions at the site location, in order that the objectives of the Industrial Emissions Directive (IED) are met. Best Available Techniques will be employed at the Facility to minimize its impact upon the local environment.

A quantitative BAT Assessment has been completed for the Facility – refer to Appendix F of the Application. This has demonstrated that the proposed techniques to be employed at the Facility will represent BAT in accordance with the relevant BAT guidance notes.

The following techniques are proposed to be employed at the Facility:

- SNCR with ammonia solution for the abatement of oxides of nitrogen;
- A moving grate for the combustion of waste;
- A dry system for the abatement of acid gases; and
- Lime to be used as a reagent for the abatement of acid gases.

2.7 Residues

The main solid residue streams arising from the Facility are:

1. Incinerator Bottom Ash (IBA); and
2. Air Pollution Control residues (APCr).

It is intended that the IBA from the Facility will be transferred to an off-site IBA processing facility. If a suitable recovery facility will not accept the residue, it may be transferred for disposal in an off-site non-hazardous landfill.

APCr is classified as hazardous and requires specialist disposal or treatment. It may be possible to send the residue to a waste treatment contractor, to be used to neutralise acids and similar materials. Using the residues in this way avoids the use of primary materials. If these options are not available, the APCr will be sent to a suitably licensed hazardous waste landfill for disposal as a hazardous waste.

2.8 Management

To ensure effective management of the Facility, NRE will develop a documented management system that clearly defines the management structure for the Facility, as well as setting out the roles and responsibilities of all staff.

Bioenergy Infrastructure Group (one of the joint owners of NRE Ltd) currently operates all of their operational waste incineration facilities in accordance with documented management systems, certified to ISO:1400Refer t1 standard. NRE proposes to extend the existing management systems to create a documented management systems to include for the operation of the Facility.

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