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Consulting Engineers Limited





**GENT FAIRHEAD & CO LIMITED  
RIVENHALL IWMF  
NON-TECHNICAL SUMMARY**

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## 1 INTRODUCTION

### 1.1 The Application

Gent Fairhead & Co Limited is proposing to construct and operate the Rivenhall Integrated Waste Management Facility (IWMF). The Rivenhall IWMF (herein referred to as the Installation) will be located at the former RAF Rivenhall Airfield site. The Installation will comprise the following treatment processes:

- A Materials Recycling Facility (MRF);
- An anaerobic digestion (AD) facility;
- A Mechanical Biological Treatment (MBT) facility;
- A De-inked Paper Pulp Production Facility (Pulp plant);
- Combined Heat and Power (CHP) Plant; and
- Wastewater treatment (WWTP) plant.

To be able to operate the facility, an Environmental Permit (EP) will be required from the Environment Agency (EA). This document is a Non-Technical Summary of the information submitted in support of the EP application.

The proposed treatment processes at the Rivenhall IWMF will be covered by two applications, namely: a permit application to cover the integrated operations of the MRF, MBT, Pulp plant, CHP and WWTP; and, a standard rule's permit application to cover the operation of the AD, within the confines of the IWMF buildings.

The IWMF permit(s) will cover all integrated operations within the Installation at Rivenhall Airfield.

### 1.2 The Site

The Rivenhall IWMF is located on the southeastern edge of a World War II airfield known as Rivenhall Airfield between the villages of Bradwell (northwest 2.6 km), Silver End (southwest 1.1 km), Rivenhall (south 2.3 km), Coggeshall (northeast 2.8 km) and Kelvedon (southeast 3.4 km).

Access to the site will be provided via a private access road from the existing A120.

The former airfield and its immediate surroundings are on a plateau above the River Blackwater. This plateau is currently being excavated and, therefore, under the current planning permission, half of the old airfield will become a restored 'bowl' for continued agricultural use. The airfield was open and exposed and had been used predominantly for agricultural purposes, although extensive sand and gravel extraction and restoration has been undertaken at the site.

The nearest residential properties within 1 km of the Site are: The Lodge, Allshotts Farm, Bumby Hall, Sheepcotes Farm, Green Pastures Bungalow, Goslings Cottage, Goslings Barn, Goslings Farm, Deeks Cottage, Heron's Farm, Haywards, and Park Gate Farm Cottages.

### 1.3 The Application and the Listed Activities

There will be six principal activities undertaken at the Installation, (1) Combined Heat and Power (CHP) Plant; (2) Materials Recycling Facility (MRF); (3) anaerobic digestion (AD) facility; (4) Mechanical Biological Treatment (MBT) facility; (5) A De-inked Paper Pulp Production Facility (Pulp plant); and (6) Wastewater treatment plant (WWTP). The capacities of the treatment processes are as follows:

- (1) The CHP plant will have a maximum design capacity to process up to 595,000 tonnes per annum of non-hazardous Solid Recovered Fuel (SRF)<sup>1</sup> and Refuse Derived Fuel (RDF), herein referred to as RDF;
- (2) The MRF will have a maximum design capacity to process 300,000 tonnes per annum of direct waste and treated waste materials from the MBT to recover recyclates for transfer off-site, with the residual material being transferred to the CHP facility;
- (3) The AD plant will be designed to process up to 30,000 tonnes per annum of food and organic waste, with the resultant biogas being combusted in a biogas engine;
- (4) The MBT Plant will have a maximum design capacity to process 170,000 tonnes per annum of waste to produce a biologically dried output that will be fed into the MRF to recover recyclates. The resultant output from the combined operations will be a non-hazardous RDF to be treated as a fuel within the CHP plant.
- (5) The Pulp plant will have a maximum design capacity to process 170,000 tonnes per annum of waste paper to produce approximately 85,500 tonnes per annum of recycled and reusable paper pulp; and
- (6) The Wastewater Treatment Plant will have a maximum design capacity of 550,000 m<sup>3</sup> per annum of wastewater from the installation.

### 1.3.1 CHP plant

The CHP facility will combust waste comprising predominantly RDF from off-site satellite waste treatment facilities, some RDF produced by the on-site MRF and MBT, and some biological residues from the WWTP. The CHP plant will produce electrical power for use in the CHP plant and other on-site process with excess exported to the local distribution network. Heat will be exported as steam and hot water to on-site processes and for space heating.

The CHP facility will consist of two combustion lines. The thermal capacity of each boiler will be 92 MWth giving a total thermal capacity of the CHP facility of 184 MWth. The CHP facility will be designed to accept RDF with a NCV design range of circa 7-13 MJ/kg. Fluctuations in the delivered NCV will lead to variations in the mass throughput of waste.

The CHP facility will be able to generate up to 50 MWe. With the AD plant in operation and generating 1 MWe, the CHP plant will be limited to 49 MWe. Normal export is expected to be around 28 MW.

The maximum waste input capacity of the CHP facility is 595,000 tonnes per annum.

### 1.3.2 MRF

The purpose of the MRF is to identify and recover recyclates from incoming untreated Municipal Solid Wastes (MSW) and Commercial & Industrial (C&I) wastes, from the shredded and biologically dried output from the MBT plant, and if possible and appropriate to recover further recyclates from incoming refuse derived fuel (RDF) (or solid recovered fuel (SRF)). As the predominant output by volume from the MRF will be RDF destined for the CHP plant, the MRF is deemed to be an RDF manufacturing and/or refinement process. All RDF manufactured at the installation will be transferred to the CHP plant.

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<sup>1</sup> The planning permissions states as an *Informative* "reference to Solid Recovered Fuel (SRF) for the purposes of this planning permission is considered to be the same as Refuse Derived Fuel (RDF)."

The MRF is designed to both mechanically and manually sort recyclable materials from the incoming waste. The identification and separation processes are achieved initially through a mechanical process and subsequently through a manual process for final quality control.

The MRF processing facility is divided into two lines:

- (1) Line 1 is for processing the material that comes from the MBT bio-drying vessels.
- (2) Line 2 is for processing material that generally comes direct into the facility having undergone no or minimal pre-treatment by way of recycle removal.

### 1.3.3 AD plant

The anaerobic digestion (AD) process will comprise a wet pre-treatment and anaerobic digestion system. This is considered to be a proven technology for the proposed waste feedstock, which will comprise separately collected municipal or commercial food wastes and/or other green wastes, referred to as mixed organic waste. The AD plant has been applied for as a separate standard rules EP (SR2012 No12).

### 1.3.4 MBT

The purpose of the MBT Facility is to receive collected municipal or commercial wastes that require some pre-treatment in order to remove moisture and recyclates (in combination with the adjacent MRF) and to manufacture a RDF suitable for energy recovery in the CHP plant. The MBT may also be employed when appropriate to biologically dry and moisture condition incoming RDF prior to energy recovery in the CHP plant.

The MBT process is designed to take in organic rich materials that are treated in a series of enclosed vessels. The vessels include individual floor and roof systems that provide for air to be forced through the waste to facilitate the process of biological drying.

The MBT process is modular with each vessel being rectangle in shape. The MBT process is designed for the treatment of up to approximately 170,000 tonnes per annum of waste through the process utilising eight lines with two vessels in each line. The waste will be loaded into each vessel by a front-end loading shovel.

The waste will remain in the vessels for a minimum of 7 days enabling the biological process to occur, during which time the waste will lose up to 12% moisture content. This enables easier extraction of recyclables, particularly plastics and metals, within the mechanical processes in the MRF.

### 1.3.5 Pulp plant

The Pulp plant would be capable of recycling up to 170,000 tpa of recovered printing and writing paper and card, to produce 85,500 tpa of recycled paper pulp which will be transported off-site and used to predominantly manufacture printing and writing paper, white surface packaging and some tissue.

The Pulp plant has been designed and configured to produce recycled pulp suitable for use in the manufacture of writing or printing paper. To achieve this, the quality and purity of the paper and card feedstock imported to the Site must comply with a recognised specification. This would provide the Pulp plant with raw materials suitable for the washing, cleaning, bleaching, mixing and drying operations required to produce the recycled pulp.

Grades (defined by EN643) within High Grade Recovered Paper (RCP), specifically sorted office papers and "white letter" which are largely post-consumer and uncoated papers, and Multigrade (printer waste) which are largely pre-consumer will be sourced as a feedstock for the Pulp plant.

### 1.3.6 Wastewater treatment plant

The wastewater treatment plant (WWTP) will consist of the following seven treatment stages:

- (1) course and fine screens;
- (2) roughing and polishing dissolved air floatation (DAF);
- (3) lime soda softening;
- (4) sand filtration;
- (5) membrane treatment – reverse osmosis;
- (6) DAF and precipitator sludge collection; and
- (7) dewatering.

The treated water from the wastewater treatment plant will be transferred and stored in the on-site storage lagoon(s) for reuse as process water within the Installation.

The WWTP will treat only wastewater effluent from the Pulp plant within the IWMF. It will not treat wastewaters from external processes off site.

## 2 DETAILS OF THE PROPOSED FACILITY

### 2.1 Raw Materials and Feedstocks

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

- (1) hydrogen peroxide;
- (2) sodium hydroxide;
- (3) sodium silicate
- (4) lime;
- (5) activated carbon;
- (6) ammonia solution;
- (7) gas oil;
- (8) recycled paper; and
- (9) hydrochloric acid solution.

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 EA.

Gent Fairhead & Co Limited will maintain a detailed inventory of raw materials used at the Installation and will have procedures for the regular review of developments in raw materials used within the different waste treatment processes.

### 2.2 Emissions

#### 2.2.1 Emissions to Air

All point source emissions to air, except for the AD flare, will be released from the main stack, which is 55m above the existing surrounding ground level. Detailed air dispersion modelling of emissions from the stack has been undertaken, which has demonstrated that the impact of emissions to air will not have a significant impact on local air quality.

All emissions to air will comply with any relevant emission limits in the IED and other relevant Air Quality Guidance.

#### 2.2.2 Emissions to Water

The Installation will give rise to surface water run-off from roads, vehicle parking areas, building roofs, hard-standings and hard landscaped areas. Surface water run-off from these areas will be discharged into the Upper Lagoon. The lagoon will be used for the storage of water to be used as process water within the installation.

There will not be any discharges of process effluent to water from the Installation. The facility has been designed as a 'Zero Liquid Discharge' facility.

- Water for use within the IWMF will be pumped from Upper Lagoon and fed into the Pulp Plant to support and supplement the Installation's Zero Liquid Discharge (or Closed Loop) wastewater treatment system.



- Water from the Pulp Plant, together with water from the other processes within the Installation, will be cleaned and treated to an exceptionally high standard through the WWTP.
- Allowing for water losses through the WWTP cleaned and treated water will be recirculated and reused within the Pulp Plant or the nearby lagoon network to provide a Zero Liquid Discharge (or Closed Loop) wastewater treatment system.

### 2.2.3 Emissions to Sewer

There will be no discharges to sewer from the Installation.

### 2.2.4 Odour

The installation will be operated in accordance with an odour management plan.

## 2.3 Monitoring

There will be continuous monitoring of emissions to air from the CHP plant for oxygen, carbon monoxide, hydrogen chloride, sulphur dioxide, nitrogen oxides, ammonia, VOCs, and particulates will be undertaken for the flue gases from the CHP plant. 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.

Monitoring of emissions from the AD gas engines will be undertaken in accordance with the requirements of the standard rules EP.

The results of all emissions monitoring will be reported to the EA.

Solid residues generated by the plant will be sampled on a regular basis to assess bottom ash burnout and to monitor the levels of specified pollutants.

Process monitoring will be undertaken for each of the waste treatment processes. All processes will utilise modern control systems, which incorporate the latest advances in control and instrumentation technology. These will be used to control operations and optimize the waste treatment processes.

## 2.4 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 Installation to minimize its impact on the local environment.

Qualitative BAT Assessments have been undertaken for all waste treatment processes, and quantitative BAT Assessments have been completed for the CHP Plant. These have demonstrated that the proposed techniques to be employed at the Installation will represent BAT in accordance with the relevant BAT guidance notes.

## 2.5 Management

To ensure effective management of the installation, Gent Fairhead & Co Limited will develop a documented management system that clearly defines the facility's management structure, as well as setting out the roles and responsibilities of everyone working at the installation.



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