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Consulting Engineers Limited

Drumgray Energy Recovery Centre

FCC Recycling (UK) Ltd

Non-Technical Summary

ENGINEERING CONSULTING

Document approval

	Name	Signature	Position	Date
Prepared by:	[redacted]	[redacted]	Environmental Scientist	25/10/2019
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1 Introduction

FCC Recycling (UK) Ltd (FCC) is proposing to build an Energy Recovery Centre (ERC) alongside a Mechanical Pre-Treatment Facility (MPT), herein referred to collectively as the Drumgray Energy Recovery Centre (DERC). The DERC will be located on the wider Greengairs Waste Management Complex which includes the Greengairs Landfill Site, in North Lanarkshire, Scotland, and will receive incoming non-hazardous waste.

1.1 The Applicant

FCC Recycling (UK) Ltd is a subsidiary of FCC Environment Limited – one of the UK's leading waste and resource management companies – and is the Applicant for the DERC. FCC Recycling (UK) Ltd is registered in England (Company Number: 02674166) and has a registered address of Ground Floor West, 900 Pavilion Drive, Northampton Business Park, Northampton, NN4 7RG.

FCC operates a number of waste management sites including material recycling facilities, energy from waste plants and landfill sites. FCC operates a number of Energy Recovery Centres in the UK, including the Millerhill ERC near Edinburgh.

FCC will be responsible for the day-to-day operation of the DERC. FCC will retain overall control and ownership of the DERC, and therefore, for the purposes of the PPC permit, FCC will be the Operator.

1.2 The Site

The Site is located on land at the southwestern edge of the wider Greengairs Waste Management Complex which includes the Greengairs Landfill Site. The Site location is approximately 2.3km northeast of Airdrie in North Lanarkshire, Scotland. The National Grid Reference of the site is approximately NS 78550 68674. The villages of Wattston and Greengairs lie approximately 1.4km and 1.7km north from the proposed ERC respectively.

The wider Greengairs Waste Management Complex covers an area of land approximately 283 ha and is owned entirely by FCC. The area for the proposed ERC comprises approximately 4.65 ha of land, whilst the area for the proposed MPT would comprise approximately 4 ha of land.

Once operational, the DERC will be accessible via a private access road running east-west between Meikle Drumgray Road and the B803, to the south of Wattston.

1.3 The Activities

Activities covered by this application include:

1. mechanical pre-treatment of waste to recover recyclates and produce a waste-derived fuel;
2. single-line waste incineration plant processing incoming waste delivered to the ERC from either the adjacent MPT or directly to the ERC in the case of pre-sorted waste;
3. generation of power for export to the National Grid, and the potential for heat export to local heat users;
4. production of an inert bottom ash material that will either be transferred off-site to a suitably licensed waste treatment facility for recovery/disposal or treated on-site; and
5. generation of an air pollution control residue that will be transferred to a suitably licensed hazardous waste facility for disposal or recovery.

The MPT would allow for the recovery of ferrous metals, non-ferrous metals, hard plastics and non-combustibles. The MPT process would comprise a series of conveyors with mechanical sorting equipment, such as screens and automatic sorters.

The ERC will comprise waste reception; waste storage; a single waste incineration line; water, fuel oil and air supply systems; waste furnaces; boilers; steam turbine/generator set; facilities for the treatment of flue gases; on-site facilities for treatment or storage of residues and waste water; a flue contained within a stack; an air cooled condenser unit; and devices and systems for controlling combustion operations and recording and monitoring conditions.

2 Details of the DERC

2.1 Mechanical Pre-Treatment Facility (MPT)

The nominal design capacity of the MPT would be approximately 43 tonnes per hour of waste, with an availability of 16 hours per day, 6 days per week and 48 weeks per annum. Therefore, the nominal design capacity of the MPT is up to 200,000 tpa of non-hazardous waste. Recyclables will be extracted from the waste and transported off-site to appropriate reprocessing facilities. The residual waste left after processing in the MPT would be transferred to the ERC for energy recovery – it is anticipated that up to 190,000 tpa of waste would be transferred directly from the MPT to the ERC. Any reject material not capable of being recycled or processed in the ERC will be transferred off-site to a suitably licensed waste management facility.

The MPT is subject to further detailed design, however, the main processes are summarised as follows:

- Waste will be fed into a hopper which utilises a bag-opening and shredding techniques to produce approximately a 300mm output.
- A trommel screen will produce two fractions from the waste stream: <120mm and >120mm.
- Both streams will undergo segregation of plastics through the use of optical separation techniques.
- Both streams will pass via -band electromagnets to extract ferrous metals.
- The <120mm fraction will also pass via an eddy current device to extract aluminium.
- The residual fraction, following recovery of dense plastics and metals would be transferred to the ERC for thermal treatment.
- During periods of shutdown of the ERC, waste would be diverted away from the MPT to a suitably licensed waste management facility.

2.2 Energy Recovery Centre (ERC)

The nominal design capacity of the ERC will be approximately 37.5 tonnes per hour of non-hazardous wastes, with a net calorific value (NCV) of 9.5 MJ/kg. The ERC will have a nominal design capacity of approximately 300,000 tonnes per annum (tpa), assuming an availability of approximately 8,000 hours. Up to 190,000 tpa of this waste will be transferred directly from the MPT, with approximately 110,000 tpa delivered directly to the ERC.

However, allowing for variations in the NCV of the waste and the maximum hourly tonnage, the maximum capacity of the ERC will be approximately 333,600 tpa.

The turbine has been designed to generate up to 30 MWe of electricity (design maximum) with a site parasitic load of approximately 4 MWe for the site (comprising approximately 3MW for the ERC and 1MW for the MPT). The ERC will therefore export up to 26 MWe to the national grid. However, should the MPT be removed from consideration, the ERC will be able to export up to 27MWe.

In outline the waste incineration process would be as follows:

1. Incoming waste will be delivered to the ERC (either directly or from the MPT) and unloaded into the waste reception bunker.
2. Fuel will be transferred from the waste bunker into the feed hopper for the boiler.
3. The boiler will utilise a conventional moving grate combustion system.

4. Residues from the combustion chamber would be removed via a water quench to contain dust releases and provide a gas seal.
5. Emissions of nitrogen oxides would be controlled by the injection of ammonia solution into the combustion chamber.
6. 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 the National Grid and potential for the export of heat to local users. At the time of submission of the application, there are no formal heat export contracts in place.
7. 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.
8. The cleaned exhaust gases would be released to atmosphere via a stack.

2.3 Raw Materials and Feedstocks

The DERC will utilise a number of different chemicals and raw materials. The chemicals and raw materials used on site will include, but not be limited to, the following:

1. Incoming waste;
2. Low sulphur fuel oil;
3. Ammonia;
4. Lime;
5. Powdered Activated Carbon (PAC); and
6. Boiler 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 SEPA.

In accordance with the management systems for the DERC, FCC will maintain a detailed inventory of raw materials used and will have procedures for the regular review of developments in raw materials used.

2.4 Emissions

2.4.1 Emissions to Air

Emissions from the ERC will be released from a 90 m stack. Detailed air dispersion modelling of emissions from the stack has been undertaken and is presented in Appendix D of the Supporting Information.

Emissions to air from the ERC will comply with the BAT AELs in the Final Draft Waste Incineration BREF. Example emissions monitoring data is presented in Appendix I of the Supporting Information. This demonstrates that the proposed abatement technologies are capable of achieving the required emission limits.

2.4.2 Emissions to Water and Sewer

The DERC will give rise to surface water run-off from roads, vehicle movement areas, building roofs and hardstanding areas. Surface water will be discharged into surface water drainage systems at the ERC and MPT. An interceptor will remove oils and sediments from surface runoff from roads and areas of hardstanding. The surface water will have an eventual discharge into the Cameron Burn.

There will be no discharge of process effluents to sewer from the ERC – these will be reused within the process or, should excess process effluent be generated, tankered and transferred off-site for treatment. Process effluent from the MPT (e.g. from washdown) will be tankered and transferred off-site for treatment.

There will be no discharge of foul water to sewer from either the MPT or ERC.

Indicative water schematics for the DERC are presented in Appendix A of the Supporting Information.

2.5 Monitoring

There will be continuous monitoring of emissions to air from the ERC for 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 or exceed the permitted limits.

The results of emissions monitoring will be reported to SEPA in accordance with the requirements of the PPC permit.

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

The ERC 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 operation of the Facility.

2.6 Ground Conditions

An Initial Site Report (Appendix B of the Supporting Information) has been developed which explains the ground conditions at the time of submission of the PPC application.

All chemicals will be stored in an appropriate manner incorporating the use of suitable secondary and other measures (such as acid and alkali resistant coatings) to ensure appropriate containment and tertiary abatement measures.

All storage facilities for chemicals will be designed in accordance with Pollution Prevention Guidance PPG 2, PPG 3 and PPG 18. 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. 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 loading and off-loading will take place within areas where the drainage is contained with the appropriate capacity to contain a spill during delivery.

Upon cessation of the activities on site, a Closure Plan will be implemented. Any pollution risks will be removed from the site, and the ground will be returned to a 'satisfactory state'.

2.7 Technology Selection

Best Available Techniques will be employed for the Facility to minimize its impact on the local environment. A quantitative BAT Assessment has been completed for the Facility, and is included in Appendix E of the Supporting Information. This has demonstrated that the proposed techniques to be employed at the Installation will represent BAT in accordance with the relevant BAT guidance notes.

2.8 Residues

The main residue streams arising from the MPT are:

1. Hard plastics;
2. Metals (ferrous and non-ferrous); and
3. Incombustible residual material.

The main residue streams arising from the ERC are:

1. Incinerator Bottom Ash; and
2. Air Pollution Control residues.

Recyclates from the MPT would be transferred to a suitable recycling facility for recovery, whilst any residual incombustible material will be transferred to a suitably licensed waste management facility.

It is anticipated that IBA will be transferred off-site to a suitable IBA processing facility. APCr will be transferred off-site to a suitably licensed hazardous disposal facility.

2.9 Management

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

ENGINEERING CONSULTING

FICHTNER

Consulting Engineers Limited

Kingsgate (Floor 3), Wellington Road North,
Stockport, Cheshire, SK4 1LW,
United Kingdom

t: +44 (0)161 476 0032
f: +44 (0)161 474 0618

www.fichtner.co.uk