



## APPENDIX 12

# REPORT ON POTENTIAL HEAT EXCHANGE PROJECT

# APPENDIX 12 – INFORMATION ON POTENTIAL FOR USE OF THE HEAT GENERATED BY THE WASTE TREATMENT PROCESS

## Pre Operation Measure PO08

*The operator shall carry out and submit in writing to the Agency a comprehensive review of the options available for utilising the heat generated by the waste incineration process in order to ensure that it is recovered as far as practicable. The review shall detail any identified proposals for recovering and utilising heat as far as possible and shall provide an implementation timetable.*

## Background

Veolia has issued various documentation in recent years regarding the utilisation of the heat generated by the waste treatment process. These are detailed below:

- **VES responses as part of the Environmental Permit application**
- **VES submission to discharge Planning Condition 49. This condition was discharged by Shropshire Council on 17 May 2012.**

The submission for planning condition 49 recognised that the development of heating network is a complex undertaking and proposed a Road Map to achieve this.

The Road Map emphasised the iterative nature of the negotiation and commercial / technical design process that is required to deliver an optimised solution for the Battlefield installation. It also highlighted that flexibility was necessary as an essential part of the district heating delivery process because the technical design (which forms the basis of the commercial model) is predicated upon certain heat loads and as negotiations progress with core customers and other potential heat users in the area, the viable extent of the network and heat sales volumes will change, and the commercial viability of connecting different users will likewise change.

The Permit Decision Document section B3.2 last paragraph indicated that the development of district heating or heat use would involve significant technical, financial and planning challenges.

The EWF has been designed to achieve R1 recovery in accordance with Waste Framework Directive.

## Heat Load Review

As part of an initial review, the focus has been on identifying anchor heat loads in the local vicinity of the EWF and to try to kick start the development with a lower cost base as the development capital costs of these schemes and their networks are high. The businesses/buildings in the vicinity of the EWF include car dealerships and garages (Shrewsbury Mercedes, Shukers Landrover, Honda Centre, BMW, etc.), supermarkets, colleges, Stadco, ABP, etc. The majority of these buildings are likely to have an existing decentralised heat supply structure and hence the migration costs to supply heat need to be competitive in comparison to heat from fossil fuel sources. Large fossil fuel users may also have alternative environmental drivers to adopting district heating in addition to fuel cost.

In addition, the area is separated by the railway line, so that property owner issues and access would need to be resolved to enable a development to commence. Any crossing underneath the railway would need to be considered at an early stage as this would be a complex project requiring Network Rail consent.

Heat customers connecting to a district heating network or process steam system typically need to:

- **be close to the ERF thereby minimising capital costs and operating costs of the district heating flow and return pipework**
- **have a centralised heating system to minimise capital costs associated with building retrofits to allow a district heating connection**
- **have a near constant heat demand and/or steam temperature requirement**
- **achieve commercial terms over a longer period.**

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Suitable heat loads for such systems are generally provided by large centralised buildings such as blocks of flats, municipal and commercial buildings (offices, leisure centres, swimming pools, hospitals) or by suitable industrial facilities requiring steam for various processes. The retrofitting of district heating into individual residential properties is generally far too costly.

### Technical

It is anticipated that  $\sim 3\text{MW}_{\text{th}}$  of district heating could potentially be provided by Battlefield EWF. The steam turbine, as installed, is fitted with a connection point for the extraction of steam which could provide heat for industrial use or to supply a district heating system. An underground conduit is being installed to enable the steam/hot water to be routed to the north side of the transfer station to facilitate potential future development, and avoid site disruption to waste vehicles.

Any steam extracted from the turbine will reduce the electrical power generated. Therefore, to realise the potential environmental benefits of heat use, users would need to be identified who would represent a constant base heat load at lower steam conditions.

District heating agreements between the supplier and the consumer, usually require high degrees of availability as a principle requirement and usually imposes high penalties on the supplier for unavailability of the service. This means that not only are the heat exchange and pumping systems, network pipework and end user control panels required but a dedicated back up service is also required in order to maintain the supply of district heating in the event of loss of steam supply, (during planned and unplanned shutdowns of the waste boiler). This dedicated back up service often takes the form of fossil fuelled boilers, which are kept in a state of readiness to respond and maintain the district heating supplies in the event of loss of normal steam supply.

### Opportunities

Veolia is exploring other opportunities with local businesses and amenity providers. Currently we are in discussions with certain heat consumers including ABP, and some have visited the Veolia's ERF at Four Ashes as part of their investigations into the use of heat from facilities of this type. Discussions still continue and Veolia remains hopeful that technical and commercial solutions can be developed to identify anchor heat loads.

There are potential opportunities to use low grade heat for heating of market gardening polytunnels or swimming/recreation facilities.

Once the EWF becomes operational in 2015, it will represent a significant heat source within the area. This is anticipated to act as a catalyst to create heating opportunities for new or existing local businesses and amenities.

Veolia therefore proposes to review the situation and suggests that a further review report is prepared by end January 2016 in order to assess the potential for such a heat scheme and its timetable, once the facility is operational.

Addendum Note – Veolia UK district heating projects

### Sheffield

Veolia operates a successful District Heating scheme in Sheffield, where the successful district heating system can be characterised by a number of key points:

- high density housing and large energy consumers within 1 to 2 km of the source
- a number of different types of building to provide a steady heat demand throughout the day and throughout the year
- willingness of customers to sign long term supply contracts of 10 to 25 years

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- Partnership with local council to provide energy to council buildings
- commercial and financial decisions made with a view of the long term
- high quality customer service
- intensive planned preventative maintenance and replacement schemes

The district heating scheme in Sheffield began in 1988, with the connection of 15 tower blocks (14 storeys each). Following this a large council block of 995 flats was connected. This formed Network 1, which exported heat mainly to Council housing towards the south of the city centre. Network 2 was set up to feed areas to the north and west of the city centre and the centre itself. Work began on the installation of Network 2 in 1990. This network is the larger of the two and feeds a diverse range of buildings including sports centres, courts, hotels, both city university campuses, small commercial premises, museums, council and privately owned flats and a large number of council buildings. There are now 6 district heating zones within Sheffield and more details are available on the websites below.

<http://www.veoliaenvironmentalservices.co.uk/Sheffield/What-happens-to-your-waste/District-Energy/>  
[http://www.veoliaenvironmentalservices.co.uk/Documents/Publications/Sheffield/sheffheat\\_web/index.htm](http://www.veoliaenvironmentalservices.co.uk/Documents/Publications/Sheffield/sheffheat_web/index.htm)

### **SELCHP**

Working in partnership with the London Borough of Southwark, this district heating scheme is now operational and supplies 2,500 Southwark properties on a 5km pipe work system with heat and hot water. This assists in the council's fight against fuel poverty by making heat cheaper than gas and to provide low carbon heat, as the waste that SELCHP burn is about 60% renewable carbon.

<http://www.selchp.co.uk/news/district-heating-connection-to-selchp-turbine/>