STACK HEIGHT DETERMINATION

Stanmore Business Park, Bridgnorth

Prepared for: Circular Resources (UK)

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1.0 Stack Height Determination Evidence

SLR Consulting Ltd (SLR) has been commissioned by Circular Resources (UK) ('CRUK') to undertake a stack height determination assessment for a proposed small waste incineration process (SWIP) ('Proposed Installation') at Stanmore Business Park, Bridgnorth (the 'Site'). The Site lies within the administrative area of Shropshire Council (SC).

The Site is located at the approximate National Grid Reference (NGR): x374706, y292787 and is bounded by:

- mixed commercial and industrial premises to the north;
- industrial premises to the east, beyond which is Estate Road and agricultural land / woodland;
- Estate Road and commercial properties to the south, beyond which is agricultural land / woodland; and
- mixed commercial and industrial premises to the west, beyond which is Stanmore Country Park.

An Air Emissions Risk Assessment (AERA) was submitted to Shropshire Council (SC) as part of the Environmental Permit (EP) application for the Proposed Installation, representing two 15m flue gas exhaust stacks. Following submission, the Environmental Health Officer (EHO) at SC requested further evidence in relation to how the proposed stack height of 15m was determined. This note sets out the approach undertaken to inform the proposed stack height.

1.1 Stack Height Assessment Approach

Air quality modelling was undertaken to establish the associated air quality impacts and improvements to localised dispersion with incremental increases in stack heights above the building roof height (9.5m). This involved the use of the United States (US) Environmental Protection Agency (EPA) approved AERMOD model.

Five years of meteorological data (2016-2020) recorded at Shawbury meteorological station was obtained for the purposes of dispersion modelling. For the purposes of informing an initial stack height, 2017 meteorological data was used. This dataset was considered to be worst-case, following a review of modelled outputs across the five years of meteorological data applied as part of the AERA (2016-2020 Shawbury). Once the stack height was confirmed, the full suite of meteorological data was used as part of the AERA, where the average across all years was taken. This was to ensure all variances of local meteorological conditions are captured within the AERA to minimise uncertainty.

With the exception to the treatment of meteorological data, the technical approach to the stack height dispersion modelling assessment was consistent with the methods presented within the AERA, with incremental stack heights.

Assessment criteria in relation to both human and ecological receptors provided within the following guidance documents was used to establish a suitable stack height:

- Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM): Land-Use Planning and Development Control: Planning for Air Quality[1]; and
- Environment Agency: Air Emission Risk Assessment for your Environmental Permit[2].

A stack height of 15m for both flues resulted in the following modelled outcomes:

- effects at all assessed human receptor locations are considered to be not significant - in accordance with EPUK and IAQM guidance, given that:

[1] Environmental Protection UK and Institute of Air Quality Management, Land-Use Planning and Development Control: Planning for Air Quality, v1.2 2017.

[2] https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit

  - impacts in relation to long-term air quality standards at human receptor locations of relevant exposure are considered to be negligible; and
  - impacts in relation to short-term air quality standards at human receptor locations of relevant exposure are considered to be at worst slight.
- there are no predicted exceedances of air quality standards for the protection of human health at the point of maximum ground level impact for any of the scenarios assessed;
- predicted impacts upon the Bridgnorth Air Quality Management Area (AQMA) with respect to nitrogen dioxide (NO_2) concentrations are considered insignificant; and
- predicted impacts on designated sensitive habitats are considered insignificant.

Based upon the above outcomes, a minimum stack height of 15m for both flues was considered suitable as there would be limited material benefit with regards to reducing impacts on the environment with an increase in stack height beyond 15m.

The results of the dispersion modelling exercise relating to a stack height of 15m are provided in the AERA.

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