Swadlincote Energy Recovery Facility (SERF)

Greenhouse Gas Assessment

on behalf of R&P Clean Power Limited

Application for Environmental Permit

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Climate change risk assessment

This document sets the possible climate change hazards, impacts and associated mitigation measures for Swadlincote Energy Recovery Facility (SERF). The Environment Agency (EA) climate change adaptation guidance[1] has been used to prepare this document, alongside, the Climate impacts tool: guidance for Environment Agency staff, a high-level risk screening tool used to understand potential opportunities, risks and impacts from a changing climate[2].

The Swadlincote Energy Recovery Facility 'SERF' (the 'Facility') is located in South Derbyshire at Cadley Hill, approximately 2km west of Swadlincote, Derbyshire. The Facility is centred at National Grid Reference SK 268 190, with the nearest postcode at DE11 9EN. The Facility is inland, so therefore is not at risk of sea level rise, or tidal flooding. It is located within a Flood Zone 1 boundary.

1. Summer daily maximum temperature

The temperature may be around 7°C higher compared to average summer temperatures now, with the potential to reach extreme temperatures as high as over 40°C with increasing frequency based on today's values.

Impact 1:

Increased waste temperatures with potential for greater odour generation, overheating of odour control and/or ventilation systems failure leading to odour emission and pests from stored waste.

Mitigation:

System controls in place to monitor performance. To be checked and reviewed during periods of prolonged hot weather.

Operational controls to including waste cycling in the storage pit to minimise potential for odour generation, and waste inventory is minimised as far as possible during shutdown periods.

Impact 2:

Increased risk of overheating of waste storage and management leading to enhanced fire risk.

Mitigation:

The Facility will be fitted with a thermal imaging camera. If any "hot spots" are identified within the waste piles, these will be isolated and waste removed and dowsed externally, as per the procedures detailed within the Fire Prevention Plan.

During periods of extreme weather with very high temperatures, additional monitoring of the bunker by the thermal camera will occur.

Impact 3:

Increased risk of "hot loads" being introduced into the Facility, leading to enhanced fire risk.

Mitigation:

Identification of hot loads is part of the regular waste acceptance check, and there is a Fire Prevention Plan in place.

During periods of elevated temperature, staff will be alerted to the additional risk of hot load entry into the Facility and reminded of procedures for managing this risk.

Impact 4:

Increased ambient temperatures reduce the efficiency of the Air-Cooled Condensers (ACCs).

Mitigation:

Design of ACCs to consider potential ambient temperature increases. Impact is increased airflow with associated energy demand reducing the exported electricity.

[1] Combustion energy from waste: examples for your adapting to climate change risk assessment - GOV.UK (www.gov.uk)

[2] LIT16801-Climate-impacts-tool.pdf (publishing.service.gov.uk)

Impact 5:

An air quality assessment carried out highlighting negative impacts of climate change on human health including increased risk to staff health due to increase in dust emissions.

Mitigation:

Measures to mitigate dust emissions during the operational phase have been considered. A Dust Management Plan is in place for the Facility. Mitigation measures rely on water. Sufficient water will be applied to damp down the material to prevent dust emissions. There should not be any excess to potentially contaminate local watercourses.

2. Winter daily maximum temperature

This is 4°C more than the current average, however extremes of temperature could be experienced.

Impact 1:

Extremely cold temperatures could lead to pipes freezing and associated process disruption. However, risks are likely to be low due to most pipework being internal.

The main risk is likely to be freezing of condensate from air-cooled condensers, particularly under lower plant load. However, the likelihood of pipes freezing is reduced as winter daily temperatures increase.

Mitigation:

Regularly inspect and maintain insulation, particularly on pipework and equipment in exposed areas of the Facility.

3. Daily Extreme Rainfall

Daily extreme rainfall could increase by up to 20% on today's values (peak rainfall intensity).

Impact 1:

Exceedance of surface water drainage system can result in flash flooding issues. The capacity of surface water discharge points may become overwhelmed.

Mitigation:

The surface water drainage system will be designed to accommodate 1 in 100-year flood event + allowance for climate change.

Under normal operations the increase in rainfall intensity should not cause an exceedance within the Facility's drainage network. However, it is considered more likely to increase the risk of off-site drainage of surface water to be restricted, or a severity from a blockage in the drainage system. Manual checks of the discharge point will be needed in periods of extreme rainfall.

Impact 2:

Potential for contaminated floodwater or surface water run-off from the Facility, causing pollution.

Mitigation:

Maintain drainage systems, including interceptors and traps to avoid uncontrolled washout of pollutants.

4. Average Winter Rainfall

Average winter rainfall may increase by over 40% on today's averages.

Impact 1:

Increased risk of local groundwater flooding.

Mitigation:

The Facility is being raised to mitigate the risk of fluvial flooding as it is situated above an area of high-water table. The Facility is to be served by a new stormwater network which includes use of Sustainable Drainage Systems (SuDS). Therefore, the Facility is designed to be resilient to groundwater flooding and hydrostatic pressure.

If required a flood plan will be put in place, with reference to the guidance, including measures such as emergency pumps to remove flood water, and protection of electrical systems.

5. Drier Summers

Drier summers, potentially up to 40% less rain than now.

Impact 1:

Higher potential for dust emissions.

Mitigation:

Maintain dust management system within the building. During these events, short-term dust annoyance may occur, however, the scale of this would not normally be considered sufficient to change the conclusion that overall, the effects will be 'not significant'. A Dust Management Plan is in place for the Facility.

Impact 2:

Lower rainfall may lead to an increased risk of drought and water shortages. Energy from Waste (EfW) plants are not high-water users; however, this impact may cause a disruption to the operation of the Facility.

Mitigation:

Potential mitigations that could be implemented at the Facility include a water management plan, or the introduction of design efficiencies such as dual flush toilets. Water is already re-used within the process on-site.

6. River flow

The flow in UK watercourses could be 50% more than now at its peak, and 80% less than now at its lowest.

Impact 1:

At low flow there is likely to be increased stress on a river if the plant is discharging into it.

Mitigation:

Foul flows generated by the Facility will be treated on-site. The treated effluent will be discharged via the SuDS outfall route which connects to the downstream watercourse.

7. Storms

Storms could see a change in frequency and intensity. The unique combination of increased wind speeds, increased rainfall, and lightning during these events provides the potential for more extreme storm impacts.

Impact 1:

Storms and high winds could damage building structures with increased potential for fugitive odour emissions.

Mitigation:

Maintain building integrity, review wind loading calculations and provide reinforcement if necessary.