Non-technical Summary – DP3107LF

Colt – Powergate Data Centre

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CONTENTS

Page No.

1.0 INTRODUCTION

HDR Consulting Limited (HDR) has been appointed by Colt Data Centre Services Limited (Colt) to prepare and apply for a new bespoke Environmental Permit (ref DP3107LF) for the "Colt – Powergate" Data Centre installation located at:

Unit 9-13

Volt Avenue

Powergate Business Park

North Acton

NW10 6PN

Grid reference: TQ 20971 82811

1.1 Purpose of this document

Colt as the legal operator is required to apply to the Environment Agency (EA) for a Schedule 1, Part A(1) (a) Environmental Permit because the total thermal input capacity of the site's combustion plant will exceed the 50MWth threshold stipulated by the legislation[1].

This document provides a non-technical summary of the installation and the application for a permit.

[1] The Environmental Permitting (England and Wales) Regulations 2016 (as amended)

2.0 SITE SUMMARY

2.1 Site operations

Colt - Powergate, has been operating as a Data Centre since 2001 and as with other Data Centres it utilises Emergency Standby Generators (ESGs) to provide emergency power in the event of grid electrical failure.

Data Centres are an essential part of national infrastructure, underpinning a large portion of the UK's economy. Essentially, Data Centres enable a wide range of digital activities including hosting various internet-based activities via servers in large "data halls" or warehouses.

Data Centres such as Colt - Powergate, rely on an uninterruptible supply of electricity to power the various servers and associated IT equipment. An interruption or break in this supply even momentarily would have catastrophic consequences on equipment and on the operator's reputation. As such, Colt – Powergate employ ESGs to provide power should the grid supply to the site fail.

Grid supplies are very reliable, however, in the unlikely event of an outage, the generators are designed to operate until the grid supply is restored. Outages are highly rare events and thus operation is normally limited to testing and maintenance. See 'Section 3.4.4' for more information on grid reliability.

2.2 Surrounding area

The site is located within Powergate Business Park, an industrial estate in North Acton (See Figure 2.1 & Figure 2.1). There is a train line to the East and the Grand Union Canal runs from North to East, with the A40 to the South. There are residences to the West (approx. 350 m), North (approx. 500m), Northeast (approx. 500m) and Southeast (approx. 600m).

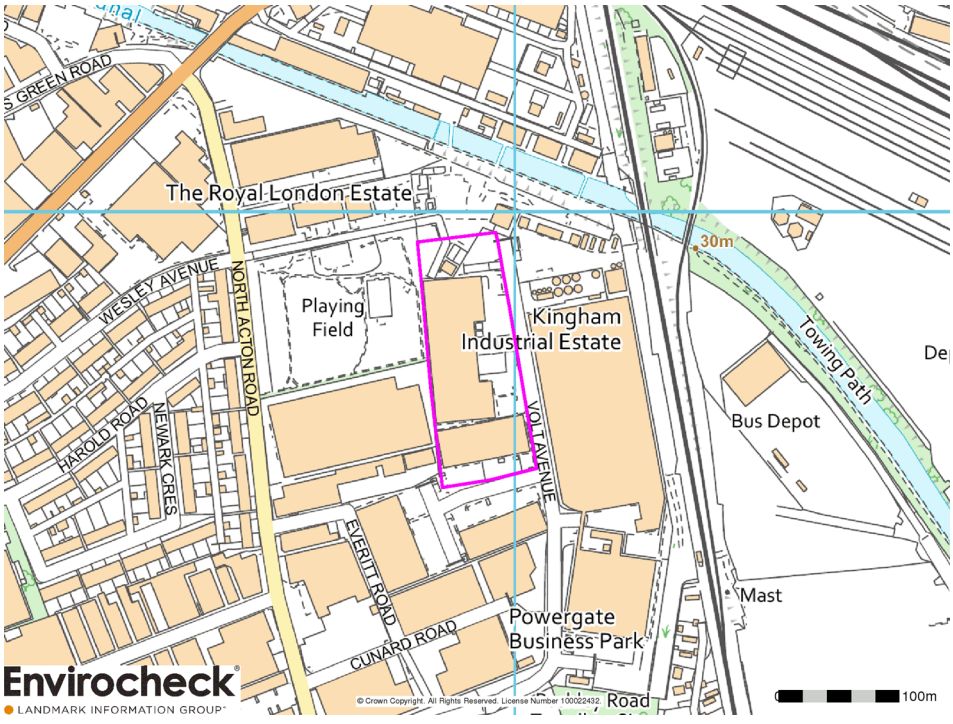

Figure 2.1 Site location

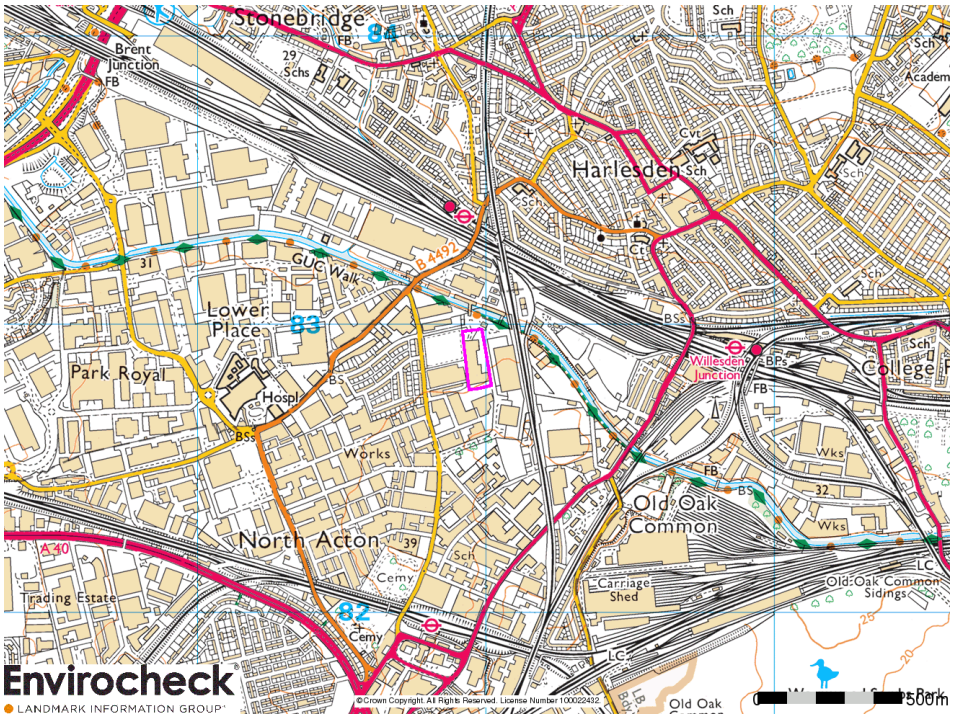

Figure 2.2 Site neighbourhood

2.3 Combustion plant and expansion plans

Expansion works in 2022 will see 6no. additional ESGs installed and commissioned which will result in the total thermal capacity exceeding 50MWth for the first time in the sites history.

All of the ESGs due to be commissioned are over 1MWth and are classed as 'Medium Combustion Plant' (MCP). Details of the existing and new MCPs are in**Error! Reference source not found.** below with more details in Figure 2.3 and in the thermal schedule provided with the application.

Table 2.1: Summary of MCP details

MCP type	No. of ESGs	Thermal capacity	Install date
Existing	7	~30MWth	Pre 2010
New	6	~32MWth	2023
Total after expansion	13*	~62MWth	

*As part of the expansion works, 4no. existing ESGs have been decommissioned and replaced with 2no. new temporary ESGs. These temporary ESGs will be removed once the 6no. new ESGs have been commissioned and therefore have not been included in the application.

The ESGs are "excluded MCPs" as they are purely standby plant and there is no capacity agreement in place. Operation of the ESGs is likely to be limited to monthly/annual maintenance and testing of approximately 13 hours/year/generator.

The ESGs are capable of operating on diesel or biodiesel such as 'HVO' or Hydrogenated Vegetable Oil.

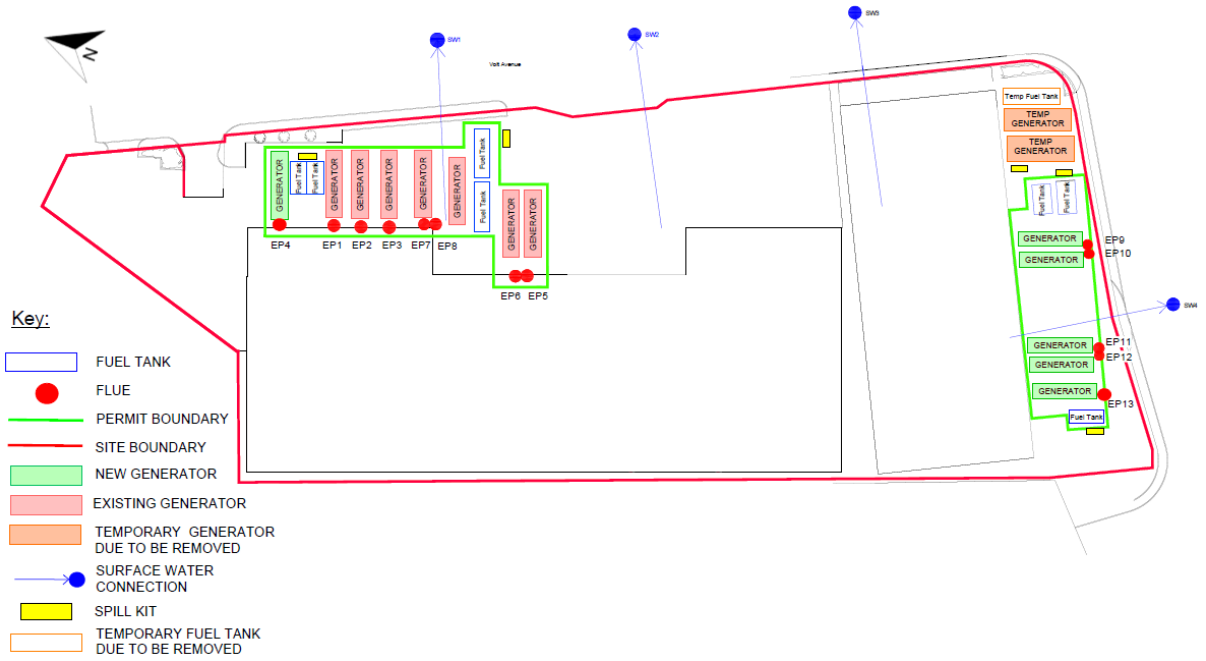

Figure 2.3 - Installation boundary and emission points

2.4 Commissioning of new generators

Commissioning of the 6no. new ESGs is required to test that it will be fit for purpose and that systems are functioning properly prior to using the data halls. Only 5 of the 6 new ESGs are to be commissioned in approx. Q1 of 2023, pending EA approval. The current commissioning plans presented in the table below

Table 3.1: Commissioning plan

Level	Purpose	Est Run hours / generator
3	Generator & Fuel System	Exact times are unknown, estimated as approx. 8-10 hours per generator over the course of several weekdays
4	Functional Performance / Site Acceptance Test	Exact times are unknown, estimated as 4-6 hours per day over the course of several weekdays. Worst case would be approx. 18 hours per generator total.
5	Integrated System Test (IST)	Exact times are unknown. Worst case is approx. 4 hours a day over 2 days totalling approx. 8 hours per generator

2.5 Site history

Historical land use maps show the site remained free of development until 1957, when several buildings were constructed for 'Works'. The site remained unchanged between 1966-67. By 1975-76, a Power Station with cooling towers had been constructed. The land use remained unchanged until 1996 when the Power Station and some works were removed. The site was redeveloped into its current footprint from 2000 onwards.

2.6 Existing permits

From 2013 to 2021 the site held a Greenhouse Gas permit (GHG) to comply with the EU emissions trading system (EUETS). In 2021 this was revoked following Brexit and new rules under the UK ETS. Compliance with this permit required Colt to record fuel consumption and generator run hours monthly. From this raw data, annual CO_2 emissions were calculated and reported to the EA. This data has been independently verified and can be provided to the EA upon request. Monitoring of this data is an ongoing requirement for the site team.

3.0 ENVIRONMENTAL PERMIT APPLICATION

3.1 Permit type

The activities onsite require a bespoke installation permit under Schedule 1, Part A(1) (a) of the Environmental Permitting Regulations: *"burning of any fuel in an appliance with a rated thermal input of 50 megawatts or more."*

The regulated activity relates to the operation of 7 no. existing ESGs and 6 no. new ESGs, with a total site capacity of approx. 62 MWth (see Thermal Schedule & Emissions Points, submitted alongside this application).

All of the new ESGs are over 1MWth and are classed as new Medium Combustion Plant (MCP). The existing ESGs are classed as existing MCPs.

3.2 Directly associated activities

The Directly Associated Activities (DAA) include the fuel storage tanks, pipework and the drainage network which are discussed in the following sections.

3.3 Application contents

This application has been prepared in accordance with the EA's informal BAT guidance document: 'Data Centre FAQ Headline Approach v11' (May 2020).

The following documents have been submitted to the EA as part of the application for a permit. We have provided a high level non-technical summary of each of these in the following sections. Please refer to these documents for further information.

- Non-technical Summary (this document)
- Application forms – A, B2, B3 & F1
- BAT Assessment
- Site Condition Report
- Environmental Risk Assessment
- Air Quality Dispersion Modelling Assessment (AQDMA)
- Noise Impact Assessment
- Draft Air quality Management Plan
- Supporting information including site plans, drawings, generator datasheets etc

3.4 BAT assessment

A BAT assessment has been submitted with the application. This has been structured using the EAs informal BAT guidance document; '*Data Centre FAQ Headline Approach v11'* (May 2020). The assessment report seeks to provide evidence of BAT or justification where the requirements have not been met.

The following sections provide a non-technical summary of the BAT assessment which concluded that the installation is considered to meet the above BAT requirements.

3.4.1 Technology selected to provide emergency power

ESGs have been selected to provide emergency power to the installation in the event of grid failure on account of the following:

- Proven as a reliable technology
- Cold start capability
- Space requirements
- Fuel suitability
- Lifetime of stored fuel

3.4.2 Generator Operation

The ESGs are solely used as standby plant for emergency power provision in the event of grid failure. There is no capacity agreement in place or plans to operate the generators for generating revenue. As such, operation of the generators is likely to be limited to monthly maintenance and testing of no more than 50 hours / year / generator. The current monthly testing regime has the existing ESGs running for 13 hours per annum.

Planned operation of both existing and new ESGs for testing and maintenance is expected to be the same, however, operation during a grid outage may vary due to differing electrical arrangement.

Testing and maintenance

The current monthly test regime will have ESGs tested on separate weeks, depending on what data hall they serve. The test will run for 1 hour at the generator's current load. The current load of the ESGs varies depending on the individual unit.

In addition to monthly tests, each ESG will be tested separately, beginning at 10am on a Saturday in December, at current load for 1 hour, once per annum.

This equates to 13 hours per ESG, per annum.

Grid outage

In the unlikely event of a loss of grid power to the building, the ESGs will operate to support the site load. The arrangement for a single side outage and a micro power outage at this installation vary depending on what data hall the ESGs support.

The fuel requirements are based on a worst-case scenario where the data halls are at capacity requiring the generators to run at 100% load. In reality, halls are unlikely to reach their design capacity. The current design is as follows:

- Existing generators (ISC &FDC) – 72 hours
- New Generators (IDC5-7) – 48 hours

For more information on ESG operation during an outage please refer to the 'BAT Assessment' submitted with the application.

3.4.3 Generator emissions performance

The engine datasheets for the existing and new ESGs have been supplied with the application.

The 6no. new ESGs that have been selected to support the site expansion are emissions optimised and achieve the TA-Luft 2g' (2,000mg/Nm^3 @ 5%O2 @100% load) as well as the Tier II US EPA standard.

The 7no. existing generators are legacy sets which were commissioned in 2001.

Further information on generator emission performance can be found in the AQDMA (See Section **Error! Reference source not found.**) and the 'BAT Assessment' submitted with this application.

3.4.4 Generator electrical supply

The substation powering the installation has two feeds (A & B). Each feed can support the full site load, meaning that if one feed was to fail, electrical provision to the installation would not be compromised. Grid electrical supplies are highly reliable and have potential to meet 99.99995% reliability, equating to 32 seconds of downtime per year (BAT Assessment – Appendix C). No outages from the grid supply have been reported to date in 2022.

3.4.5 Generator flue design

Each generator set has a dedicated flue / 'stack' (see Figure 3.1 and Figure 3.2 below). Existing flues have an elevation of approx. 10.5m, while the new ESGs will have flues with an elevation of approx.13.63m.

Figure 3.1 - Existing generator flues

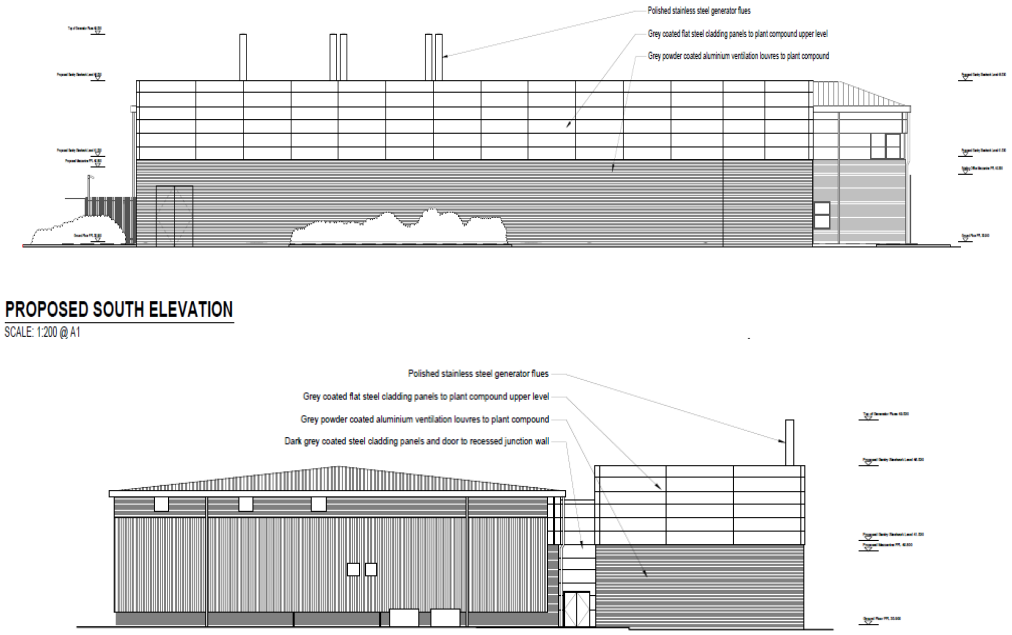

Figure 3.2 - Flues for new build generators

3.4.6 Fuel tanks

The 7no. existing ESGs are supplied directly by 4no. bulk tanks which are adjacent to the ESGs. The 6no. new ESGs will be served by 5no. day tanks, which are fed from 3no. bulk tanks, also located adjacent to the generators.

In addition, the 2no. temporary ESGs are served by a single tank. These tanks and the ESGs will be decommissioned and removed once the new ESGs have been fully commissioned and handed over.

3.4.7 Drainage

The site is largely covered in good quality hard standing. The drainage system is split into separate foul and surface water networks (see drainage plans submitted with the application). Site drainage exits into the drainage network for the entire industrial estate. Thames Water are the sewerage provider and CBRE oversee the network for the estate.

Discharges to surface water drains are expected to be limited to surface run-off which is unlikely to contain significant levels of contaminated liquid e.g., fuel / oils. Drain covers are to be used during refuelling exercises and multiple stocked spill kits are located close to fuel tanks around the site.

The surface water drainage system is connected to a forecourt separator located near the new generators. Surface drainage from this area is directed pass through the separator prior to discharging to the local network. An automatic sensor will detect the presence of fuel and close when actuated.

3.4.8 Management Standards

The following management standards are currently held by Colt for Powergate:

ISO/IEC 27001:2013 – specifies the requirements for establishing, implementing, maintaining, and continually improving an information security management system within the context of the organisation. It also includes requirements for the assessment and treatment of information security risks tailored to the needs of the organisation. The requirements set out in ISO/IEC 27001:2013 are generic and are intended to be applicable to all organisations, regardless of type, size or nature.

ISO9001:2015 – specifies the requirements for establishing, implementing, monitoring, managing, and improving quality throughout the organisation.

3.4.9 Environmental management system

Colt has implemented an effective Environmental Management System (EMS) that is accredited to the internationally recognised ISO 14001:2015 standard. The EMS places specific focus on the following:

- Reducing risks to the environment to a level that is as low as reasonably practicable using best available techniques
- Integrating EMS responsibilities within line management
- A commitment to personnel environmental awareness and competence
- The ongoing monitoring and review of environmental performance
- A commitment to working to achieve continuous improvement in environmental performance.

Integral to the EMS will be an overarching environmental policy. This seeks to underpin the EMS and help uptake by each staff with sufficient training provided as required.

3.4.10 Air Quality Management Plan

A draft Air Quality Management Plan or ‘AQMP’ has been provided with the application which describes the risk to local air quality in the event of prolonged generator operation in response to a grid outage. The aim of this is to minimise impacts on local air quality and describes the actions to be taken to help reduce impacts and notify sensitive receptors and the EA (as required). This will be finalised and incorporated into the site’s operating procedures once the new plant is commissioned.

3.5 Operational procedures

Colt has several Standard Operating Procedures (SOPs) that are pertinent to the application for an environmental permit. These include:

- Spill response procedure
- Refuelling procedure
- Grid failure procedure (Air Quality Management Plan or 'AQMP')

3.6 Site condition report

Colt - Powergate has been operating as a Data Centre since 2001. The site has been used for Works and a Power Station since its first development in 1957, until it was redeveloped into its current footprint from 2000.

Soil and groundwater sampling and laboratory analysis has been completed as part of the recent development works. This provides a record of baseline conditions prior to permit issue. The results of this have been presented in the Site Condition Report which has been prepared in accordance with the EA's H5 Guidance Note 2 with details on the following:

- Site background
- Condition of the land at permit issue
- Geology
- Hydrogeology
- Hydrology
- Previous land use
- Pollution history
- Evidence of historical contamination
- Permitted activities

3.7 Environmental risk assessment

An Environmental Risk Assessment (ERA) has been provided in support of this application using the EA's "Risk assessment for your environmental permit" guidance.

The purpose of the ERA is to identify the potentially significant risks to human health and the environment from permitted activities, as well as the controls in place to help mitigate these risks to an acceptable level.

The potential risks identified as part of the ERA are outlined below:

- Controlled releases to air
- Accidents
- Odour
- Noise and Vibration
- Fugitive emissions (from uncontrolled sources)
- Visible emissions
- Global warming potential
- Waste
- Water discharges

[2] https://www.gov.uk/government/publications/environmental-permitting-h5-site-condition-report.

3.8 Air quality dispersion modelling assessment

The ERA identified that there is potential for local Air Quality to be impacted from the operation of the ESGs. A detailed AQDMA has been undertaken focussing on NO_x emissions, given the installation is located within a designated Air Quality Management Area (AQMA) for NO_2. The AQMA also considers PM_{10} as a pollutant of concern within Ealing. Additional pollutants considered in the AQDMA included PM, SO_X and CO.

The AQDMA reviewed the long and short-term impacts on local air quality from the operation of the generators under the following scenarios:

- **Scenario 1**: 'Testing and maintenance' – this accounts for 13 hours of operation per year, per generator at site load (assumed 50%) and tested individually.
- **Scenario 2**: 'Emergency power outage' – this accounts for a 72-hour grid failure event, with all 13 generators running concurrently at site load (assumed 50%).

The AQDMA predicted that the impact of the standby generators during Scenarios 1 & 2 would be '**not significant**' for both short- and long-term impacts, with the exception of 1-hour NO_2 concentrations associated with Scenario 1. The 1-hour NO_2 concentration in Scenario 1 would be exceeded at 4 human receptors. These receptors are buildings within the industrial estate.

The AQDMA also predicted the impacts at ecological sensitive receptors for annual mean NO_x concentrations and annual mean nitrogen and acid deposition rates. Impacts were considered to be '**not significant**', with the exception of the 24-hour mean NO_x concentration associated with Scenario 1.

The report highlighted that the results from Scenario 1 are overestimations and where the model has generators running concurrently at 100% load for testing purposes, it is likely that during testing and maintenance, the generators should be operated individually and at site load (assumed 50% as a worst case). It is therefore unlikely that these exceedances will occur given the conservative nature of the assessment.

The results for Scenario 2 are not regarded to be representative of typical site operations and therefore should not be used to determine significance of impacts of the Data Centre.

As per Section 3.4.10, a draft AQMP has been prepared with the application to help mitigate impacts during an outage (Scenario 2).

3.9 Noise assessment

The ERA identified that noise from the site's generators might impact nearby receptors. To investigate this potential risk, a Noise Impact Assessment was conducted.

The assessment concluded that "*noise levels are predicted to achieve the noise limits at the nearest noise sensitive properties and therefore noise impacts are not considered to be significant.".* Further information can be seen in the 'Noise Impact Assessment' submitted with this application.

3.10 Climate change risk assessment

A Climate Change Risk Assessment (CCRA) has not been completed in support of this application. A total screening score of 4 was recorded within Section 6b of application form Part B2. A screening score of 5 or more requires a CCRA to be completed. However, risks associated with climate change have been considered within the design and operation of this Data Centre and are discussed within the 'BAT Assessment'.