



Non-Technical Summary

Longcross Data Centre: SP3004SB

Date: April 2024

Issue: 1

Reference: 10274458

Status: Issue

Issuing office: Glasgow

DOCUMENT CONTROL

Issue	Date	Status	HDR Author	HDR Approval	Notes
1	18/04/2024	Issue	12/04/2024_MM	18/04/2024_NS	First issue

Copyright and Non-Disclosure Notice

© Copyright HDR Consulting Limited 2024

HDR Consulting Limited (HDR) have prepared this report in accordance with the instructions from our client and within the scope agreed. This report may not be copied or used without our prior written agreement for any purpose other than which it was intended.

In preparing the report we have exercised all reasonable skill, care and diligence considering the scope of the work agreed, the timescales and information made available at the time of writing.

HDR grant an irrevocable, non-exclusive licence to use this report for the purpose for which it was originally produced. HDR shall not be responsible (to any party) for the use of the documents for any purpose other than that for which they were originally prepared. The Copyright, design rights and any other intellectual rights shall remain the exclusive property of HDR and/or other data providers

CONTENTS

Page No.

- 1.0 INTRODUCTION4**
- 2.0 SITE SUMMARY5**
 - 2.1 Site Setting and Context.....6
 - 2.2 Site History7
- 3.0 ENVIRONMENTAL PERMIT APPLICATION8**
 - 3.1 Permit Type and Regulated Activities8
 - 3.2 Application contents8
 - 3.3 Site Condition Report8
 - 3.4 Environmental Risk Assessment.....9
 - 3.4.1 Air Quality Assessment.....9
 - 3.4.2 Noise Assessment9
 - 3.5 BAT Assessment.....10
 - 3.5.1 Technology selected to provide emergency power.....10
 - 3.5.2 Generator Operation10
 - 3.5.3 Generator emissions performance.....11
 - 3.5.4 Generator flue design11
 - 3.5.5 Grid electrical supply.....11
 - 3.5.6 Fuel storage11
 - 3.5.7 Drainage11
 - 3.5.8 Waste12
 - 3.5.9 Operating procedures12
 - 3.5.10 Management systems12
- 4.0 CONCLUSION13**

1.0 INTRODUCTION

This Non-Technical Summary (NTS) has been prepared by HDR Consulting Limited (HDR) on behalf of the operator Ark Data Centres Limited (Ark) in support of the application for a new bespoke Environmental Permit (ref SP004SB) for the “Longcross Data Centre” to be located at

**Longcross Data Centre,
Chobham Lane,
Longcross,
Chertsey,
KT16 0EE
Grid reference: SU 97896 65526**

Ark as the legal operator is required to apply to the Environment Agency (EA) for an Environmental Permit because the total thermal input capacity of the site’s combustion plant exceeds the 50 MWth threshold stipulated in the legislation¹.

Ark currently holds several other Environmental Permits for other operational Data Centres with permit reference numbers as follows: JP3300SN, PP3003PW and VP3235DJ. Ark is fully committed to operating in accordance with the relevant permit conditions and demonstrating best practice within the Data Centre sector.

This document provides a non-technical summary of the installation and the application for a permit, including the supporting information submitted along with the application.

¹ [The Environmental Permitting \(England and Wales\) Regulations 2016 \(As Amended\)](#)

2.0 SITE SUMMARY

The Longcross Data Centre is currently being constructed with completion and handover expected in early 2025. The data centre will house various IT equipment that will require a constant stable electrical supply to operate effectively.

The site, when operational will use Emergency Standby Generators (ESGs) to provide emergency power in the event of the grid supply being unavailable. Ark have selected the 3.2MWe Rolls Royce MTU DS4000 generator set for this application. Each ESG has a thermal capacity of 8.01MWth and in total, the current plans are for x28 no ESGs to be installed when at full capacity. This gives a total capacity of approx. 224MWth.

The x28 ESGs will be installed over two floors and several phases, with x14 being installed in Phase 1 and the remaining x14 in Phase 2. The location of the ESGs can be seen in Figure 1 and Figure 2 below. The installation boundary encompasses the listed activities only and is outlined in green on Figure 1 below.

The ESGs are 'limited hours MCPs' as they are purely standby plant operating for maintenance and testing and in emergencies. There is no capacity agreement in place. The ESGs are capable of operating on diesel or biodiesel such as 'HVO' or Hydrogenated Vegetable Oil.

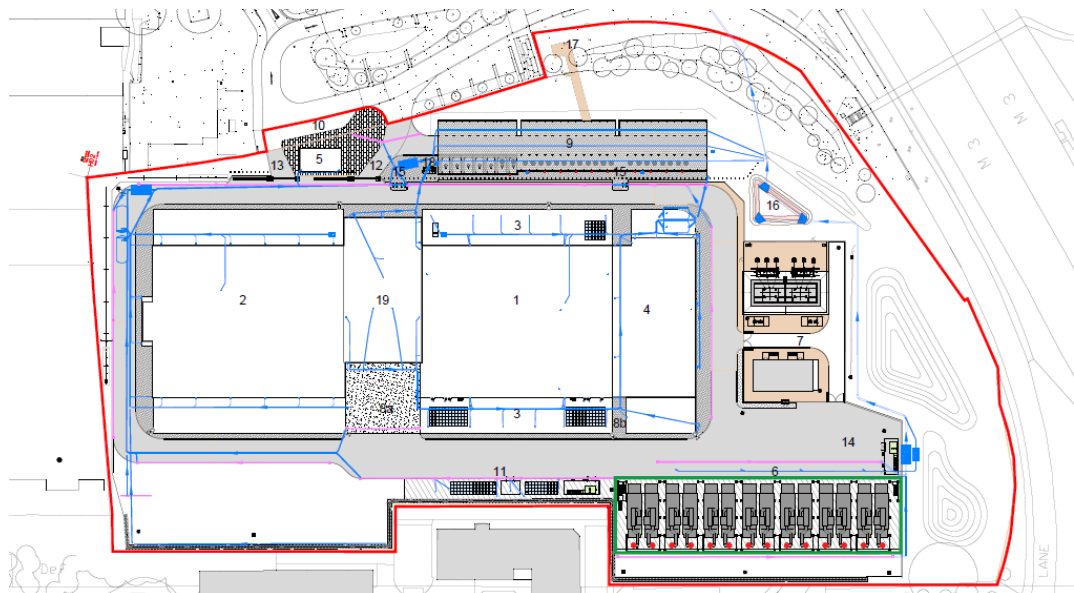


Figure 1: Site Plan showing permit boundary and emissions points

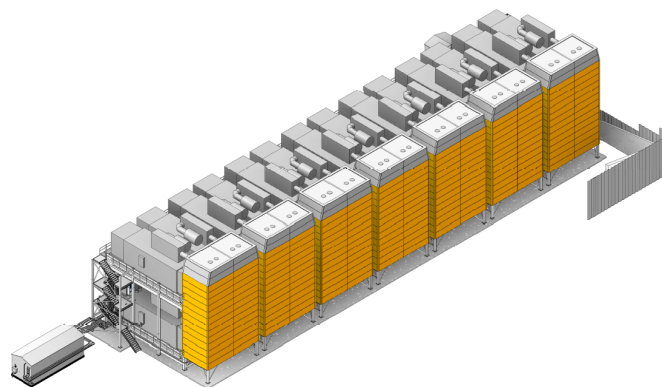


Figure 2: Indicative Generator layout

Data Centres are an essential part of national infrastructure, underpinning a large portion of the UK's economy. 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 rely on an uninterrupted supply of electricity to power various 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, Data Centres, employ standby backup generators to provide power should the grid supply be unavailable.

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 rare events and thus operation is normally limited to testing and maintenance, which is likely to be less than 63 hours or 0.007% of a year for all 28 ESGs (of these 63 hours only 7 will be concurrent running, the remainder will be a pair of generators (2) at a time).

2.1 Site Setting and Context

The site boundary can be seen in Figure 3 and Figure 4 below. The site is approximately 6km to the west of Chertsey, located to the north of the M3 motorway, south of the Reading to London Waterloo railway line, and to the east of Chobham Common. The Site lies wholly within Runnymede Borough and borders Surrey Heath Borough to the West.

The site is in a rural location; the area is an industrial estate predominantly made up of hardstanding and numerous buildings of varying style and height. A motorway and woodland make up the southern and western perimeter. There is also a newly built residential development in the surrounding area. Beyond the direct site boundaries, to the South and West (approx. 300m), is an area of heathland (Chobham Common). Longcross train station is approximately 500m north of the site.

Further details can be found in the Environmental Risk Assessment (ERA) submitted with the application for a permit.

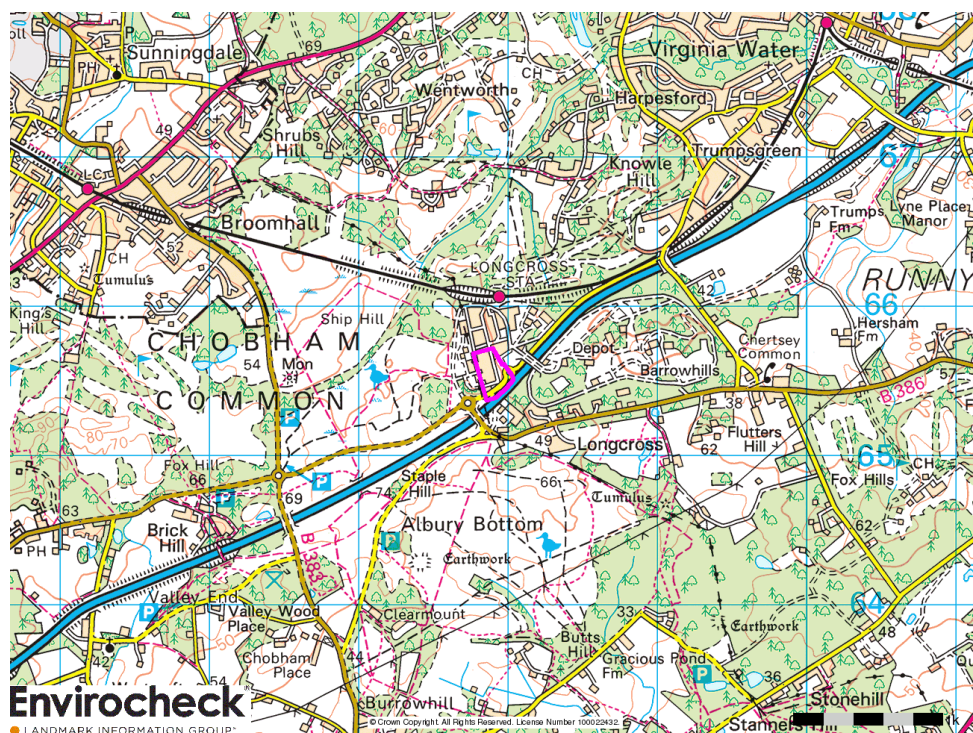


Figure 3: Site Location (1)

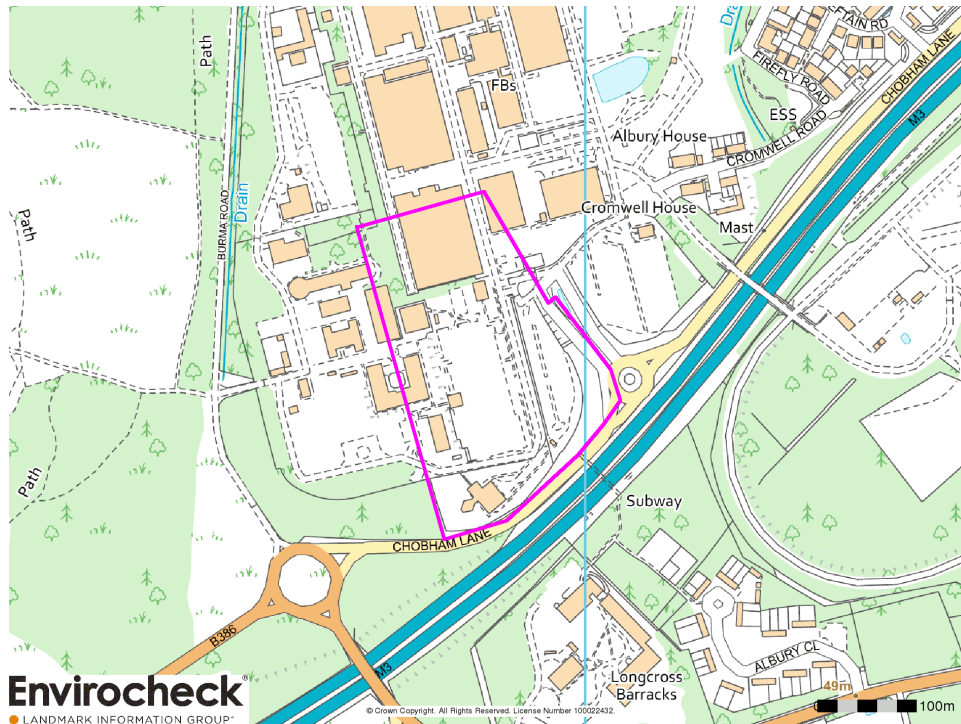


Figure 4: Site Location (2)

2.2 Site History

The current nature and layout of the site stems from its use as a military research and equipment testing facility from the 1940s until 2003. No longer in military use, the 41-hectare site is now used for commercial purposes with Longcross Studios temporarily using the site as a television and film studio. Further details can be found in the Site Condition Report submitted with the application for a permit.

3.0 ENVIRONMENTAL PERMIT APPLICATION

3.1 Permit Type and Regulated Activities

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 28no. ESGs with a total site capacity of approx. 224 MWth. These are classed as MCPs, but as they intend to be operational for less than 500 hours per year as a 5-year rolling average (due to being a standby supply), they are exempt from meeting MCP Emission Limit Values (ELVs).

The Directly Associated Activities (DAA) include the fuel storage tanks, associated pipework and the surface water drainage network.

3.2 Application contents

This application has been prepared in accordance with the EA’s informal BAT guidance document: *‘Data Centre FAQ Headline Approach v21’* (November 2022).

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 the latest version of these documents for further information.

- Non-technical Summary (this document)
- Application forms – A, B2, B3 & F1
- Site Condition Report (SCR)
- Environmental Risk Assessment (ERA)
 - Air Quality Assessment (AQA)
 - Noise Impact Assessment (NIA)
- Best Available Techniques Assessment (BAT)
- Thermal Schedule
- Supporting information including site plans, drawings, generator datasheets etc

3.3 Site Condition Report

A Site Condition Report (SCR) (or ‘Site Baseline Report’) has been submitted along with the application for a permit. Extensive baseline soil and groundwater sampling and site investigations were completed as part of planning requirements for the development of the site. These identified the presence of some degree of contamination from historical land use. A risk assessment and remediation strategy were undertaken, and subsequent sampling has since shown this to be effective with all planning conditions discharged.

This SCR is intended to provide the EA with a description of the baseline conditions at permit issue. The Site Condition Report which has been prepared in accordance with the EA’s H5 Guidance Note² provides 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

² [Environmental permitting: H5 Site condition report - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/environmental-permitting-h5-site-condition-report)

3.4 Environmental Risk Assessment

An ERA has been provided in support of this application using the EA's "Risk assessment for your environmental permit" guidance³.

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

Detailed standalone risk assessments have been completed to assess the risk of air quality and noise impacts from the operation of the ESGs. These are summarised below.

3.4.1 Air Quality Assessment

The ERA identified that Air Quality may be impacted from the operation of the generators. To investigate this potential risk, an Air Emissions Risk Assessment (AERA) has been undertaken. The focus of this assessment was on NO_x emissions as this is the primary pollutant of concern for combustion engines. Additional pollutants considered in the AERA included PM, SO_x and CO.

The site is not located within a designated Air Quality Management Area (AQMA) for NO₂.

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

- **Scenario 1:** Maintenance and Testing
 - Monthly - All generators will be tested monthly for 15 minutes
 - Quarterly - All generators will be tested quarterly for 1 hour; and
 - Annually - Each generator will be tested singly for 2 hours at maximum load capacity.

As there are 28 generators, this amounts to a total of 63 hours of testing per year (out of the 63 hours there are only 7 hours of concurrent SBG running in any one year period and it will not be 7 hours of continuous running).

- **Scenario 2:** Emergency outage scenario

In line with EA guidance and to assess worst case impacts, it has been assumed that the generators will operate 72 hours of continuous, concurrent running at 100% load out of a year for power failure purposes. This is a conservative estimate as during an outage it is likely there will be 24 generators running at less than 80% load at any one time leaving 4 generators available for use to cover any generator failures.

The AERA concluded "*the overall effect on human health is considered 'not significant'*".

The AERA has identified potential risks to ecological receptors adjacent to the application site. This is being further assessed by an ecologist and an addendum to the AERA is to be submitted during EA determination.

Once operational the site will seek to develop and implement an Air Quality Management Plan or 'AQMP' to mitigate air quality impacts during prolonged grid failure.

³[Risk assessments for your environmental permit - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit)

3.4.2 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 (NIA) was completed. This report concluded that *"the predicted noise levels indicate compliance with the adopted criteria"*. The accompanying technical note also identifies that the various forms of mitigation mean compliance with the adopted criteria can be achieved which is not exceeding the existing background noise climate at the nearest residential properties.

A bespoke generator acoustic canopy, for every generator pair, has been designed to reduce acoustic sound pressure to 75 dBA at 1m from the exterior of the unit at 1.5m above ground level.

Significant noise breakout is not expected as the ESGs operate infrequently as they are emergency standby plant designed to provide power in the event of an electricity supply failure. This is a highly rare event given electricity supply reliability. As such, annual operation is likely to be limited to testing and maintenance.

3.5 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 v21'* (November 2022). 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.

3.5.1 Technology selected to provide emergency power

ESGs operating on Diesel/HVO 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

3.5.2 Generator Operation

The ESGs are solely used as standby plant for emergency power provision in the event of the grid supply being unavailable. 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. Therefore, the generators are classed as 'limited hour MCPs' and are therefore exempt from meeting the BAT emissions limit values (ELVs) for new MCPs / specified generators.

The intended operation of the ESGs is as follows. This reflects the air quality modelling which accompanies the application for a permit.

Table 3-1 Summary of generator test regime

Frequency	Duration	Scheduling	Approx. Electrical load	Grouping	Total hours per generator
Monthly	15 minutes per gen	Weekdays	Offload i.e 0% Load	2 generators at a time	1
Quarterly	1 hour per gen	Weekdays	80% load	2 generators at a time	4
Annually	2 hours per gen	Weekdays	100% load	Each generator will be run separately	2

In the unlikely event of a loss of grid power to the building, all 28 generators (at full deployment) will start and then drop off according to requirement. The arrangement at this installation ensures that 24 generators can provide the full electrical requirement to the site, with 4 generators (2 on each level) as back up in the event a generator fails to start.

3.5.3 Generator emissions performance

The engine and emissions datasheets for the ESGs have been supplied with the application. The ESGs that have been selected to support the site expansion are emissions optimised and achieve the Tier II US EPA standard with NO_x emissions of 2,172mg/Nm³ @ 5%O₂ @75% load).

For the size and output, the engines selected are best in class for NO_x emissions.

It should be noted the proposed ESGs are each 4MVA emissions optimised generator sets, achieving NO_x emissions of 2,172mg/m³N at 75% load at 5% O₂, which is as close as to the 2000mg/m³N recommended in the EA Draft FAQ as is possible with generators of this size. Smaller generators 2.5 – 3MVA in size could have been chosen for this site, but the cumulative air quality impact of 38no. 3MVA sets @ 2000mg/m³N would be significantly greater than the proposed installation of 28nr 4 MVA generators with the above emissions.

Further information on generator emission performance can be found in the AERA and BAT Assessment documentation.

3.5.4 Generator flue design

The generators are set up in units of two, with an adjoining flue stack to dissipate the emissions from each unit. These stacks are not impeded by flaps or cowls, and the exhaust will exit vertically, approximately 20m above the ground.

Monitoring ports are to be pre installed on the generator flues to facilitate NO_x and CO monitoring in accordance with web guide 'Monitoring stack emissions: low risk MCPs and specified generators' Published 16 February 2021 (formerly known as TGN M5)⁴.

3.5.5 Grid electrical supply

Under normal circumstances electricity to the site will be provided by the Independent Network Operator (IDNO) UK Power Distribution (UKPD). The electrical infrastructure is such that there are multiple supply routes or 'feeds'. 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.

A site wide failure is considered extremely rare as it would require a catastrophic regional failure on the grid, or at the supplying power station, and would likely impact not only the site but the surrounding London area. As a result, the grid connection is considered to be highly reliable as demonstrated in the grid reliability letter provided with the application (calculated as 99.999605%).

3.5.6 Fuel storage

The generators will run on diesel although they can also run on HVO. Each of the 28 generators will have its own 66,290 litre usable (73,717 litre brim-full) tank which sits below the generator itself. The total onsite capacity when tanks are at 100% will be 1,856,120 litres. These "belly tanks" will be connected via pipes directly to the emergency generators.

The tanks will be integrally banded to 110% of the inner tanks capacity and made of a steel which conforms to BS799 standards. Tanks will be fitted with over fill alarms and leak detection. More details can be found in the BAT Assessment.

3.5.7 Drainage

The site is to be covered in good quality hard standing and the drainage system is split into separate foul and surface water networks.

⁴ <https://www.gov.uk/government/publications/monitoring-stack-emissions-low-risk-mcps-and-specified-generators/monitoring-stack-emissions-low-risk-mcps-and-specified-generators>

The permitted activities will not generate large volumes of trade effluent that would require EA consent to discharge. Discharges are likely to be limited to surface run-off which is unlikely to contain significant levels of contaminated liquid e.g. fuel / oils.

The surface water drainage system from the Installation is connected to a forecourt separator / interceptor prior to discharging to the local network. This will be fitted with an automatic sensor for detecting the presence of fuel and will close when actuated.

3.5.8 Waste

Small quantities of wastes may be generated from routine generator maintenance activities or in the event of a spillage/leakage. This is likely to be low given the standby nature of the generators and procedures utilised by Ark on other permitted sites will be in place to reduce the risk of spills and leaks spillage/leaks.

Procedures for licenced and responsible collection of waste oils and other hazardous wastes are to be developed once operational. These will be based on existing procedures in place at other Ark permitted sites and will be in line with Arks companywide Environmental Management system which is certified to ISO 14001. In accordance with this, waste generated is to be managed in line with the waste hierarchy, using licenced waste management providers and relevant Duty of Care information retained.

3.5.9 Operating procedures

Once the site is operational, suitable procedures utilised by Ark on other permitted sites will be reviewed, amended and implemented to capture any site specific aspects. Relevant and responsible staff are to receive appropriate training and awareness on these procedures, and this will be documented through the operator's management systems (ISO 14001 & ISO 50001). This will help ensure compliance with the Environmental Permit as well as other requirements of legislation for the protection of the environment and human health.

Procedures will be developed prior to the site becoming operational and these will be based on existing procedures in place at other Ark permitted sites:

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

3.5.10 Management systems

Once the site is operational, management systems will be developed and implemented based on those utilised by Ark on other permitted sites and will be in line with the principles of the following management standards:

- ISO 14001:2015
- ISO 50001:2018
- ISO 27001:2022
- ISO 9001:2015
- ISO 22301:2019

Once operational, Ark will expand the scope of its existing external certifications for Environmental Management (EMS) and Energy Managements Systems (EnMS) to be implemented based on the ISO 14001:2015 and ISO 50001:2018 to cover this facility. The systems would focus on the following:

- Reducing risks to the environment
- Improving energy efficiency
- Integrating system responsibilities within line management
- A commitment to personnel environmental awareness and competence
- The ongoing monitoring and review of environmental performance.

The management systems will be externally assessed and certified by BSI Ltd.

4.0 CONCLUSION

We consider this to be comprehensive submission that meets the requirements of all relevant EA guidance documentation.

The overall conclusion is that there is unlikely to be a significant impact on human health or the environment from the operation of the listed activities under this permit.

Ark currently holds several other Environmental Permits for other operational Data Centres with permit reference numbers as follows: JP3300SN, PP3003PW and VP3235DJ. Ark is fully committed to operating in accordance with the relevant permit conditions and demonstrating best practice within the Data Centre sector.