

Amazon Data Services UK Ltd

Hemel Hempstead Data Centre – Emergency Back-up Generation Facility

Environmental Risk Assessment - Environmental Permit Application

Reference: 284474-EP-ERA

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This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

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1. Introduction

Ove Arup & Partners Ltd (Arup) has been commissioned by Amazon Data Services UK Ltd (henceforth referred to as ‘the Operator’) to prepare an Environmental Risk Assessment (ERA) to accompany a bespoke application for an Environmental Permit for the Hemel Hempstead Data Centre – Emergency Back-up Generation Facility only (not including the whole Data Centre).

The application is made by Amazon Data Services UK Limited which is the legal entity that will be responsible for operating the generating installation.

The data centre is located at 3A Blossom Way, Hemel Hempstead in the Borough of Dacorum, Hertfordshire.

The purpose of the ERA is to identify any potential significant risks to the environment that may be associated with the proposed operations at the data centre and demonstrate that the associated risks will be acceptable once the proposed mitigation and management are accounted for.

2. Assessment Approach

Risk assessments are an effective tool for identifying potentially hazardous or polluting consequences of activities and providing mitigation systems that reduce the risk of those activities causing pollution.

The assessment aim is it to reduce the potential risk of emissions from the facility or the impact of the emissions on the environment, through specific mitigation measures identified for each specific risk.

The assessment has been completed in accordance with the EA Technical Guidance ‘Risk Assessments for your Environment Permit’¹ dated March 2021, using the following approach:

- Identify and consider risks for your site, and the sources of risks;
- Identify potential receptors which could be affected;
- Identify pathways from the sources of risks to the receptors;
- State any risk control measures; and
- Assess risks relevant to the activities and whether they can be screened out or need further detailed assessment.

As the Hemel Hempstead Data Centre - Emergency Back-up Generation Facility is expected to operate for more than five years, a climate change risk assessment is also provided as part of this Application.

2.1 Identifying Risks

The risk assessment approach is based on the potential frequency or probability of the event occurring and the resulting consequence or potential effect of the event on the environment.

These potential risks however are considered following the implementation of effective controls or mitigation to limit the potential for emissions and/or impacts. Once all of these factors are considered, the overall risk is the residual risk of any impact from the emission, following the mitigation.

As a result, assessment of the following aspects is required, where applicable:

- Risks from emissions to air;

- Risks to surface water from hazardous pollutants;
- Risks to surface water from sanitary and other pollutants;
- Risks to groundwater;
- Noise and Vibration;
- Odour;
- Accidents and fugitive emissions
- Global Warming Impact; and
- Installations must also decide how to treat, recycle or dispose of waste.

3. The Site

3.1 Overview

The site is situated in the Prologis Industrial Park, located in a light industrial and commercial area in Hemel Hempstead. The site location is shown in Figure 1.

The northern boundary of the site consists of a Costa Coffee drive thru and a fitness centre with its adjoining multi-deck car park. There are warehouses to the east; to the west there is a self-storage facility; and to the southwest there is a Travelodge hotel, a car park and open space. Residential properties are located further to the west and south, approximately 100m from the site boundary. Several major roads are located in proximity to the data centre, including the A414 (Breakspear Way) to the south, the A4147 (Maylands Avenue) to the west. The M1 is located 1.2km to the east.

The site was historically occupied by TRW Lucas Aerospace Ltd (1955-2002) and used for the manufacture of power systems for aircraft and military vehicles. It contained a metal plating shop, a spray-painting shop, a solvent degreasing works, heat treatment furnaces and above and below ground fuel and chemical storage tanks. The factory was demolished around the year 2002 and the land remained vacant until 2018 when works were initiated to prepare the land for future development.

A Remediation Method Statement and Materials Management Plan (MMP) was submitted to Dacorum Borough Council (DBC) in April 2020, in response to planning conditions contained with the 2019 Prologis planning consent and the condition was discharged in August 2020 (decision notice ref 20/01581/DRC). This document indicated the presence of no contamination that might require remediation provided suitable management procedures are adopted during the construction.

A Contamination Verification Statement was submitted by Prologis to DBC on 30 November 2021 (reference 21/04489/DRC), and Condition 14 was discharged in Jan 2022 (decision notice ref 20/01581/DRC).



Figure 1: Site location

3.2 Geology, Hydrogeology and Hydrology

Geology

The British Geological Survey (BGS) mapping the geological succession at the site is as indicated in the table below, with mapped extents of outcrop as shown on the figures below. However, ground investigations at the site, discussed in detail in the Site Condition Report (SCR)¹ provided with the EP application, have shown that

¹Site Condition Report – Environmental Permit Application (2022) (Document ref 284474-EP-SCR) Hemel Hempstead Data Centre – Emergency Back-up Generation Facility

the Lambeth Group appears to be generally absent on this site, but the Clay with Flints encountered as the uppermost layer of bedrock geology across the whole of the site. Made Ground was also encountered across the whole site during the ground investigations.

Table 1 Summary of geology from BGS and previous GI

Strata	Location shown on BGS maps	Short description (based on BGS map)	Remarks based on data from GIs	Recorded thickness (m)
Made Ground	Not shown	N/A	Made Ground recorded to generally comprise gravelly clay to sandy gravel.	0.1 to 1.0
Clay-with-flints Formation	Southern and central portion of the site.	Mainly orange-brown and red-brown sandy clay with abundant nodules and rounded pebbles of flint.	Present across entire site	1.0 to 4.7
Lambeth Group (formerly known as Woolwich and Reading Beds)	Northern and central portion of the site.	Vertically and laterally variable sequences mainly of clay, some sands and gravels, minor limestones and lignites and occasional sandstone and conglomerate.	Generally absent in GIs (identified in two holes, but probably in error). Outcrop boundary probably lies to north of site.	0.6 to 10.6
Lewes Nodular Chalk Formation and Seaford Chalk Formation (Undifferentiated) <i>For brevity, referred to in this report as simply "Chalk"</i>	Underlying the Lambeth Group in the northern and central portion of the site and the Clay-with-flints Formation in southern portion of the site.	Chalk with flints.	Present, to depth. Significant dissolution features present on site.	Not proven

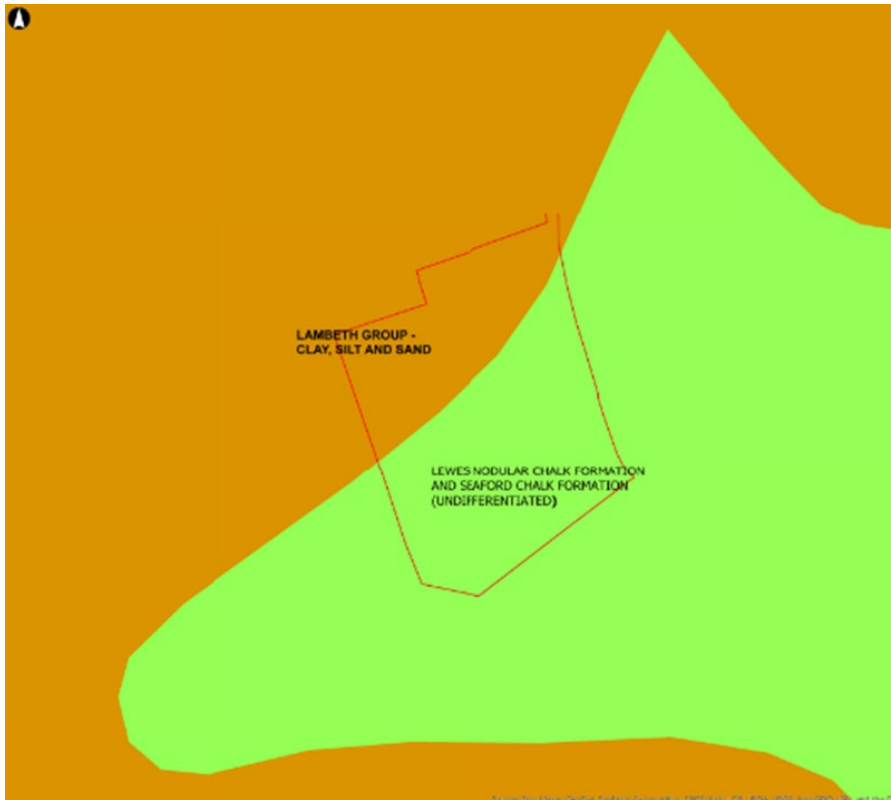


Figure 2 Geology – Bedrock



Figure 3 Superficial Deposits

Hydrogeology

The Environment Agency aquifer designations for the site are:

- Clay with flints Formation is considered to be unproductive strata
- Chalk is a Principal Aquifer

Ground investigations at the site, described further in the SCR¹, have shown that there appears to be no water table as such in the Clay with Flints. Localised pockets of perched groundwater have occasionally been encountered however, the water levels are not considered to be representative of the underlying aquifer but localised seepages from surface water infiltration.

The ground investigations have also shown that the water table in the Chalk is at considerable depth, probably 40-50m depth, and certainly below the base of the ground investigations carried out to date. This is plausible as the site is located on relatively high lying ground.

The site is also located with a Source Protection Zones (SPZ) - Zone 3 or Total Catchment (area around a supply source within which all the groundwater ends up at the abstraction point).

Hydrology

The (EA) Flood Map² indicates that the site is located within Flood Zone 1. This means that the annual probability of flooding from a river or the sea is less than 1 in 1000, i.e. there is less than 0.1% annual probability that the site will suffer from river or sea flooding in a given year.

Regarding groundwater flooding risk, the DBC Strategic Flood Risk Assessment (SFRA) did not identify the site as being at risk from groundwater flooding.

The SFRA does not note any historical flooding occurring within the site. Taking account of all sources, the site is concluded to be at low risk of flooding.

3.3 Ecology and Cultural Heritage

Following the pre-application screening information, the EA provided a Nature and Heritage Conservation Screening Report which sets out the conservation sites which should be considered in the EP Application. Please see drawing titled 284474-EP-DR004 Cultural and Natural Heritage³ for further details. The Screening report is also provided in Appendix 05-02 to the Application.

Ecology

There is one Special Area of Conservation (SAC) within 10km, known as Chilterns Beechwoods. There are multiple non-statutory designated Local Wildlife Sites (LWS) and ancient woodlands within 2 km of the site. Further details can be found in Table 2.

Cultural Heritage

There is one designated archaeological asset within 250m of the site boundary (a scheduled Romano-Celtic temple complex) and 12 non-designated archaeological and built heritage sites within 500m of the data centre site. It can therefore be concluded that there are no designated archaeological or built heritage assets that will be affected.

² Environment Agency. Flood Map for Planning. Available at <https://flood-map-for-planning.service.gov.uk/> [Accessed April 2022]

³ Cultural and Natural Heritage (drawing ref LHR095-ARP-00-XX-DR-EP-004).

3.4 Sensitive Receptors

A summary of the sensitive receptors with the potential to be affected by the data centre are set out in Table 2.

Table 2 Sensitive Receptors

Receptor Name	Receptor Type	Direction	Approximate Distance at Closest Point (m)
Local Receptors within 500m (see drawing Site Layout and Emission Points⁴)			
Prologis Industrial Park	Commercial/industrial premises	All directions	Adjacent
Boundary Way	Local road network	Southwest	Adjacent
Residential Properties	Residential	Southwest	340
Greenspace	Greenspace	East	220
Ecological and Cultural Heritage Receptors (see drawing Cultural and Natural Heritage³)			
Chilterns Beechwoods	Special Area of Conservation	North-west	8,000
Grand Union Canal, Two Waters to Nash Mills Lane	Local Wildlife Sites	Southwest	3,300
Grand Union Canal/River Gade	Local Wildlife Sites	Northwest	5,500
Widmore Wood	Local Wildlife Sites	West	14,000
Maylands Wood	Local Wildlife Sites	Northwest	540
Blackwater Wood	Local Wildlife Sites	Southeast	2,000
Long Deans Meadow	Local Wildlife Sites	South	2,000
Long Deans Wood	Local Wildlife Sites	South	2,000
Paradise Fields Central	Local Wildlife Sites	Southwest	1,300
Disused Railway Line, Hemel Hempstead	Local Wildlife Sites	Northeast	2,300
Rant Meadow Wood/Bennets End Pit	Local Wildlife Sites	Southwest	1,100
Holy Trinity Church, Leverstock Green	Local Wildlife Sites	South	750
Westwick Row Wood	Local Wildlife Sites	Southeast	1,200
Widmore Wood	Ancient Woodland	West	14,00
Maylands Wood	Ancient Woodland	Northwest	540
Blackwater Wood	Ancient Woodland	Southeast	2,000

⁴ Site Layout and Emission Points (drawing ref LHR095-ARP-00-XX-DR-EP-002).

4. Environmental Risk Assessment

4.1 Overview

The following tables in this section assess the potential risk to receptors from the following hazards, taking into account the measures proposed to reduce those risks.

The method relies on a scoring system that is based on the frequency or probability of the event occurring and the resulting consequence or potential effect of the event on the environment (see Figure 4).

Controls or mitigation are also identified in the assessment, which consist of measures or actions that can be carried out to limit the potential for impacts.

The probability of exposure is the likelihood of the receptors being exposed to the hazard, and is defined as low, medium or high. These terms are qualified as follows:

- Low: exposure is unlikely, barriers in place to mitigate against exposure;
- Medium: exposure is fairly probable, barriers to exposure less controllable; and
- High: exposure is probable, direct exposure likely with few barriers.

The aim is it to reduce the risk of fugitive emissions from the facility or the impact of the emissions on the environment, through specific mitigation measures identified for each specific risk.

Control and mitigation measures have been identified for all risks identified in the assessment, based on the Best Available Techniques (BAT) measures set out in the guidelines and on operational experience. The measures specific to each risk are described in the assessment. The mitigation measures will be incorporated into the site management processes and site operatives will be made aware of these measures during training.

More general mitigation measures to avoid emissions, in line with indicative BAT standards, are also set out in the relevant sections of the Summary Technical Report (Document Reference 284474-EP-STR).

Consequence	Exposure probability		
	Low	Medium	High
Low	Low Risk	Low Risk	Medium Risk
Medium	Low Risk	Medium Risk	High Risk
High	Medium Risk	High Risk	High Risk

Figure 4 Risk Assessment Matrix

4.2 Primary risks

The primary risks to the environment as a result of the Installation are considered to be from emissions to air as a result of the diesel-fuelled generator use, together with the potential for leaks from the associated fuel tanks and delivery systems affected water and land. These items are set out in the tables below in Section. 1.1.

Other potential environmental risks are also covered including Noise and Vibration, Odour, Accidents and fugitive emissions and Global Warming Impact.

4.3 Emissions to water

There are no point source emissions to and from the generators or associated fuel storage.

4.4 Waste generation

There will be no industrial waste generated on-site and therefore it is not discussed any further in this risk assessment.

Minimal solid waste generation is anticipated on site. In general staff will only be required on site during testing and routine inspections. All staff will be trained in waste management procedures by their supervisors.

All wastes produced during maintenance tasks will be immediately removed by vendors (specialist contractors) from the installation following completion of the relevant maintenance task.

4.5 Risk Assessment Tables

The following section contains the assessment tables following the EA's risk assessment approach for potential factors which could cause environmental impact.

Table 3 Emissions to air

Hazard / Process	Receptor	Pathway	Risk reduction measures	Exposure probability	Potential consequences	Overall risk
Emissions from generator stacks during routine maintenance/testing; emergency outage	Receptors identified in drawings Environmental Site Settings ⁵ and Cultural and Natural Heritage ³ .	Air	<p>A detailed air quality assessment has been undertaken and is provided as part of this Application (reference). The assessment looks at both routine testing and emergency scenarios (up to 68 hours run-time) and concludes no significant impacts are likely as a result of the operation of the generators.</p> <p>The planned testing and maintenance regime is for a total of 19 hours per year per generator, which is below the desired 50 hours per generator, and well below the 500 hours per generator as per the MCPD.</p> <p>A stack height assessment was undertaken as part of the design process where the height of 25m was considered the best solution to minimise potential impacts. The diesel generators have been assessed and are considered to be in-line BAT (see STR document⁶) meeting the TA Luft 2g equivalent emission limits. Monitoring ports will be installed on the stacks to allow for flue gas measurements.</p> <p>Plant will be maintained in line with manufacturer's recommendations. This includes checking for deterioration of plant conditions. Repairs will be undertaken as appropriate to rectify any identified defects.</p> <p>Where an emergency scenario occurs, the local authority and EA will be informed immediately. The operator will also develop an Air Quality Emergency Action Plan (AQEAP) which will detail the management actions to be taken in the event of an emergency outage.</p>	Low due to optimized stack height design, limited operational hours and regular maintenance.	Low adverse impact on human health and ecological receptors in surrounding area	Low

⁵ Environmental Site Settings (drawing ref LHR095-ARP-00-XX-DR-EP-003).

⁶ Summary Technical Report – Environmental Permit Application (2022) (Document ref 28447-EP-STR) Hemel Hempstead Data Centre – Emergency Back-up Generation Facility

Visible generator emissions during start-up	Receptors identified in drawings Environmental Site Settings ⁵ and Cultural and Natural Heritage ³ .	Air	<p>Plant will be maintained in line with manufacturer's recommendations. This includes checking for deterioration of plant conditions. Repairs will be undertaken as appropriate to rectify any identified defects.</p> <p>The operator will implement visual checks for visible emissions from the generators during start up.</p> <p>Visible plumes are not anticipated to occur for the majority of operational time due to the diesel being combusted and resulting high exhaust gas temperatures.</p> <p>The engines will not be in operation for the majority of the time and therefore there would be zero visible plume during this time.</p> <p>Any visible plumes observed during normal operation will be reported and investigated.</p>	Low due to limited operational hours and regular maintenance.	Low adverse impact on human health receptors in surrounding area	Low
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Table 4 Fugitive emissions

Hazard / Process	Receptor	Pathway	Risk reduction measures	Exposure probability	Potential consequences	Overall risk
To air						
Vapour release through leakages from fuel tanks and pipes during fuel delivery	On-site staff. Off-site receptors identified in drawings Environmental Site Settings ⁵ and Cultural and Natural Heritage ³ .	Air	<p>All tanks, pipes and valves are designed to appropriate industry standards and flanged connections between pipes are kept to a minimum by the proximity of the tanker fill point. The underground fuel pipe between the top-up tank to the bunded generator area is double skinned pipe-in-pipe with leak detection.</p> <p>All tanks, silos, pipes and valves have a preventative maintenance programme to ensure ongoing integrity and effectiveness.</p> <p>Fuel tank filling will be carried out by trained fuel tanker drivers. This removes any significant risk of vapour release and spillages during deliveries.</p> <p>The diesel tanks will be fitted with vents however these will only allow minimal potential for fumes to escape.</p> <p>No other oils will only be stored on site. Lubricating oil is present within the generators but this will be within a closed loop system with no emissions.</p>	Low due to design and on-site management processes.	Low adverse impact on human health and ecological receptors in surrounding area	Low
Dust generating activities or dusty materials	Off-site receptors identified in	Air	There are no significant dust-generating activities or dusty materials used or stored within the installation.	Low due to design and on-site	Low adverse impact on human health and	Low

	drawings Environment al Site Settings ⁵ and Cultural and Natural Heritage ³ .		In the event of a complaint, the operator will follow a complaints procedure to record the complaint and take appropriate action or provide further monitoring as necessary.	management processes.	ecological receptors in surrounding area	
To water and land						
Spillage of waste, fuels or other materials	Water / Land	Surface water / ground water	<p>The top-up tank and generator belly tanks are enclosed, integrally banded to 110% above ground and fitted with telemetry which allows instant accurate assessment of the filling level. All tanks will be fitted with leak detection and high-level alarms to avoid overfilling.</p> <p>All tanks, pipes and valves are designed to appropriate industry standards and flanged connections between pipes are kept to a minimum by the proximity of the tanker fill point. The underground fuel pipe between the top-up tank to the banded generator area is double skinned pipe-in-pipe with leak detection. Fuel tank filling will be carried out by trained fuel tanker drivers. This removes any significant risk of spillages and leaks</p> <p>The operator will carry out daily checks for signs of leakage.</p> <p>All fuel storage/refuelling and car park hardstanding have a site drainage system passes through one of two oil interceptors with automatic close upon detection of oil. The top up fuel tank also has a sump-pump for surface water removal, which is connected to the oil interceptor before discharge to foul.</p> <p>The top-up tank refuelling area is on slab / hardstanding with a depression/slope to the drain and oil interceptor.</p> <p>High standards of housekeeping will be maintained across the site.</p> <p>Trained personnel will ensure that any spills are cleaned as soon as practicable with the correct safety measures being taken.</p> <p>Spill kits will be available to deal with any leaks.</p> <p>Relevant spill response equipment will be situated at various locations around the site, designed for the particular hazard characteristics of the materials (fuel) present. All spillages will be logged, investigated and corrective action will be taken.</p>	Low due to design and on-site management processes.	Medium adverse impact on ground / water courses	Low

Leaks from tanks, containers or pipework	Water / Land	Surface water / ground water	<p>The top-up tank and generator belly tanks are enclosed, integrally banded to 110% above ground and fitted with telemetry which allows instant accurate assessment of the filling level.</p> <p>All tanks, pipes and valves are designed to appropriate industry standards and flanged connections between pipes are kept to a minimum by the proximity of the tanker fill point. The underground fuel pipe between the top-up tank to the banded generator area is double skinned pipe-in-pipe with leak detection.</p> <p>Fuel tank filling will be carried out by trained fuel tanker drivers. This removes any significant risk of spillages and leaks.</p> <p>The operator will carry out daily checks for signs of leakage.</p> <p>Spill kits will be available to deal with any leaks.</p>	Low due to design and on-site management processes.	Medium adverse impact on ground / water courses	Low
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Table 5 Nuisance

Hazard / Process	Receptor	Pathway	Risk reduction measures	Exposure probability	Potential consequences	Overall risk
To water and land						
Mud/litter carried onto highway	Water Land	Public	All internal roads, storage and processing areas will be hard-surfaced with concrete or tarmac and swept when required.	Low due to design and on-site management processes.	Low adverse impact on ground / water courses	Low
Pest, vermin and scavengers	Land	Staff Public	Waste that is likely to attract pests, vermin and scavengers will be transferred to the main waste handling area. The facility will contract a local specialised company to implement a pest control management plan. This will include vermin, flies and birds.	Low due to design and on-site management processes.	Low adverse impact on ground / water courses	Low
Waste generation	Land	Staff Public	Minimal solid waste generation is anticipated on site. In general staff will only be required on site during testing and routine inspections. All staff will be trained in waste management procedures by their supervisors. All wastes produced during maintenance tasks will be immediately removed by vendors (specialist contractors) from the installation following completion of the relevant maintenance task.	Low due to design and on-site management processes.	Low adverse impact on ground / water courses	Low

Table 6 Noise

Hazard / Process	Receptor	Pathway	Risk reduction measures	Exposure probability	Potential consequences	Overall risk
Noise from operation of generators during routine maintenance / testing; emergency outage	On-site staff. Off-site receptors identified in drawings Environmental Site Settings ⁵ and Cultural and Natural Heritage ³ .	Air	<p>For ‘normal’ and ‘generator testing’ operational scenarios, the results show that predicted plant noise would not exceed the noise emission limits during the day and night-time periods at the nearest sensitive receptors. Testing would only occur during day-time periods.</p> <p>During a full emergency scenario (scenario 4), the predicted plant noise levels marginally exceed the noise emission limits at two receptor locations. However, given the small magnitude of the exceedance, the rarity of this event and assumed short term duration of such an emergency event, this is not expected to cause an adverse effect at the nearest sensitive receptors</p> <p>Staff training will include raising employee awareness with respect to normal plant operational noise levels and actions to be taken to rectify any faults.</p> <p>Plant will be maintained in line with manufacturer's recommendations. This includes checking for deterioration of plant conditions (e.g. bearings becoming worn). Repairs will be undertaken as appropriate to rectify any identified defects.</p>	Low due to design mitigation, limited operational hours and regular maintenance.	Statutory nuisance - medium	Low
Noise from vehicles delivering fuel	On-site staff. Off-site receptors identified in drawings Environmental Site Settings ⁵ and Cultural and Natural Heritage ³ .	Air	<p>HGV reversing will be minimized where possible.</p> <p>Fuel deliveries will be in daytime working hours to minimize potential disturbances out of hours.</p> <p>Engines will be switched off when not in use.</p> <p>Personnel responsible for the generator installation will be part of the staffing of the wider data storage installation site therefore there will be no additional staff vehicle movements over and above those employed within the adjacent data centre.</p> <p>Additional vehicle movements will be associated with planned maintenance and deliveries which will take place during normal working hours. In the event of a</p>	Low due to on-site management processes.	Statutory nuisance - low	Low

			complaint, the operator will follow a complaints procedure to record the complaint and take appropriate action or provide further monitoring as necessary.			
Vibration from the installation	On-site staff. Off-site receptors identified in drawings Environmental Site Settings ⁵ and Cultural and Natural Heritage ³ .	Ground	Significant vibration effects are not anticipated for the installation. In the event of a complaint, the operator will follow a complaints procedure to record the complaint and take appropriate action or provide further monitoring as necessary.	Low due to design mitigation, limited operational hours and regular maintenance.	Statutory nuisance - low	Low

Table 7 Odour

Hazard / Process	Receptor	Pathway	Risk reduction measures	Exposure probability	Potential consequences	Overall risk
Odour from loading and storage of fuel	On-site staff. Off-site receptors identified in Environmental Site Settings ⁵ and Cultural and Natural Heritage ³ .	Air	Fuel tank filling will be carried out by trained fuel tanker drivers. Staff training will include raising employee awareness with respect to normal plant operational odour levels and actions to be taken to rectify any faults.	Low due to on-site management processes.	Statutory nuisance – low	Low
Odour release from combustion plant	On-site staff. Off-site receptors identified in Environmental Site Settings ⁵ and Cultural and Natural Heritage ³ .	Air	Regular maintenance of the generators will reduce the level of emissions from the combustion process.	Low due to on-site management processes.	Statutory nuisance - low	Low

Table 8 Accidental releases

Hazard / Process	Receptor	Pathway	Risk reduction measures	Exposure probability	Potential consequences	Overall risk
Fuel delivery						
Major vehicle accident – leading to a significant loss of fuel	On-site staff. Off-site receptors identified in Environmental Site Settings ⁵ and Cultural and Natural Heritage ³ .	Air Ground Water	<p>Traffic entering site will be managed by the reception.</p> <p>The internal road layout is designed to accommodate the vehicles that will visit the facility. Junction radii, carriageway widths and layouts are designed to minimise the risk of vehicle conflicts.</p> <p>The use of mobile phones will be prohibited during driving.</p> <p>Drainage will be regularly maintained to keep standing water off roads and site roads will be cleaned regularly to remove any scum, oils etc</p>	Low due to on-site management processes.	Medium adverse impact on air / ground / water courses	Low
Fuel tanks overfill	On-site staff. Off-site receptors identified in Environmental Site Settings ⁵ and Cultural and Natural Heritage ³ . Water	Ground Water	<p>The top-up tank and generator belly tanks are enclosed, integrally bunded to 110% above ground and fitted with telemetry which allows instant accurate assessment of the filling level.</p> <p>All tanks, pipes and valves are designed to appropriate industry standards and flanged connections between pipes are kept to a minimum by the proximity of the tanker fill point.</p> <p>The underground fuel pipe between the top-up tank to the bunded generator area is double skinned pipe-in-pipe with leak detection.</p> <p>Fuel tank filling will be carried out by trained fuel tanker drivers. This removes any significant risk of spillages and leaks.</p> <p>The operator will carry out daily checks for signs of leakage.</p> <p>Spill kits will be available to deal with any leaks.</p>	Low due to on-site management processes.	Medium adverse impact on air/ ground / water courses	Low
General site issues						
Fire	On-site and human and ecological receptors.	Air /Land/Water	<p>The site will benefit from a fire alarm system and associated fire suppression systems inside the data centre building. The generator containment units themselves will each have independent fire suppression systems.</p> <p>Each engine will be fitted with a weighted slam-shut valve with a fusible link across the top of each engine. In the event of a fire, the link will melt and the valve will drop, shutting off</p>	Low	Medium adverse impact on environment	Low

Hazard / Process	Receptor	Pathway	Risk reduction measures	Exposure probability	Potential consequences	Overall risk
			<p>the fuel supply. These systems will link to the site security office where personnel will alert relevant employees and call the Fire and Rescue Service (FRS) to attend if necessary.</p> <p>The top-up tank and generator belly tanks areas are enclosed, integrally bunded to 110% above ground, with surface water drainage passing through an oil interceptor before any discharge. The top up fuel tank also has a sump-pump connected to the oil interceptor before discharge to foul.</p> <p>Sprinkler tanks and pumps will be installed on-site.</p> <p>Emergency Procedures will be developed as part of the EMS; these will detail the actions to be taken in the event of a fire.</p>			
Security and Vandalism	On-site and human and ecological receptors.	Air/land/ water	<p>The site will be secured by a perimeter fence and lockable gates.</p> <p>Access will only be available via a secure entrance requiring reporting to the site reception.</p> <p>In addition, CCTV equipment on mounting poles are positioned around the external and internal fence perimeters.</p> <p>The site will be staffed by security personnel 24 hours a day.</p>	Low	Allow adverse impact on environment	Low
Flooding	On-site and human and ecological receptors.	Water/Land	<p>Surface water drainage design includes consideration of potential flooding events. An additional attenuation tank will be installed alongside the current attenuation tank on-site, both of which will discharge to the on-site attention pond / basin before discharge to the main network off-site.</p>	Low	Low adverse impact on environment	Low

Table 9 Global Warming Potential

Hazard / Process	Receptor	Pathway	Risk reduction measures	Exposure probability	Potential consequences	Overall risk
Generation of CO ₂ e emissions	National and global climate change	Air	<p>Operation of the generators will involve the combustion of diesel fuel to generate electricity for use at the site in the event of an emergency power outage.</p> <p>The generators will be subject to planned maintenance and testing.</p> <p>The combustion of diesel during maintenance and testing will result in the generation of CO₂e emissions of 528 tonnes per year.</p> <p>This is based on the operational regime and generator fuel use set out in the Summary Technical Report, resulting in 2111MWh/yr of delivered energy from Gas oil (diesel), with a CO₂ factor of 0.25 from H1 Annex F.</p> <p>AWS participates in a Climate Change Agreement for the data centre sector.</p>	Low	Low adverse impact on environment	Low

5. Adaptation to Climate Change Risk Assessment

5.1 Screening

An adapting to climate change risk assessment (CCRA) is required for new bespoke Installation EP applications if the Installation is expected to operate for more than five years. A CCRA must be completed even if it is possible that the Installation will not be operational in 2050 as predicted climate changes, which can potentially be extreme, may be experienced before this time.

The data centre will be operational for more than five years from the date of this EP application and therefore CCRA screening has been completed, as detailed in Table 10.

In-line the guidance, if the total screening score is 5 or more, the applicant must complete the climate change risk assessment and submit it with your permit application. As the screening score is 5 the details of the CCRA are set out below in Section 5.2.

Table 10 Climate Change Risk Screening

CATEGORY	SCREENING QUESTIONS	SCORE	YOUR SCORE
1 TIMESCALES	How long will a permit be required for this site/activity? 5 years or less of operation. No need to fill in the rest of the screening. You do not need to fill in a risk assessment. Please go straight to question 7. Less than 20 years of operation Until between 2040 and 2060 (between 20 and 40 years from now) Until 2060 or beyond (more than 40 years from now)	0 1 3 5	3
2 FLOODING	What is your site's risk of flooding from rivers or the sea? Not in a flood-risk zone Very low or Low Medium High	0 1 2 5	1
3 WATER USE	If you use water for your site operations or fire prevention, what is the source of your water? Water not required Mains water Surface water or groundwater abstraction	0 1 5	1
TOTAL SCREENING SCORE			5

5.2 CCRA

The data centre will be located in the Thames River Basin District and therefore the relevant completed risk assessment worksheet is presented in Appendix 05-01⁷.

Based on the 'potential changing climate variables' presented in the worksheet and the potential impact on operations at the data centre, specifically related to the diesel-fired generators and diesel storage, the overall risks are considered to be low, with risk scores ranging from 1 – 3.

These scores are below the threshold whereby mitigation measures are required to ensure operational resilience against potential climate change impacts.

The risk assessment worksheet will be included in the site Environmental Management System and will be subject to regular update where necessary to ensure risks can be minimised.

⁷ Provided as Appendix 05-01 to the EP Application Climate Change Risk Assessment Worksheet -Thames river basin district: climate change risk assessment