Thorney Lane Data Centre Emergency Back-Up Generation Facility

Environmental Permit Application EPR/SP3224LP
Environmental Risk Assessment

Amazon Data Services UK Limited

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Glossary

Glossary/ Abbrevation	Term
AMP	Accident Management Plan
BAT	Best Available Techniques
BGS	British Geological Survey
CCTV	Closed Circuit Television
CO	Carbon Monoxide
CO_2	Carbon Dioxide
EA	Environment Agency
EMS	Environmental Management System
EPR	Environmental Permitting Regulations
ER	Ecological Receptor
ERA	Environmental Risk Assessment
FAQ	Frequently Asked Questions
FRS	Fire Rescue Service
GWP	Global Warming Potential
HC	Hydrocarbon
HR	Human Receptor
ID	Identity
IED	Industrial Emissions Directive
IET	Institution of Engineering and Technology
MCP	Medium Combustion Plant
MWth	Megawatts thermal
NOx	Nitrogen Oxides
NPPF	National Planning Policy Framework
NVZ	Nitrate Vulnerability Zones
OPV	Overfill Protection Valve
PAT	Portable Appliance Testing
PC	Process Contribution
PEC	Predicted Environmental Concentration
PM	Particulate Matter
POCP	Photochemical Ozone Creation Potential
PTW	Permit To Work
RAMS	Risk Assessments and Method Statements
SAC	Special Area of Conservation
SCR	Selective Catalytic Reduction
SOP	Standard Operating Procedure
SOx	Sulphur Oxides
SPA	Special Protection Area
SPZ	Source Protection Zone
SSG	Institution of Engineering and Technology
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage System
UK	United Kingdom

1. Report Context

1.1 Introduction

AECOM Limited ('AECOM') has been commissioned by Amazon Data Services UK Ltd ('the operator) to prepare an application for an environmental permit under the Environmental Permitting (England and Wales) Regulations 2016, as amended ('EPR') for the emergency back-up generation facility for the proposed data centre at Thorney Business Park, Thorney Lane North, Iver in Buckinghamshire. The environmental permit will be for the operation of emergency backup generators and associated fuel storage and handling ('the Proposed Installation')

This document is the Environmental Risk Assessment (ERA) which has been prepared to identify any potential significant environmental risks associated with the Proposed Installation activities and demonstrate that associated impacts will be acceptable following application of appropriate mitigation and management.

1.2 Proposed Installation

The Environmental Permit application will be made for the combustion activities (including fuel storage and handling) associated with emergency backup generators only and not the wider data centre operations. The installation boundary for the Environmental Permit will include the areas covered by these activities only.

The wider data centre development consists of the construction of commercial buildings to comprise the data centres, ancillary offices, associated plant, equipment and emergency backup generators and associated fuel storage, landscaping, sustainable drainage systems and parking.

A bank of emergency generators will be provided to support the data centre operation in the event of a power outage. Each individual generator will be classed as medium combustion plant (MCP) with an aggregated thermal input for the site which will exceed 50 megawatts thermal (MWth).

The installation will include 36 containerised generators to provide backup power supply for the main two data centre buildings, a smaller 'house' generator for each building to cover non critical operations in an emergency such as offices, the proposed generator fuel storage and handling areas, and associated emission points only.

2. Risk Assessment

2.1 Introduction

This section outlines the approach taken to evaluate the risks to the environment and to human health associated with the operation of the data centre emergency backup generators.

The impact evaluation process has referred to the appropriate guidance within:

- The EA Guidance "Risk Assessments for your Environmental Permit" last updated December 2025[1]; and
- Adapting to climate change: industry sector examples for your risk assessment[2] last updated May 2023.

2.2 Impact Assessment Methodology

The evaluation methodology used involves three stages:

1. ***Source characterisation***, to identify the potential hazards and risks associated with the operation of the facility. This is covered in detail in Section 3 below, but broadly covers:
   a. Point source emissions to air, land and water;
   b. Amenity issued including fugitive emissions to air, land and water and odour
   c. Noise and vibration;
   d. Abnormal operations and accidents; and
   e. Climate change impacts.

2. ***Receptor evaluation***, to review the receptors which could be impacted by the hazards and risks from the operation of the facility Receptors are discussed in more detail in Section 4, but broadly covers:
   a. Residential, commercial and industrial human receptors;
   b. Habitat receptors associated with designated and other sensitive sites; and
   c. Location related receptors associated with site geology, hydrogeology and hydrology.

3. ***Risk assessment*** which evaluates the hazards and risks in terms of the probability of occurrence and the severity of the impact on the identified receptors. The risk assessment also summarises the management plan approach that will be used to mitigate the identified risks.

[1] Environment Agency, "Risk Assessments for your Environmental Permit", December 2025
[2] Environment Agency, "Adapting to climate change: industry sector examples for your risk assessment", May 2023

3. Source Characterisation

3.1 Emissions to Air, Water and Land

3.1.1 Point Source Release to Air

The primary point source emissions to air are associated with the operation of the diesel-fired backup generators, which are intended for emergency use and periodic testing. The main parameters considered are associated with the release of combustion gases during generator operation which include:

- Oxides of nitrogen (NOx)
- Carbon monoxide (CO)
- Particulate matter
- Hydrocarbons.

A screening assessment using the EA's H1 screening[3] tool was completed and is presented in Section 5.

3.1.2 Point Source Release to Land

Surfacing around the area of the generators, fuel storage and loading which is all the area within the installation boundary will be surfaced in concrete with kerbing and equipped with dedicated drainage that will gravitate to the foul sewer via Class 1 interceptors.

There will be no soakaways within the installation boundary. Consequently, no direct emissions to land will occur as a result of the operation of the Proposed Installation. Regular inspections of the hardstanding areas and drainage systems will be carried out to identify and repair possible damage and prevent any potential releases to land.

3.1.3 Point Source Release to Water

3.1.3.1 Discharge to Sewer

Rainwater from the generator areas and fuel loading and storage areas will be collected in dedicated drainage channels and gravitated to the foul drainage network via c Class 1 full retention fuel and oil separators. There are four interceptor serving the generator yards and fuel loading areas – the exit from each interceptor has been designated the release point to sewer (S1 – S4) Discharges from the separators will be monitored prior to discharge to the wider foul sewer network to ensure releases are free from fuel. There is no further assessment of releases to sewer in this document.

3.1.3.2 Discharge to Surface Water

No surface run off from the generator yard and fuel, loading areas will enter the surface water drainage system. Consequently, no direct emissions to surface water will occur as a result of the operation of the Proposed Installation.

3.1.3.3 Point Source Release to Groundwater

There are no point source emissions to groundwater from the Proposed Installation.

3.2 Amenity Risks

The assessment of the amenity risks presented in this section is presented in section 6.3.2.

[3] Environment Agency, " H1 Software", version 2.7.8, January 2017

3.2.1 Fugitive Release to Air, Land or Water

The risk of dust and particulate accumulation is low at the Proposed Installation given the nature of the activities and the materials handled. There is, however, potential for materials used in soft landscaping areas on the wider site to become windblown and for windblown materials to deposit from areas external to the site.

There is the potential for fugitive releases of diesel and lubricants primarily during maintenance activities and pipeline routes will include flange joints and over time there is potential for these to deteriorate resulting in fugitive releases at the joints.

The site will maintain appropriate maintenance procedures, housekeeping standards and spill response procedures which will reduce the impact.

In relation to pipeline routes, prevention and mitigation is achieved through:

- Flanges will be kept to a minimum.
- Fuel pipelines will have a pipe-in-pipe arrangement with leak detection to minimise risk of leaks.
- Routing of pipework above ground so that leaks would be visible.
- Use of materials with anti-corrosive properties for pipework to minimize leaks.

3.2.2 Litter

There are no activities associated with the backup generators that are expected to give rise to litter. No waste or packaging is stored externally as part of these operations, and all maintenance-related materials will be stored appropriately within the installation boundary.

3.2.3 Mud and Debris

There are no anticipated sources of mud or debris generation from the generator area, which is surfaced with hardstanding. Vehicle movements associated with generator operation and maintenance are limited and are not expected to result in the transfer of mud or debris beyond the installation boundary.

3.2.4 Odour

The probability of exposure to odours is considered negligible, as the installation is not anticipated to have any notable source of odour. Any fugitive emissions from leaks/spills would be primarily associated with maintenance activities which will be managed and maintained according to established procedures, reducing the risk of leaks.

3.3 Noise

The following have been identified as potential noise and vibration sources:

- Fans (including inlets, outlets, stacks, and enclosures);
- Pumps, drives and motors;
- Exhaust stacks; and
- Generator engines.

General nuisance considerations from noise have been considered in the risk assessment in Section 6.3.2 for completeness. However, a separate detailed noise modelling assessment in accordance with EA Guidance has been completed and is presented in Application Part 8.

3.4 Visible Plumes

The occurrence of a visible plume is dependent on atmospheric conditions such as ambient temperature and humidity, and may be more likely during colder weather when water vapour condenses upon release. However, the risk of visible plumes from standby generators are low due to generally limited operating hours, preventative maintenance strategies and infrequent use. The assessment of visible plumes is presented in Section 6.3.3.

3.5 Accidents, Incidents and Abnormal Operations

The following potential abnormal operations and emergency situations have been identified for the current operations:

- Transfer of substances including transfer of materials from containers during maintenance;
- Fuel tanks overfill;
- Security breach and vandalism;
- Fuel containment failure ;
- Tank Rupture;
- Failure of plant and equipment (for example faulty pipework, blocked drains);
- Making the wrong connections in drains or other systems;
- Extreme weather conditions, such as flooding or very high winds;
- Failure of main services;
- Operator error; and
- Major vehicle accident.

A risk assessment covering these issues is presented in Section 6.3.4

3.6 Fire Risk

In addition to the above abnormal operations and emergency situations, specific considerations has been given to fire risk associated with the following:

- Ignition of diesel vapours from leaks or spills near generator engine or electrical components;
- Arson and vandalism;
- Naked lights or flames;
- Discarded smoking materials;
- Hot works;
- Electrical fault within generator sets causing fire
- Combustion of surrounding debris (e.g., oily rags, packaging) during maintenance
- Containment of fire water.

A risk assessment covering these issues is presented in Section 6.3.5.

3.7 Climate Change Risk

In line with the “Adapting to Climate Change: Risk Assessment for Your Environmental Permit”[2] guidance on the www.gov.uk website, as the site has operations beyond 2050, uses mains water for site operations including fire risk and is in a low flood risk zone, consideration

has been given to risk associated with the impacts that need to be considered from a changing climate. These include:

- Increased extreme rainfall intensity (up to +45–50% by mid-century under UKCP18) affecting drainage capacity and potential overflow from fuel containment systems;
- Higher peak river flows and more frequent flash flooding may increase chance of diesel-contaminated runoff escaping via surface water drains;
- Warmer temperatures (average summer max +2.4 °C by 2050) could reduce cooling efficiency in diesel engines, potentially increasing emissions;
- Changes in temperatures in the winter with the potential for more extreme temperatures both warmer or colder than present could lead to plant and pipelines freezing;
- Longer periods of drought followed by intense rainfall may lead to sediment-laden run-off, potentially clogging filters or interceptors during dry spells;
- Average winter rainfall increasing leading to higher risk of flood event; and
- More severe storms or high winds may dislodge plantroom or storage infrastructure, posing increased risk of spillage or fire.

Mitigation measures for climate-related hazards will follow Environment Agency sector guidance, including adaptation planning for +2 °C (2050) and +4 °C (2100) scenarios, review of drainage design (SuDS), maintenance of bund integrity, and emergency response planning.

4. Receptor Identification

The site is at Thorney Business Park, Thorney Lane North, Iver, Buckinghamshire. It is located approximately 1.2km south of Iver town centre and is accessed via the Thorney Lane North Road. The co-ordinates are 51°30’33.99 N x 00°31’05.69 W.

The site is located approximately 27km west of London City Centre and 5km east of Slough. Heathrow Airport is approximately 6km south-east. Grand Union Canal Slough Arm borders the subject site immediately to north, with the Great Western Rail Line immediately south.

The site is surrounded by the London Green Belt, with agricultural fields to the north, west and south-west across the Grand Union Canal Slough Arm. Scrub lands are located directly to the east and are designated as Green Belt.9

Potential receptors which could be impacted by the operations of the Proposed Installation include:

- Residential, commercial and industrial human receptors;
- Habitat receptors associated with designated and other sensitive sites; and
- Location related receptors associated with site geology, hydrogeology and hydrology.

4.1 Human Receptors

The receptors are selected to be representative of residential dwellings, recreational areas and schools in the area around the Proposed Installation. A list of the human receptors within 2km of the Proposed Installation are shown in Table 1 below.

Table 1. Human Receptor Locations

Receptor ID	Description	Minimum Distance from the Generator Emission Points Within Installation Boundary
HR1	Residential at Bathurst Walk	330m Southeast
HR2	Residential at Bathurst Walk	325m Southeast
HR3	Residential at Bathurst Walk	519m Southeast
HR4	Residential by the Grand Union Canal Slough Arm	395m West
HR5	Residential at Southwold Spur	807m West
HR6	The Langley Heritage Primary School	1.19km Southwest
HR7	Residential at Leacroft Road	957m North
HR8	Residential at Mansion Lane	689m Northwest
HR9	Residential at Parlaunt Road	1.09km Southwest
HR10	Residential at Thorney Lane North	974m East
HR11	Residential at North Park	780m South
HR12	Residential at Syke Cluan	550m Southeast
HR13	Residential at High Street	1.2km North
HR14	Iver Village Nursery	1.24km North
HR15	Residential at Thorney Lane North	1.03km East
HR16	Residential by the Grand Union Canal Slough Arm	331m West
HR17	Residential at James Walk	495m Southeast
HR18	Residential at Addison Close	964m North
HR19	Residential at Cherry Close	1.09km Northeast

Receptor ID	Description	Minimum Distance from the Generator Emission Points Within Installation Boundary
HR20	Residential at Barnes Way	1.05km Northeast
HR21	Residential at Mansion Lane	585m Northwest
HR22	Residential at Langley Park Road	1.01km North
HR23	Residential at North Park	885m South
HR24	Residential at Market Lane	755m West

4.2 Sensitive Environmental Habitats

EA guidance requires that the effects of stack emissions on designated ecological sites be assessed where they fall within set distances of the source, up to 10km for European designated sites and up to 2km for nationally designated sites.

Statutory designated sites have been identified through a desk study of the Defra Magic mapping website, which identifies SSSIs, Ramsar sites, SPAs and SACs.

Sensitive nature conservation receptors within 10km of the site boundary used in the Air Quality Assessment are listed within Table 2 below.

Table 2. Sensitive Ecological Receptors

Receptor ID	Description	Minimum Distance from Generator Emission Points
ER1	Burnham Beeches Special Area of Conservation (SAC and SSSI)	8.5km northwest
ER2	Windsor Forest & Great Park SAC	7.9km southwest
ER3	South West London Waterbodies SAC	6.0km south
ER4	Richings Park (Ancient Woodland)	1,624m south
ER5	Billet Lane Woodland (Ancient Woodland)	2,228m northwest

4.3 Location Related Considerations

4.3.1 Geology

According to the publicly available data from the BGS Geology Viewer and Groundsure Report (Ref. GS-S4B-X4B-3JZ-GSX, dated 19th June 2025), the Proposed Installation sits on the edge of the London Basin and is considered worked ground (i.e. has been artificially lowered through anthropogenic activity). Superficial deposits of Lynch Hill Gravel are underlain by a bedrock succession of London Clay.

A summary of the geological succession across the site is presented in the Table 3 below.

Table 3. Summary of Anticipated Geology

Geology	Description (according to the BGS Lexicon of Named Rock Units)	Expected Location
Artificial and made ground		
Worked Ground	Worked Ground is an area where the land surface (natural or artificial) has been lowered as a result of man-made excavations. The purpose of the excavation is unspecified. Composition: void.	Present across the whole Proposed Installation area.
Superficial Deposits		
Lynch Hill Gravel Member - Sand and Gravel	The Lynch Hill Gravel Formation, now commonly referred to by its updated classification, comprises predominantly sand and gravel deposits, occasionally interspersed with lenses of silt, clay, or peat. These sediments rest unconformably atop the underlying bedrock geology, marking a clear stratigraphic boundary. Geographically, the formation is confined to the Thames Valley and its associated tributaries, where fluvial processes historically shaped its distribution and composition.	Present across the whole Proposed Installation area.
Bedrock		
London Clay Formation	The London Clay Formation is characterised by bioturbated or poorly laminated deposits of blue-grey to grey-brown silty to very silty clay, clayey silt, and occasional silt, with interbedded layers of sandy clay. Its composition includes thin horizons of carbonate concretions—commonly referred to as cementstone nodules—and scattered pyrite. The unit also features minor beds of shells, fine sand partings, and localized pockets of sand, which tend to increase both at the base and near the top of the succession. Notably, thin beds of black rounded flint gravel occur at the basal level and at discrete intervals. Glauconite appears in several sandy layers and clay beds, while white mica is present at specific stratigraphic levels. Geographically, the London Clay extends across the London Basin, East Anglia, and the Hampshire Basin.	Present across the whole Proposed Installation area.

4.3.2 Hydrogeology

According to the EA Groundwater protection Policy, the Lynch Hill Gravel Member - Sand and Gravel is classed as Principal aquifer and the London Clay Formation is classed as unproductive aquifer.

Mapping provided by the BGS included within the Groundsure Report (Ref: GS-DHH-8CV-593-QJF, dated 19th June 2025) outlines the combined vulnerability of groundwater to pollution and has been classified as high. The Proposed Installation does not lie within a Source Protection Zone (SPZ) and there are no SPZ within 1 km of the site.

According to Groundsure Report (Ref: GS-DHH-8CV-593-QJF, dated 19th June 2025), the Proposed Installation overlies the Lower Thames Gravels groundwater body, which was classified as being ‘poor’ overall quality in 2019.

The closest active groundwater abstraction licence is located approximately 510m to the south and is related to the abstraction of Thames Groundwater (maximum daily volume of 3608m^3)

by Cemex UK Material Limited at their Langley Quarry, Richings Park for the purposes of general washing, process water, mineral washing and dust suppression.

4.3.3 Hydrology

There are numerous surface water features located with the Proposed Installation area. These are presented in Table 4.

Table 4. Surface Water Features

Surface Water Feature	Closest Distance to the Installation Boundary and Direction
Grand Union Canal	137m north at closest point
Horton Brook	Approximately 500m southwest
Unnamed pond	Approximately 200m southwest
Unnamed river	Approximately 450-500m southwest
Unnamed river	Approximately 450-500m southwest
Unnamed ponds	200-250m southwest

5. Point Source Releases to Air

This section provides the relevant screening assessments of point source emissions to air that could arise from operation of the installation. The assessment has been completed in accordance with the EA's Risk Assessments for your environmental permit[1] using the EA' H1 screening tool[3].

The scope of the assessment has covered the following aspects:

- Release point characteristics;
- Air emissions inventory and mass flows;
- Emissions screening for further assessment;
- Photochemical Ozone Creation Potential (POCP);
- Global Warming Potential

5.1 Release Point Characteristics

Point source releases from the generators at 100% load, $O^{O}C$, 5% oxygen (O_2) and dry basis are summarised in the table below.

Table 5. Summary of the Emission Point Characteristics

Parameter	Main Generators	House Generators
No on Site	36	2
Stack Height (m)	25	25
Stack Diameter (m)	0.6	0.6
Efflux Velocity (m/s)	8.97	4.20
Emission Temperature (^{O}C)	434	
Air Flow (m^3/hr)	9129.01	4275.56
NOx (mg/Nm^3)	2678.8	2051.1
CO (mg/Nm^3)	606.6	572.2
Hydrocarbon (as Benzene) (mg/Nm^3)	65.3	96.4
Particulate Matter (mg/Nm^3)	32.1	43.4

5.2 Testing Scenarios

There are 38 stacks and therefore 38 emission points have been input into the H1 tool. The assessment looked at a number of scenarios:

Table 6. Generator Operating Scenarios

Scenario	Operation hours/year/generator	Description
Scenario 1 Biweekly	**13h total** (Biweekly – 26 per annum @ 0.25 h)	Consider all generators per site at 10% load, one at a time. One generator tested at a time – daytime only. Conservatively modelled at 100%.
Scenario 2 Biannual	**8h total** (biannual – 2 per annum @ 4h)	Consider all generators per site, run at 100% load. One generator tested at a time – daytime only.
Scenario 3 Maintenance	**10h total** (over the course of the year)	Consider all generators per site, run at 100% load. One generator tested at a time – daytime only.

Scenario	Operation hours/year/generator	Description
Scenario 4 Emergency Scenario for Power Outage.	**72h total** (single event)	Consider all generators per site, run simultaneously at 100% load.

5.3 Results Testing No1 - Scenario 1

Testing Scenario 1 – all engines will be run for 0.25 hours every two weeks quarter at 10% load. The engines will be run individually to minimise impacts of emissions. The operating mode (% of year) has been adjusted to reflect the operation of all engines. Under scenario No1 each engine operates for 13 hours per year. Therefore, the installation as a whole runs for 494 hours per year. Only one engine will be in operation at a time. The operating mode for each engine has therefore been calculated to be 0.148% of the year.

$$13 * 100 / 8{,}760 = 0.148\ \%$$

Estimated emissions have been screened for significance against appropriate environmental standards for long-term and short-term exposure. Emissions standards are based on statutory air quality limits where available, and upon human health protection Environmental Assessment Levels (EALs) as given in H1 guidance.

Process contributions (PCs) have been calculated using atmospheric dispersion modelling, details of which are given in Application Part 7. Emissions which are lower than 1% of the relevant emissions standard for long-term exposure and lower than 10% of the relevant limit for short-term exposure are screened out as insignificant.

Figure 1 below shows the emissions screening for Scenario 1.

Figure 1. Air Impact Screening Stage 1 for Test Scenario No 1

Air Impact Screening Stage One

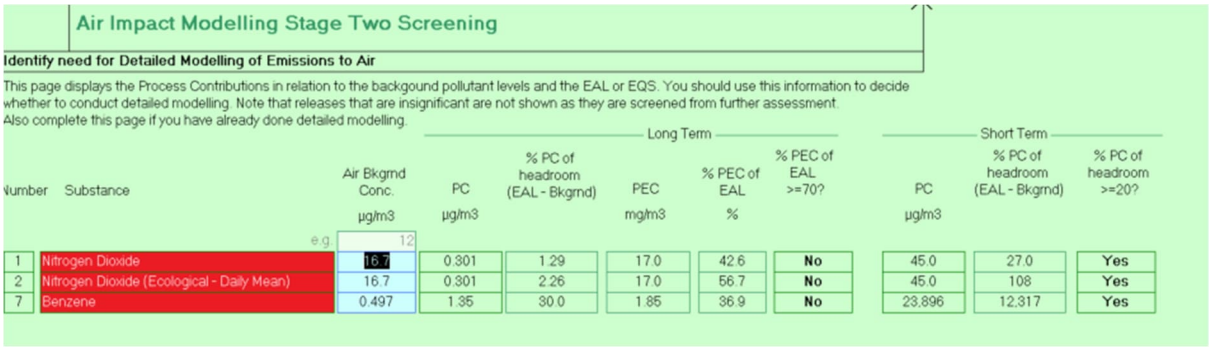
Screen out Insignificant Emissions to Air

This page displays the Process Contribution as a proportion of the EAL or EQS. Emissions with PCs that are less than the criteria indicated may be screened from further assessment as they are likely to have an insignificant impact.

Number	Substance	Long Term EAL	Short Term EAL	Long Term			Short Term		
				PC	% PC of EAL	> 1% of EAL?	PC	% PC of EAL	> 10% of EAL?
		µg/m3	µg/m3	µg/m3	%		µg/m3	%	
1	Nitrogen Dioxide	40.0	200	0.301	0.751	No	45.0	22.6	Yes
2	Nitrogen Dioxide (Ec	30.0	75.0	0.301	1.000	No	45.0	60.0	Yes
3	Carbon monoxide	-	10,000	12.5	-		16.8	0.168	No
4	Particulates (PM10) (	-	50.0	0.1001	-		0.201	0.401	No
5	Particulates (PM10) (	40.0	-	0.1001	0.251	No	11.831	-	
6	Particulates (PM2.5)	25.0	-	0.1001	0.401	No	11.831	-	
7	Benzene	5.00	195	1.35	27.0	Yes	23.896	12.255	Yes

A second stage of screening assesses the predicted environmental concentration (PEC) against emissions limits. Assumed background concentrations are taken from the air quality modelling, details of which are given in Application Part 7. PECs which are lower than 70% of the relevant long-term emissions standard and lower than 20% of the relevant short-term standard minus 2 * the background concentration are screened out as insignificant, as shown in Figure 2 below. Nitrogen dioxide and Hydrocarbon do not screen out as insignificant. Emissions have been further assessed within the air quality assessment.

Figure 2. Air Impact Screening Stage 2 for Test Scenario No 1



Air Impact Modelling Stage Two Screening

Identify need for Detailed Modelling of Emissions to Air

This page displays the Process Contributions in relation to the backgound pollutant levels and the EAL or EQS. You should use this information to decide whether to conduct detailed modelling. Note that releases that are insignificant are not shown as they are screened from further assessment. Also complete this page if you have already done detailed modelling.

Number	Substance	Air Bkgrnd Conc. µg/m3	Long Term PC µg/m3	Long Term % PC of headroom (EAL - Bkgrnd)	Long Term PEC mg/m3	Long Term % PEC of EAL %	Long Term % PEC of EAL >=70?	Short Term PC µg/m3	Short Term % PC of headroom (EAL - Bkgrnd)	Short Term % PC of headroom >=20?
e.g.		12								
1	Nitrogen Dioxide	16.7	0.301	1.29	17.0	42.6	No	45.0	27.0	Yes
2	Nitrogen Dioxide (Ecological - Daily Mean)	16.7	0.301	2.26	17.0	56.7	No	45.0	108	Yes
7	Benzene	0.497	1.35	30.0	1.85	36.9	No	23.896	12.317	Yes

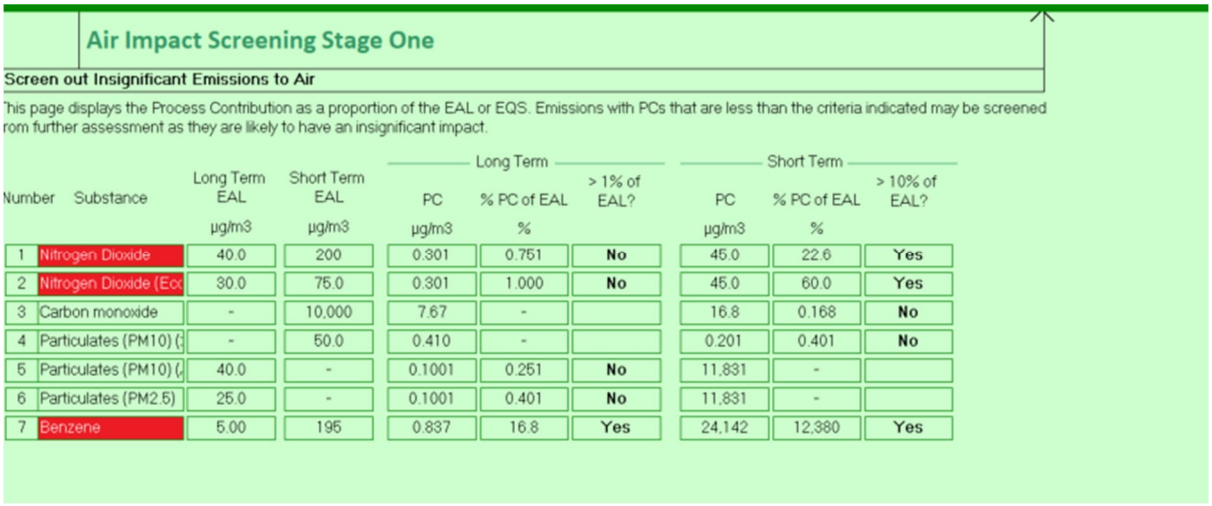
5.4 Results Testing No 2 -Scenario 2

Testing Scenario 2 – all engines will be run for 4 hours twice per year at 100% load. The engines will be run individually to minimise impacts of emissions. Each engine operates for 8 hours per year and therefore the installation as a whole runs for 304 hours per year. Only one engine will be in operation at a time. The operating mode for each engine has therefore been calculated to be 0.0342% of the year.

$$8^* 100 / 8{,}760 = 0.0913\ \%$$

Figure 3 below shows the emissions screening for scenario 2.

Figure 3. Air Impact Screening Stage 1 for Test Scenario No 2



Air Impact Screening Stage One

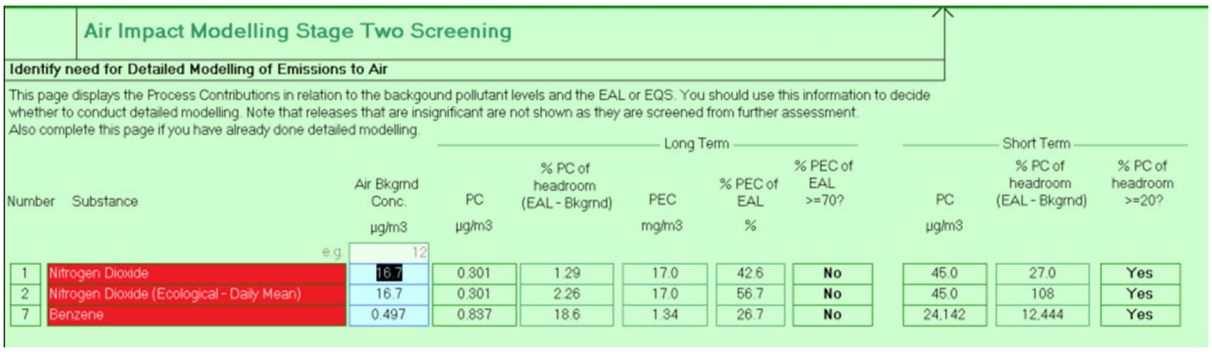
Screen out Insignificant Emissions to Air

This page displays the Process Contribution as a proportion of the EAL or EQS. Emissions with PCs that are less than the criteria indicated may be screened from further assessment as they are likely to have an insignificant impact.

Number	Substance	Long Term EAL µg/m3	Short Term EAL µg/m3	Long Term PC µg/m3	Long Term % PC of EAL %	Long Term > 1% of EAL?	Short Term PC µg/m3	Short Term % PC of EAL %	Short Term > 10% of EAL?
1	Nitrogen Dioxide	40.0	200	0.301	0.751	No	45.0	22.6	Yes
2	Nitrogen Dioxide (Ec	30.0	75.0	0.301	1.000	No	45.0	60.0	Yes
3	Carbon monoxide	-	10,000	7.67	-		16.8	0.168	No
4	Particulates (PM10) (;	-	50.0	0.410	-		0.201	0.401	No
5	Particulates (PM10) (,	40.0	-	0.1001	0.251	No	11.831	-	
6	Particulates (PM2.5)	25.0	-	0.1001	0.401	No	11.831	-	
7	Benzene	5.00	195	0.837	16.8	Yes	24.142	12.380	Yes

A second stage of screening assesses the predicted environmental concentration (PEC) against emissions limits. Assumed background concentrations are taken from the air quality modelling, details of which are given in Application Part 7. PECs which are lower than 70% of the relevant long-term emissions standard and lower than 20% of the relevant short-term standard minus 2 * the background concentration are screened out as insignificant, as shown in Figure 4 below. Nitrogen dioxide and Hydrocarbon do not screen out as insignificant. Emissions have been further assessed within the air quality assessment.

Figure 4. Air Impact Screening Stage 2 for Test Scenario No 2



Air Impact Modelling Stage Two Screening

Identify need for Detailed Modelling of Emissions to Air

This page displays the Process Contributions in relation to the backgound pollutant levels and the EAL or EQS. You should use this information to decide whether to conduct detailed modelling. Note that releases that are insignificant are not shown as they are screened from further assessment.
Also complete this page if you have already done detailed modelling.

Number	Substance	Air Bkgrnd Conc. µg/m3	Long Term PC µg/m3	Long Term % PC of headroom (EAL - Bkgrnd)	Long Term PEC mg/m3	Long Term % PEC of EAL %	Long Term % PEC of EAL >=70?	Short Term PC µg/m3	Short Term % PC of headroom (EAL - Bkgrnd)	Short Term % PC of headroom >=20?
	e.g.	12								
1	Nitrogen Dioxide	16.7	0.301	1.29	17.0	42.6	No	45.0	27.0	Yes
2	Nitrogen Dioxide (Ecological - Daily Mean)	16.7	0.301	2.26	17.0	56.7	No	45.0	108	Yes
7	Benzene	0.497	0.837	18.6	1.34	26.7	No	24,142	12,444	Yes

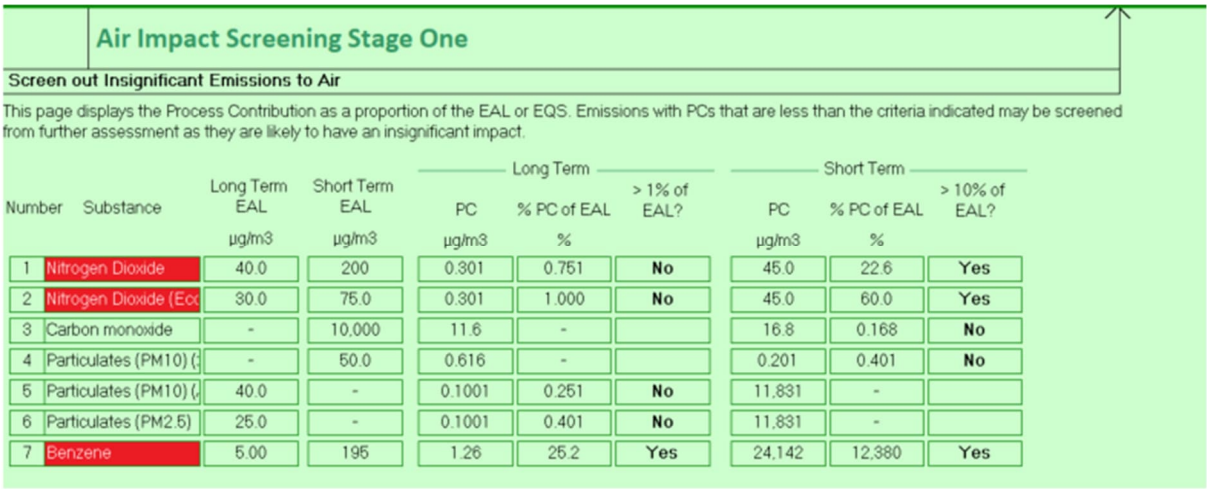
5.5 Results Maintenance - Scenario 3

Maintenance Scenario 3 – all engines will be run for 1 hours each month at 100% load. The engines will be run individually to minimise impacts of emissions. Each engine operates for 10 hours per year and therefore the installation as a whole runs for 456 hours per year. Only one engine will be in operation at a time. The operating mode for each engine has therefore been calculated to be 0.137% of the year.

$$10^* 100 / 8{,}760 = 0.114\%$$

Figure 5 below shows the emissions screening.

Figure 5. Air Impact Screening Stage 1 for Maintenance Scenario No 3



Air Impact Screening Stage One

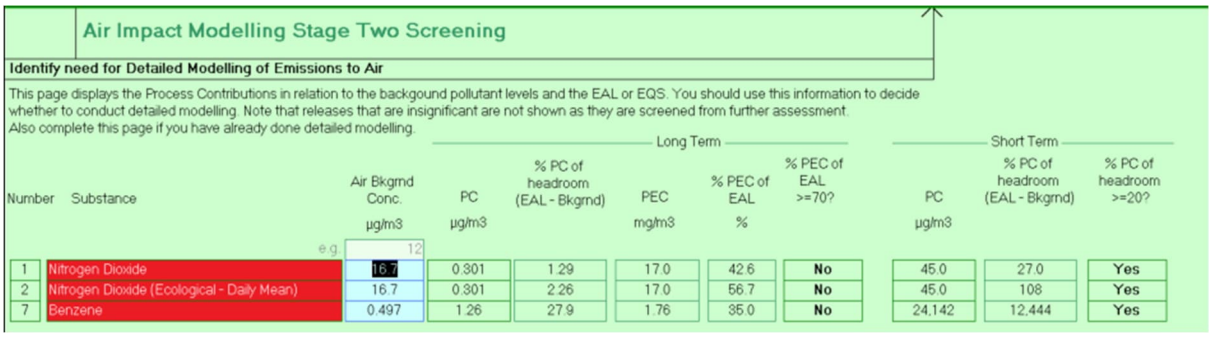
Screen out Insignificant Emissions to Air

This page displays the Process Contribution as a proportion of the EAL or EQS. Emissions with PCs that are less than the criteria indicated may be screened from further assessment as they are likely to have an insignificant impact.

Number	Substance	Long Term EAL µg/m3	Short Term EAL µg/m3	Long Term PC µg/m3	Long Term % PC of EAL %	Long Term > 1% of EAL?	Short Term PC µg/m3	Short Term % PC of EAL %	Short Term > 10% of EAL?
1	Nitrogen Dioxide	40.0	200	0.301	0.751	No	45.0	22.6	Yes
2	Nitrogen Dioxide (Ecc	30.0	75.0	0.301	1.000	No	45.0	60.0	Yes
3	Carbon monoxide	-	10,000	11.6	-		16.8	0.168	No
4	Particulates (PM10) (;	-	50.0	0.616	-		0.201	0.401	No
5	Particulates (PM10) (,	40.0	-	0.1001	0.251	No	11,831	-	
6	Particulates (PM2.5)	25.0	-	0.1001	0.401	No	11,831	-	
7	Benzene	5.00	195	1.26	25.2	Yes	24,142	12,380	Yes

A second stage of screening assesses the predicted environmental concentration (PEC) against emissions limits. Assumed background concentrations are taken from the air quality modelling, details of which are given in Application Part 7. PECs which are lower than 70% of the relevant long-term emissions standard and lower than 20% of the relevant short-term standard minus 2 * the background concentration are screened out as insignificant, as shown in Figure 6 below. Nitrogen dioxide and Hydrocarbon do not screen out as insignificant. Emissions have been further assessed within the air quality assessment.

Figure 6. Air Impact Screening Stage 2 for Maintenance Scenario No 3



Air Impact Modelling Stage Two Screening

Identify need for Detailed Modelling of Emissions to Air

This page displays the Process Contributions in relation to the backgound pollutant levels and the EAL or EQS. You should use this information to decide whether to conduct detailed modelling. Note that releases that are insignificant are not shown as they are screened from further assessment. Also complete this page if you have already done detailed modelling.

Number	Substance	Air Bkgrnd Conc. µg/m3	Long Term PC µg/m3	Long Term % PC of headroom (EAL - Bkgrnd)	Long Term PEC mg/m3	Long Term % PEC of EAL %	Long Term % PEC of EAL >=70?	Short Term PC µg/m3	Short Term % PC of headroom (EAL - Bkgrnd)	Short Term % PC of headroom >=20?
e.g.		12								
1	Nitrogen Dioxide	16.7	0.301	1.29	17.0	42.6	No	45.0	27.0	Yes
2	Nitrogen Dioxide (Ecological - Daily Mean)	16.7	0.301	2.26	17.0	56.7	No	45.0	108	Yes
7	Benzene	0.497	1.26	27.9	1.76	35.0	No	24,142	12,444	Yes

5.6 Results Emergency Operation - Scenario 4

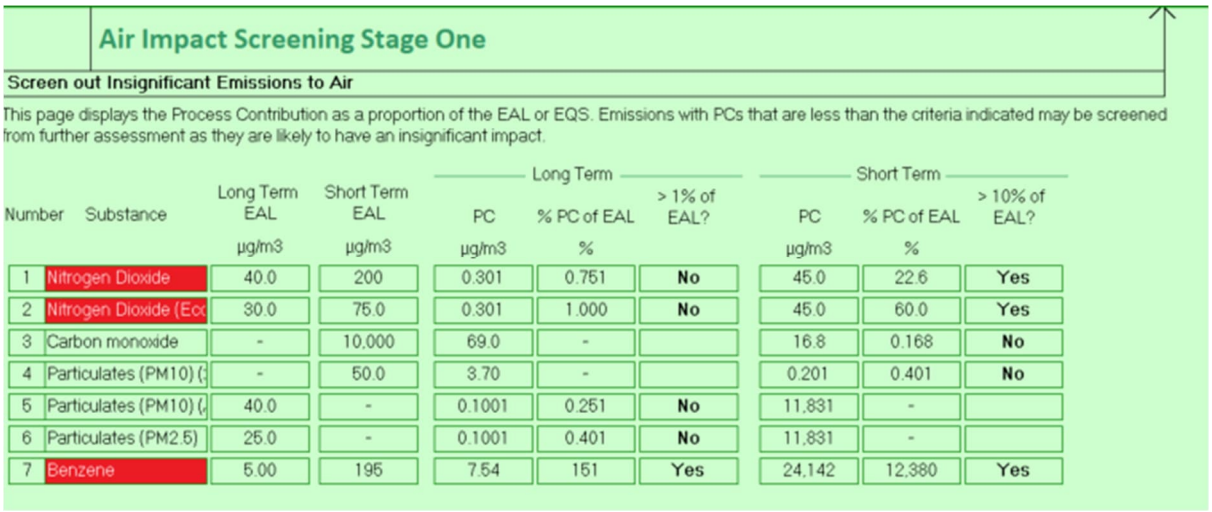
In the emergency Scenario – all engines assumed to run simultaneously for 3 x 24 hours at 100% load. This is an extremely conservative assessment given the redundancy build into the grid connection and the reliability of the connection. Further details of this are provided in the main supporting document (SP3224LP-APP-SS).

Emergency Scenario – all engines will be run simultaneously for 72 per year at 100% load. The installation as a whole runs for 72 hours per year. The operating mode for each engine has therefore been calculated to be 0.822% of the year.

$$72^* 100 / 8{,}760 = 0.822\ \%$$

Figure 7 below shows the emissions screening.

Figure 7. Air Impact Screening Stage 1 for Emergency Scenario No 4



Air Impact Screening Stage One

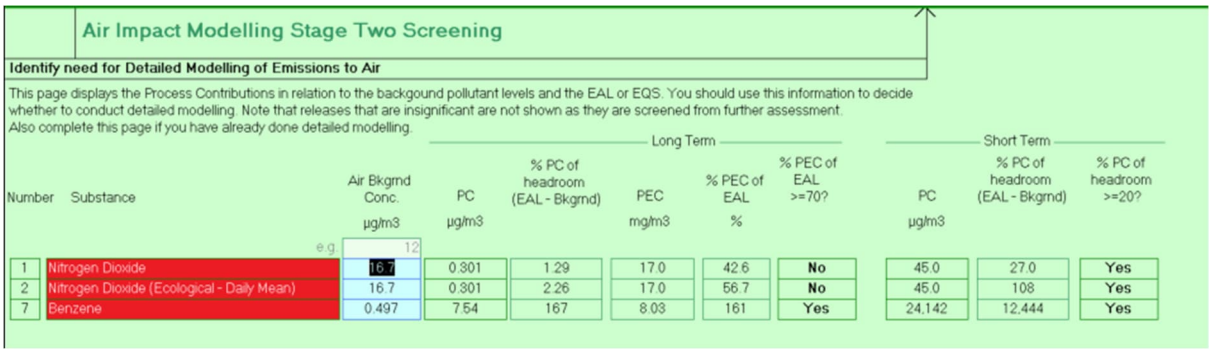
Screen out Insignificant Emissions to Air

This page displays the Process Contribution as a proportion of the EAL or EQS. Emissions with PCs that are less than the criteria indicated may be screened from further assessment as they are likely to have an insignificant impact.

Number	Substance	Long Term EAL µg/m3	Short Term EAL µg/m3	Long Term PC µg/m3	Long Term % PC of EAL %	Long Term > 1% of EAL?	Short Term PC µg/m3	Short Term % PC of EAL %	Short Term > 10% of EAL?
1	Nitrogen Dioxide	40.0	200	0.301	0.751	No	45.0	22.6	Yes
2	Nitrogen Dioxide (Ec	30.0	75.0	0.301	1.000	No	45.0	60.0	Yes
3	Carbon monoxide	-	10,000	69.0	-		16.8	0.168	No
4	Particulates (PM10) (	-	50.0	3.70	-		0.201	0.401	No
5	Particulates (PM10) (	40.0	-	0.1001	0.251	No	11,831	-	
6	Particulates (PM2.5)	25.0	-	0.1001	0.401	No	11,831	-	
7	Benzene	5.00	195	7.54	151	Yes	24,142	12,380	Yes

A second stage of screening assesses the predicted environmental concentration (PEC) against emissions limits. Assumed background concentrations are taken from the air quality modelling, details of which are given in Application Part 7. PECs which are lower than 70% of the relevant long-term emissions standard and lower than 20% of the relevant short-term standard minus 2 * the background concentration are screened out as insignificant, as shown in Figure 8 below. Nitrogen dioxide and Hydrocarbon do not screen out as insignificant. Emissions have been further assessed within the air quality assessment.

Figure 8. Air Impact Screening Stage 2 for Emergency Scenario No 4



Air Impact Modelling Stage Two Screening

Identify need for Detailed Modelling of Emissions to Air

This page displays the Process Contributions in relation to the backgound pollutant levels and the EAL or EQS. You should use this information to decide whether to conduct detailed modelling. Note that releases that are insignificant are not shown as they are screened from further assessment.
Also complete this page if you have already done detailed modelling.

			Long Term					Short Term		
Number	Substance	Air Bkgrnd Conc. µg/m3	PC µg/m3	% PC of headroom (EAL - Bkgrnd)	PEC mg/m3	% PEC of EAL %	% PEC of EAL >=70?	PC µg/m3	% PC of headroom (EAL - Bkgrnd)	% PC of headroom >=20?
e.g.		12								
1	Nitrogen Dioxide	16.7	0.301	1.29	17.0	42.6	No	45.0	27.0	Yes
2	Nitrogen Dioxide (Ecological - Daily Mean)	16.7	0.301	2.26	17.0	56.7	No	45.0	108	Yes
7	Benzene	0.497	7.54	167	8.03	161	Yes	24,142	12,444	Yes

5.7 Photochemical Ozone Creation Potential

The photochemical ozone creation potential (POCP) has been calculated in accordance with the H1 guidance[3]. NO_2, CO, and benzene emissions from the installation contribute to photochemical ozone creation. The associated POCP for each scenario are shown within Table 7.

Table 7. Photochemical Ozone Creation Potential

Scenario	POCP
Scenario 1 - Testing No 1	45.92
Scenario 2 - Testing No 2	32.30
Scenario 3 - Maintenance	42.69
Scenario 4 - Emergency	255.74
Total All Scenarios	**376.65**

As can be seen from Table 7 above the majority of the POCP is created from the emergency scenario. As described above and in detail in the supporting information document this scenario is very conservative and unlikely to occur. The redundancy built into the grid connection and the reliability of the grid mean that it is highly unlikely that the installation would be required for the length of time modelled in the assessment. The installation will comply with emission limits set out in draft EA guidance titled “Data Centre FAQ Headline Approach”[4] which refers to the US EPA Tier 2 Standard, and the supporting information document details an assessment of the techniques employed at the installation and concludes that the proposed measures are BAT.

5.8 Global Warming Potential

The global warming potential (GWP) has been calculated assuming that all scenarios are run in any one year. This is a very conservative approach as the likelihood of the engines being required for emergency backup for 72 hours per year is very low. The GWP effects set out below are accordingly likely to be overestimated. Information regarding grid reliability and other resilience measures in pace at the data centre are described within the permit application supporting information document.

The assessment was completed on a worst case basis of using diesel as the fuel. However, the intention is to move to HVO as soon as practicable which has a lower GWP potential. The latest DEFRA CO_2 factors for diesel and for HVO have been used within the H1 software.

The total GWP score calculated on this basis for each fuel type is presented in Table 8 below.

[4] Environment Agency, “Data Centre FAQ Headline Approach”, Version 21.0, Issued to TechUK for Discussion 15/11/22

Table 8. Global Warming Potential

Scenario	GWP	GWP - HVO
Scenario 1 - Testing No 1	943	14
Scenario 2 - Testing No 2	580	8
Scenario 3 - Maintenance	725	11
Scenario 4 - Emergency	5,222	76
Total All Scenarios	**7,470**	**109**

6. Qualitative Risk Assessment

The risk assessments have been completed by considering each of the risks identified in section 3 above in terms of:

- Frequency of occurrence;
- Nature and quantity of substance released;
- Pathways and receptors involved;
- Environmental consequence(s) of the event;
- Overall risk and its significance to the environment; and
- Control and mitigation measures needed to prevent or reduce the risk.

6.1 Methodology

The risk assessment methodology has been developed using a scoring mechanism, whereby scores are assigned to:

- The probability of hazard occurring without the use of protective measures;
- The consequences of the hazard to the environment or human health; and
- The effectiveness of the control/mitigation used to prevent the hazard occurring.

The scoring system used for the assessment is shown in Table 9 below.

Table 9. Risk Assessment Scoring System

Probability of Exposure	
Frequency	**Comment**
Unlikely	Incident occurs once every 10+ years or for climate risk it is improbable the event would occur even in the long term.
Low Unlikely	Incident occurs once every 1 to 10 years or for climate risk circumstances are such that an event could occur, but it is not certain even in the in the long term that an event would occur, and it is less likely in the short term.
Likely	Incident occurs at least once per year or for climate risk circumstances are such that an event could occur, but it is not certain even in the in the long term that an event would occur, and it is less likely in the short term.
Highly Unlikely	Incident occurs at least once per month or for climate risk it is probable but not inevitable that an event will occur in the long term.
	Consequence of Hazard to Environment or to Human Health
Consequence	**Comment**
Minor	Onsite nuisance only no outside complaint No breach of permit Short or long-term climate impact to operations resulting in additional measures for compliance.
Mild	Nuisance noticeable off-site with potential for 1 – 2 complaints Reportable breach of permit Minor plant damage or Health and safety ‘near miss’ Short-term, acute climate impact to operations resulting in single temporary compliance breach.
Medium	Severe sustained nuisance or Significant plant damage Injury requiring on-site medical treatment Major breach of environmental permit Numerous public complaints

	Regulator involved Short-term, acute climate impact to operations resulting in multiple temporary compliance breaches.
Severe	Hospital treatment required for injured persons Site evacuation required (partial or full) Partial plant shutdown required Replacement of part of plant Widespread but temporary damage to land Hazardous substance release to water course, land or air with widespread but temporary on people or the environment Off-site emergency services involved Regulatory prosecution likely Public warning and off-site emergency plan implemented Short-term, acute climate impact to operations resulting in permanent compliance breaches.

The impacts are scored using the scoring matrix above and the risk is then scored using the risk scoring matrix (Table 10 below) by:

Risk = Probability x Consequence

Table 10. Risk Scoring Matrix

		Severity			
		Severe Impact	**Medium Impact**	**Mild Impact**	**Minor Impact**
Likelihood	**High Likely**	High	Medium	Low	Low
	Likely	Medium	Medium	Low	Insignificant
	Low Likelihood	Low	Low	Low	Insignificant
	Unlikely	Low	Insignificant	Insignificant	Insignificant

Residual risk is determined by the same method and residual risk category applied

6.2 Risk Reduction and Management

With respect to risk reduction and management, the Operator will:

- Ensure that as the design of the facility is developed, that risk reduction is embedded where practicable to ensure BAT standards are met;
- Ensure where a risk can't be avoided appropriate controls and mitigations are employed during plant operation. These will be supported by site operating procedures and management plans as appropriate;
- Undertake regular site inspections to assess odour, noise, fugitive emissions, housekeeping and security; corrective action will be undertaken as necessary;
- Keep an up-to-date record of all accidents, incidents, near misses, changes to procedures, abnormal events, and the findings of maintenance inspections;
- Investigate accidents, incidents, near misses and abnormal events and recording actions taken to prevent a reoccurrence;
- Maintaining an inventory of substances, which are present (or likely to be) and which could have environmental consequences if they escape;

- Routine inspections and maintenance will take place on bunded and impermeable surfacing where there is a potential for accidents to occur due to loss of containment. The operator shall ensure procedures are in place to implement any necessary remedial measures; and

- Develop an emergency and business continuity plan which will include dealing with environmental incidents and cover site plans and information for emergency services.

6.3 Risk Assessments

The risk assessments for the site are presented as follows:

- Section 6.3.1 Amenity Risks
- Section 6.3.2 Visible Plumes
- Section 6.3.3 Abnormal Operations and Accidents
- Section 6.3.4 Fire Risk
- Section 6.3.5 Climate Risk

Each risk assessment is completed for each risk identified in Section 3 above, scores applied in line with the scoring methodology (section 6.1) and the relevant mitigations and controls identified.

6.3.1 Amenity Risks

Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	Overall Risk
Fugitive Releases To Air						
Combustion Emissions (NOx, CO, PM, hydrocarbons) from operation of the generators during testing, maintenance or emergency operation.	• Local residents / businesses beyond the Installation boundary. • Ecological receptors beyond the Installation boundary. • Local air quality and contribution to climate change via Global Warming Potential (Carbon dioxide (CO_2) is the main greenhouse gas emitted during diesel combustion and is directly responsible for global warming.	Atmospheric dispersion from generator stacks	• Stack dispersion modelling • Combustion on engines will be optimised • Generators will be subject to routine maintenance in line with the manufacturer's recommendations. • Limited operation hours	Probability of exposure is low due to infrequent emissions, short duration and modelled to meet AQALs.	Low risk of air pollution impacts on human health and ecological receptors.	Low
Windblown dust and particulates from external roads, pathways and other surfaces.	• Local residents/ businesses beyond the installation boundary. • Local air quality	Dust carried on wind leading to the development of flammable atmospheres.	• No specific dust generating activities on the site. • A hard surfaced access road will be provided from the installation entrance. • Road and site surfacing will be subject to routine inspection and maintenance – any accumulation of materials will be removed promptly. • Speed restrictions of 10mph will be imposed for all vehicles driving on the site, in order to minimise emissions of dust from internal road surfaces • The Operator will implement a Complaints Management procedure which will record the complaint along with the results of any investigation and any corrective action taken.	• Probability of exposure is considered to be very low by application of appropriate management procedures which will be developed prior to the commencement of operation of the installation.	Unlikely nuisance issue.	Insignificant
Fumes during the delivery and storage of diesel on site.	• Local residents/ businesses beyond the installation boundary.	Vapours carried on wind.	• All tanks, pipes and valves will be designed to appropriate industry standards. • Flanged connections between pipes will be kept to a minimum between storage tanks and the tanker fill point and between the generator farms. • All tanks, silos, pipes and valves will have a preventative maintenance programme to ensure ongoing integrity and effectiveness. • Fuel tank filing will be carried out by trained fuel tanker drivers. • The diesel tanks will be fitted with vents in line with industry standards and these will only allow minimal potential for fumes to escape. • No other oils will only be stored on site. Lubricating oil is present within the generators closed loop system with no emissions. Lubricants will only be brought to site at the time of maintenance.	• Low probability due to the design of fuel storage systems, management and maintenance systems on site	Low level of negative impact on human and ecological receptors.	Low
Escape of odour.	• Local residents/ businesses beyond the installation boundary.	Vapours/ odour carried on wind.	• There will be no significant sources of odour at the Proposed Installation. Fuel storage tanks will be vented but odour emissions are not anticipated to be significant. • Belly tanks will be vented but will be situated within the engine containers thus reducing the risk of odour nuisance. • Site will have sufficient spillage control equipment. • Any fugitive emissions from leaks or spills are expected to be mostly related to maintenance activities. These will be	• Probability of exposure is considered to be very low as the installation is not anticipated to have any notable source of odour.	Negligible risk of complaints of odours/ smells in vicinity of local receptors.	Insignificant

Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	Overall Risk
			managed and controlled in line with established procedures to minimise the risk of occurrence. • The Operator will implement a Complaints Management procedure which will record the complaint along with the results of any investigation and any corrective action taken. • Monitoring and appropriate maintenance schedule to prevent the release of odorous vapours or materials.			
Fugitive Releases to Land or Water						
Spillage of waste or other materials during maintenance activities.	Local surface water and/ or groundwater.	• Flow by gravity through drainage systems or unsurfaced areas. • Cracked drains/ hardstanding leading to soil and groundwater.	• Regular operator checks for signs of leaks and repairs are dealt with promptly if identified. • High standards of housekeeping are maintained across the site. • Spill kits are available to deal with any leaks. • Suitable waste storage receptacles will be provided during maintenance and will be secure and clearly labelled. All waste generated during maintenance will be removed on completion of maintenance tasks. • Operator will ensure procedures are in place to implement any necessary remedial measures. • The area within the installation boundary is gravity drained via Class 1 full interceptors before entering the foul sewer. The interceptors are monitored via the Business Management System (BMS) and alarms are present for detection of hydrocarbon. Interceptors will have at least a 10,000 litre capacity which is a greater capacity than 1 tanker compartment.	• Fugitive releases cannot reach surface water and/ or groundwater as drainage is directed to foul sewer.. Appropriate design of the foul sewer arrangements including drainage from Installation Boundary passing through Class 1, full interceptors which are monitored and alarmed for presence of hydrocarbons. Site will have drainage systems which align with the UK Building Regulations, National Planning Policy Framework (NPPF), Sewerage Sector Guidance (SSG) Appendix C. . Probability is therefore unlikely.	There would be a negligible risk of localised minor pollution of surface water and groundwater.	Insignificant
Leaks during the delivery and storage of diesel on site.	Local surface water and/ or groundwater. Underlying land strata	• Flow by gravity through drainage systems/ and unsurfaced areas. • Cracked drains/ hardstanding leading to soil and groundwater.	• Site surfacing for all areas accessed by vehicles will be concrete designed to an appropriate standard. • All tanks, pipes and valves will be designed to appropriate industry standards and in compliance with the Oil Storage Regulations. • Flanged connections between pipes will be kept to a minimum between storage tanks and the tanker fill point and between the generator farms. • Fuel pipelines will have a pipe-in-pipe arrangement with leak detection to minimise risk of leaks. • Routing of pipework above ground so that leaks would be visible. • Use of materials with anti-corrosive properties for pipework to minimize leaks. All tanks, silos, pipes and valves will have a preventative maintenance programme to ensure ongoing integrity and effectiveness. • Fuel tank filing will be carried out by trained fuel tanker drivers. • Tanks will be equipped with level alarms, overfill protection and leak detection. Storage tanks and generator belly tanks will be integrally bunded to 110%. • Engineered site drainage system which will direct run off from generator, fuel storage and unloading areas to the foul sewer via a Class 1 fuel interceptor. • Fuel containment and oil separators are monitored and alarm fitted which will signal on the BMS if hydrocarbons are detected.	• Fugitive releases cannot reach surface water and/ or groundwater as drainage is directed to foul sewer.. Appropriate design of the foul sewer arrangements including drainage from Installation Boundary passing through Class 1, full interceptors which are monitored and alarmed for presence of hydrocarbons.	There would be a negligible risk of localised minor pollution of surface water and groundwater.	Insignificant

Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	Overall Risk
			• Drainage system subject to routine inspection along with a preventative maintenance regime. • The operator will complete daily checks for signs of leakage. All spillages/leaks will be logged, investigated and appropriate corrective action undertaken. • High standards of housekeeping are maintained across the site. • Spill kits are available to deal with any leaks.			
Nuisance Issues						
Mud/litter	• Local residents / businesses beyond the Installation boundary. • Local surface water	• Windblown litter material • Flow by gravity through drainage systems or unsurfaced areas	• All internal roads, storage and processing areas are hard surfaced with concrete or tarmac. • High standards of housekeeping are maintained across the site. • Suitable waste storage receptacles will be provided during maintenance and will be secure and clearly labelled. All waste generated during maintenance will be removed on completion of maintenance tasks.	• Low risk of litter reach surface water or being carried beyond site boundaries, due to low volume of waste generation on site, and appropriate management controls. • Given the surfacing on site and plant operations, the likelihood of mud is negligible	Unlikely that material will be carried beyond the site or results in complaints from local receptors.	Insignificant
Pest, vermin and scavengers	• Local residents / businesses beyond the Installation boundary. • Local surface water and/ or groundwater.	• Land • Water	• Unlikely to be a risk for the operations however, use of registered pest control contractors and rodenticide will be considered if required.	• Unlikely to occur given the nature of the proposed operations	Unlikely that a pest/vermin infestation would occur on site or would impact local sensitive receptors.	Insignificant
Noise from vehicle movement on site	• Local residents / businesses beyond the Installation boundary.	• Air	• Reversing will be minimised where possible • Engines are switched off when not in use. • Speed limit is restricted 10 mph onsite, signages will be provided within the site area. • Vehicles will arrive/depart from the site in accordance with the normal operating hours. • Apart from staff working at the adjacent data centres, vehicle movements will be limited to deliveries of fuel which will be infrequent. • The Operator will implement a Complaints Management procedure which will record the complaint along with the results of any investigation and any corrective action taken.	• Low potential for impact from delivery vehicles.	Low level of noise impact beyond site boundary and complaints from local receptors.	Low
Noise from generators	Local residents / businesses beyond the Installation boundary.	• Air	• Staff training includes raising employee awareness with respect to normal plant operational noise levels and actions to be taken to rectify any faults. • Generators will operate during maintenance/testing scenarios and for emergency backup operation. Operating hours will not exceed 500 hours per annum and in reality will be significantly less than this. Site plant will be maintained in line with manufacturer's recommendations this includes checking for deterioration of plant condition (e.g. bearings becoming worn). Repairs will be undertaken as appropriate to rectify any identified defects. • The Operator will implement a Complaints Management procedure which will record the complaint along with the	• Testing is periodic and mitigated by enclosures and testing schedules, therefore probability of exposure is low. • The emergency scenario has a very low probability given the National Grid reliability, the in-built redundancy and infrastructure maintenance systems	• Potential for noise beyond site boundary and complaints from local receptors for testing and maintenance is considered unlikely • Potential for noise impact beyond the site boundary during emergency backup is considered medium – high.	Insignificant for testing and maintenance Low for emergency scenario due to very low probability of it occurring

Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	Overall Risk
			results of any investigation and any corrective action taken. • A detailed Noise Impact Assessment has been completed and is presented in Section 9 of the application. • Noise from the generators has been mitigated and reduced to a minimum by locating the generators in acoustic enclosures. These enclosures are a higher-performance specification than the applicant typically uses. Notwithstanding this, in the event of a major grid failure resulting in the operation of all generators simultaneously the noise impact would be considered significant at HR1 and HR2. However, due to rare nature of the emergency scenario, National Grid reliability and the in-built redundancy and infrastructure maintenance systems; this is unlikely to occur in practice and/or for any length of time and should therefore be considered acceptable.			
Vibration from the operation of the generators	Local residents / businesses beyond the Installation boundary.	• Land	• Significant vibration effects are not anticipated for the installation. • The Operator will implement a Complaints Management procedure which will record the complaint along with the results of any investigation and any corrective action taken.	Unlikely there will be any vibration impacts from the operation of the generators	Low	Insignificant

6.3.2 Visible Plumes

Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	Overall Risk
Plumes from the operation of the generators	• Local residents / businesses beyond the Installation boundary.. • Ecological receptors beyond the Installation boundary.	Dispersion by wind	• Plant will be maintained in line with manufacturer's recommendations. • Combustion on engines will be optimised and visible should therefore not occur during normal operation. • Visual checks for emissions during generator start-up – in the event that a visible emission is noted, the generator will be stopped, emission investigated and repairs completed where appropriate before generator is restarted. • Limited operation hours	Probability of exposure is very low due to infrequent operation run times of short duration and generator maintenance.	Low chance of visual intrusion	Low

6.3.3 Accident and Abnormal Operations Risk Assessment

Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	Overall Risk
Transfer of substances during maintenance resulting in spillage.	• Local surface water and/ or groundwater.	• Flow by gravity through foul drainage systems or unsurfaced areas. • Cracked drains/ hardstanding leading to soil and groundwater.	• Spill kits are available to deal with any leaks. • Suitable waste storage receptacles will be provided during maintenance and will be secure and clearly labelled. All waste generated during maintenance will be removed on completion of maintenance tasks. • Operator will ensure procedures are in place to implement any necessary remedial measures. • The area within the installation boundary is gravity drained via Class 1 full interceptors before entering the foul sewer. The interceptors are monitored via the Business Management System (BMS) and alarms are present for detection of hydrocarbon. Interceptors will have at least a 10,000 litre capacity which is a greater capacity than 1 tanker compartment.	• Fugitive releases cannot reach surface water and/ or groundwater as drainage is directed to foul sewer.. Appropriate design of the foul sewer arrangements including drainage from Installation Boundary passing through Class 1, full interceptors which are monitored and alarmed for presence of hydrocarbons. • Appropriate design and management control during maintenance should prevent this from happening. Probability is therefore unlikely.	There would be negligible risk of localised minor pollution of surface water and groundwater.	Insignificant
Fuel Tanks overfill	• Staff • Surface or groundwater or land	• Air, Water or Land	• Tank design is in accordance with appropriate design, fabrication and safety standards • Tanks fitted will be with overfill protection, trips and alarms on level (high level and critical high level) that will cause filling operation into tank to be automatically stopped • There will be a delivery procedure in place with checks which will ensure that the receiving tank has sufficient capacity to accept the load • Systems will be subject to routine planned preventative maintenance and inspections in line with manufacturer's recommendations. • Emergency procedures will be in place which staff are trained to implement, • Emergency spill kits will be provided at site to contain and address any spillage. • Site foul drainage will be checked for signs of ingress and if necessary, interceptor will be isolated, and material removed by suction plant for offsite disposal. • Total site inventory limited to lowest practicable volumes to run the plant safely and efficiently. • Secondary containment to 110% of single tank volume will be provided. • Minimum flanged connections on storage system • Fuel tank filing will be carried out by trained fuel tanker drivers. • Tank will be equipped with level alarms and leak detection. • Storage tanks and generator belly tanks will be integrally bunded to 110%. • Engineered site foul drainage system which will direct run off from generator, fuel storage and unloading areas to the foul sewer via a Class 1 fuel interceptor which is monitored via the BMS and will alarm on detection of hydrocarbon. • Interceptors will automatically close Interceptors will have at least a 10,000 litre capacity which is a greater capacity than 1 tanker compartment.	• Low probability of tank overfill due to the design of fuel storage systems, management and maintenance systems on site • Releases cannot reach surface water and/ or groundwater as drainage is directed to foul sewer.. Appropriate design of the foul sewer arrangements including drainage from Installation Boundary passing through Class 1, full interceptors which are monitored and alarmed for presence of hydrocarbons.	There would be negligible risk of localised pollution of land, surface water and groundwater	Insignificant
Security breach and vandalism	• Local residents/ businesses beyond the installation boundary, air, land and water. • On-site personnel	• Emissions resulting from failure/ reduced performance of vandalised plant, equipment and infrastructure.	• The Proposed Installation is located in a central area of the main data centre site. The data centre site will be secured with a perimeter fence and lockable gates. • Security office will be staffed 24 hours per day. • Access will be through a secure site entrance. • CCTV cameras to be located at numerous locations on Site boundary, this will alert security office to dispatch.	• Appropriate design of security arrangements and management controls will mean there it is unlikely that a site security breach would occur and the Proposed Installation be at risk of damage or vandalism.	There would be a negligible risk of localised pollution of land, surface water and groundwater in the event of vandalism.	Insignificant

Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	Overall Risk
				• In addition releases of fuel cannot reach surface water and/ or groundwater as drainage is directed to foul sewer.. Appropriate design of the foul sewer arrangements including drainage from Installation Boundary passing through a Class 1, full interceptors which are monitored and alarmed for presence of hydrocarbons.		
Containment Failure	• Local residents/ businesses beyond the installation boundary, air, land and water. • On-site personnel	• Air • Water • Land	• Containment designed to the appropriate volume and standards • Operator will carry out routine plant checks. Containment will have routine inspections and maintenance. • Installation boundary is served by Engineered site foul drainage system which in the event of a security breach resulting in a release of fuels will direct run off from to the foul sewer via a Class 1 fuel interceptor which is monitored via the BMS and will alarm on detection of hydrocarbon. • Interceptors will automatically close Interceptors will have at least a 10,000 litre capacity which is a greater capacity than 1 tanker compartment.	• Appropriate design of fuel storage and associated containment equipped with monitoring and leak alarms coupled with management controls will mean there is a very low probability of a containment breach. • Releases cannot reach surface water and/ or groundwater as drainage is directed to foul sewer.. Appropriate design of the foul sewer arrangements including drainage from Installation Boundary passing through Class 1, full interceptors which are monitored and alarmed for presence of hydrocarbons.	There would be a negligible risk of localised pollution of land, surface water and groundwater.	Insignificant
Tank Rupture	• Local surface water, soils and/ or groundwater; local ecological receptors.	• Air • Water • Land	• Tank design in accordance with appropriate design, fabrication and safety standards for the material being contained • Vents on tanks are designed to minimise back-pressure problems • If tank has excessive risk of overpressure then will be fitted with appropriate relief device • Routine inspection and maintenance of tanks • Tanks will be located away from vehicle manoeuvring areas and dedicated fill point installed. • Emergency procedures will be in place which staff are trained to implement . • Emergency spill kits will be provided at site to contain and address any spillage. • Site drainage will be checked for signs of ingress through interceptor monitoring and alarms and if necessary, interceptor will be isolated, and material removed for offsite disposal by an appropriately licenced contractor. • Total site inventory limited to lowest practicable volumes to run the plant safely and efficiently. • Installation boundary is served by Engineered site foul drainage system which in the event of a security breach resulting in a release of fuels will direct run off from to the foul sewer via a Class 1 fuel interceptor which is monitored via the BMS and will alarm on detection of hydrocarbon. • Interceptors will automatically close Interceptors will have at least a 10,000 litre capacity which is a greater capacity than 1 tanker compartment.	• Appropriate design of fuel storage and associated containment coupled with management controls will mean there is a very low probability of a tank rupture. • Releases cannot reach surface water and/ or groundwater as drainage is directed to foul sewer.. Appropriate design of the foul sewer arrangements including drainage from Installation Boundary passing through Class 1, full interceptors which are monitored and alarmed for presence of hydrocarbons.	There would be a negligible risk of localised pollution of land, surface water and groundwater.	Insignificant
Plant and equipment failure	• Local residents/ businesses beyond the installation boundary, air, land and water. • On-site personnel when visiting the site and infrastructure.	• Emissions resulting from failure/ reduced performance of plant, equipment and infrastructure.	• Plant/equipment is designed in accordance with relevant design and fabrication standards. • Preventative maintenance includes regulator inspection and maintenance regimes.	• Robust planned preventative maintenance plan reduces the likelihood to low.	There would be a negligible risk of localised pollution of land, surface water and groundwater.	Low

Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	Overall Risk
Flooding of the Site.	Local surface water, soils and/ or groundwater; local ecological receptors.	• Flow by gravity/ drainage systems/ unsurfaced areas. • Overland flow	• The EA flood map for planning shows that the entire site is located in Flood Zone 1 for rivers Surface water drainage design for the wider data centre includes consideration of potential flooding events. • A site induction would also be given to all site operatives and workforce, including outlining evacuation routes, safe refuge, and access and egress areas.	• Appropriate design and management controls used to minimise the risk of site flooding to a low level.	Potential for a low negative impact in the event that flooding occurs.	Low
Major vehicle accident.	• Local residents/ businesses beyond the installation boundary, air, land and water. • On-site personnel when visiting the site and infrastructure.	• Direct impact • Vapour release to air • Release of vehicle lubricants ground or to drains	• Site speed restrictions in place and internal road layout designed to accommodate the vehicles visiting the facility (e.g. tankers) to minimise the risk of vehicle conflicts. • Trained hauliers will deliver fuels and raw materials. • Use of mobile phones prohibited during driving. • Material clean-up arrangements in place. • Road vehicles are robust and designed to withstand high speed collisions that may occur on public highways. • Suitable barriers in place to prevent moving vehicles damaging static equipment and pipework • Drainage system maintained to minimise risk of standing water on road surfaces.	• Appropriate design of plant layout and vehicle movements coupled with experienced drivers makes the likelihood of this occurring Low • Releases cannot reach surface water and/ or groundwater as drainage is directed to foul sewer.. Appropriate design of the foul sewer arrangements including drainage from Installation Boundary passing through Class 1, full interceptors which are monitored and alarmed for presence of hydrocarbons.	Negligible adverse impact due to localised pollution of land, surface water and groundwater.	Low
Making the wrong connections in drains or other systems.	Local surface water and/ or groundwater.	• Flow by gravity through drainage systems or unsurfaced areas. • Cracked drains/ hardstanding leading to soil and groundwater.	• Drainage design undertaken by suitably qualified engineers • Drainage design has been completed using appropriate modelling software • Construction of drainage undertaken in accordance with the specified designs	• Use of competent drainage designers and contractors will reduce the risk to a low level	Negligible negative impact due to localised pollution of surface water and groundwater.	Low
Failure of main services.	None	• N/A	The function of the backup generators is to provide power to the wider site in the event of a grid outage.	N/A	N/A	N/A
Operator error.	• Local residents/ businesses beyond the installation boundary, air, land and water. • On-site personnel when visiting the site and infrastructure.	• Air, Water or Land dependent on the nature of the error.	• All staff will have the appropriate experience and qualifications to undertake their allocated role on site. • Provision of appropriate operator training. • Internal operational control procedures. • Strict compliance with site integrated management system • Generators will be automatically controlled via an automatic control system that incorporates alarms and warning systems to alert operators to potential issues. • Main manual task will be the connection of the tanker to the storage tank refuelling system – this will be completed in a contained area by trained operators.	• Use of automated control systems, suitably experienced and qualified staff and implementation of defined management controls will reduce probability of operator error to a low level. • Releases cannot reach surface water and/ or groundwater as drainage is directed to foul sewer.. Appropriate design of the foul sewer arrangements including drainage from Installation Boundary passing through Class 1, full interceptors which are monitored and alarmed for presence of hydrocarbons.	Negligible adverse impact due to localised pollution of land, surface water and groundwater depending on the nature of the error.	Low

6.3.4 Fire Risk

Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	Overall Risk
Ignition of diesel vapours from leaks or spills near generators or electrical components.	• Local residents/ businesses and other installations beyond the installation boundary. • On-site personnel. • Potential for direct harm to the environment from thermal radiation such as impact on flora and fauna near to Site. • Also, harm to the environment via release of contaminated firewater and smoke to environmental receptors including the London Green Belt in the site surrounding.	• Emissions of smoke to the air. • Firewater, foam, etc. to site drainage soil. • Firewater, foam, etc. to groundwater and/ or controlled waters.	• Design of site to minimise the risk of ignition due to leaks or spills. • Contained site storage of liquid fuels, pipelines and containment designed in accordance with oil storage regulations • Appropriate fire detection and protection systems for the fuel chosen – these will be confirmed following detailed design. • 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 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. • Fire management procedures will be set out in the Accident Management Plan (AMP). • Fire procedures will be kept onsite within the site office and copies will also be provided to the FRS and maintenance contractor. • It is unlikely that firefighting using water/foam would be used to tackle a fire at the installation. Should a fire occur in one of the engines then the likely approach would be to stop the fuel feed and allow the fire to burn out residual fuel. • Should any water be used it would naturally flow into the adjoining drainage system which leads to foul sewer via Class 1 interceptors. Each generator yard has two interceptors and each interceptor has at least a 10,000l capacity and is equipped with automatic shutoff valves. Each interceptor would be isolated int the event of a fire to prevent any fire water entering the foul sewer system before testing. • Fire waters would be removed via an appropriately licensed waste contractor if discharge to sewer was not permitted.	• Appropriate design, management, monitoring and maintenance controls should reduce the risk of Fire to a low level • Releases of firewater cannot reach surface water and/ or groundwater as drainage is directed to foul sewer.. Appropriate design of the foul sewer arrangements including drainage from Installation Boundary passing through Class 1, full interceptors which are monitored and alarmed for presence of hydrocarbons.	• Negligible adverse impact from smoke and localised pollution to surface and/or groundwater.	Insignificant
Arson and vandalism	• Local residents/ businesses beyond the installation boundary, air, land and water. • On-site personnel when visiting the site and infrastructure. • Fuel users who will be using a fuelling infrastructure.	Emissions resulting from failure/ reduced performance of vandalised plant, equipment and infrastructure.	• The site will be secured with a perimeter fence and lockable gates. • Security office will be staffed 24 hours per day. • Access will be through a secure site entrance. • CCTV cameras to be located at numerous locations on Site boundary.	• Appropriate design of security arrangements and management controls will mean there is low probability of a security breach. • Releases firewater cannot reach surface water and/ or groundwater as drainage is directed to foul sewer.. Appropriate design of the foul sewer arrangements including drainage from Installation Boundary passing through Class 1, full interceptors which are monitored and alarmed for presence of hydrocarbons.	There would be a negligible risk of localised pollution of land, surface water and groundwater in the event of vandalism or arson.	Low
Electrical faults	• Local residents/ businesses beyond the installation boundary, air, land and water. • On-site personnel when visiting the site and infrastructure.	• Smoke release to air • Release of fire waters to drains	• Plant/equipment is designed in accordance with relevant design and fabrication standards. • Preventative maintenance includes regulator inspection and maintenance regimes. • Portable appliances subject to PAT testing at least annually; • Fixed wiring systems are installed and maintained in accordance with the Institution of Engineering and Technology (IET) Wiring Regulations and will be subject to routine examination and testing by competent persons every 5 years.	• Use of plant/equipment designed to relevant British or equivalent standards, coupled with installation and maintenance by certified electrical personnel reduces the likelihood to low • Releases of firewater cannot reach surface water and/ or groundwater as drainage is directed to foul sewer.. Appropriate design of the foul sewer arrangements including drainage from Installation Boundary passing through	Negligible adverse impact from localised pollution of surface water and groundwater.	Low

Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	Overall Risk
				Class 1, full interceptors which are monitored and alarmed for presence of hydrocarbons.		
Naked Lights	• Local residents/ businesses beyond the installation boundary, air, land and water. • On-site personnel when visiting the site and infrastructure.	• Smoke release to air • Release of fire waters to drains	No naked lights or flames will be permitted on site, and all lights will be designed to appropriate standards.	• Preventing naked lights or flames will reduce the risk to negligible. • Releases of firewater cannot reach surface water and/ or groundwater as drainage is directed to foul sewer.. Appropriate design of the foul sewer arrangements including drainage from Installation Boundary passing through Class 1, full interceptors which are monitored and alarmed for presence of hydrocarbons.	Negligible adverse impact from localised pollution of surface water and groundwater.	Insignificant
Discarded smoking materials	• Local residents/ businesses beyond the installation boundary, air, land and water. • On-site personnel when visiting the site and infrastructure.	• Smoke release to air • Release of fire waters to drains	Designated smoking shelters will be provided onsite – these are outside the installation boundary.	• Designated smoking shelter will reduce risk to negligible • Releases of firewater cannot reach surface water and/ or groundwater as drainage is directed to foul sewer.. Appropriate design of the foul sewer arrangements including drainage from Installation Boundary passing through Class 1, full interceptors which are monitored and alarmed for presence of hydrocarbons.	Negligible adverse impact localised pollution of surface water and groundwater.	Insignificant
Hot works	• Local residents/ businesses beyond the installation boundary, air, land and water. • On-site personnel when visiting the site and infrastructure.	• Smoke release to air • Release of fire waters to drains	All such works will be planned and undertaken in accordance with a defined risk assessment and method statement (RAMS which is subject to approval before the work commences. Hot works will be completed in line with a Hot Works Procedure including. • A permit to work (PTW) system to ensure appropriate controls will be in place before, during and after any hot works; • Ensuring that fire extinguishers are present at the point of any hot work so that they can be used immediately should a fire occur. Extinguishers will be stationed adjacent to the pathway of escape from the work area and operators undertaking hot works will be trained in the use of fire extinguishers; • Sources of combustible material will be removed from the area where hot works is taking place before work commences and where this is not possible then such materials including mobile plant hydraulic lines will be covered by a fire blanket/screen and/or damped down with water before work commences; and • A fire watch will be present during all hot works and for a minimum of 30 minutes after such hot works have ceased to ensure that sparks from works are not smouldering.	• Use of process safety and isolation procedures and hot works control should reduce the likelihood to low • Releases of firewater cannot reach surface water and/ or groundwater as drainage is directed to foul sewer.. Appropriate design of the foul sewer arrangements including drainage from Installation Boundary passing through Class 1, full interceptors which are monitored and alarmed for presence of hydrocarbons.	Negligible adverse impact due to localised pollution of surface water and groundwater.	Low
Build-up of combustible materials	Local surface water and/ or groundwater.	• Flow by gravity through drainage systems or unsurfaced areas. • Cracked drains/ hardstanding leading to soil and groundwater.	• Regular operator checks for signs of leaks and repairs are dealt with promptly if identified. • High standards of housekeeping are maintained across the site. • Spill kits are available to deal with any leaks. • Suitable waste storage receptacles will be provided during maintenance and will be secured and clearly labelled. All waste generated during maintenance will be removed on completion of maintenance tasks. • Operator will ensure procedures are in place to implement any necessary remedial measures.	• Appropriate design and management controls should prevent this from happening. s. Probability is therefore very low. • Releases of firewater cannot reach surface water and/ or groundwater as drainage is directed to foul sewer.. Appropriate design of the foul sewer arrangements including drainage from Installation Boundary passing through Class 1, full interceptors which are monitored and alarmed for presence of hydrocarbons.	Negligible adverse impact from localised pollution of surface water and groundwater.	Insignificant

6.3.5 Climate Risk

Potential changing climate variable	Impact	Probability	Consequence	Risk Rating	Mitigation & Controls	Probability (after mitigation)	Consequence (after mitigation)	Residual Risk
1. Summer daily maximum temperature may be up to 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.	No significant impacts are identified as a result of summer temperatures increasing by 7°C. If a loss of electrical supply from the grid occurs during a period of high temperatures, the emergency back-up generators would operate to ensure the site load and cooling systems are supported. This would result in emissions to air and potential exceedances to local air quality if the outage was prolonged.	Likely	Mild	Low	• Cabling will be buried underground, insulating against overheating during heatwaves; • Installation will be designed to UK standards and specifications[5]	Likely	Mild	Low
2. Winter daily maximum temperature could be 4°C more than the current average with the potential for more extreme temperatures, both warmer and colder than present.	• An increase of 4°C on winter temperatures would be unlikely to cause any adverse impacts on grid electrical provision. Warmer temperatures may make it less likely that the generators would be required to operate. • A drop in temperature could result in externally situated plant or equipment freezing.	Likely	Mild	Low	No mitigation required as very low risk. Score under 5.	Likely	Mild	Low
3. More intense rainfall events than current extremes. Daily rainfall intensity could increase by up to 20% on today's values.	• Extreme rainfall events could cause site flooding from the nearby Grand Union Canal or surface water runoff. • The site is located in flood zone 1 from rivers and the sea, which has a low probability of flooding from rivers and the sea • Generators and fuel tanks are stored within generator enclosures which are fire and water sealed to prevent ingress. • Increased flows in surface water runoff systems may exceed design capacity, leading to system overwhelm and localised flooding; • Bunding capacity reduced due to flooding	Low Likelihood	Mild	Low	• Surface water drainage systems for the wider data centre site have been designed to accommodate attenuation for up to and including the 1 in 100 year return period, with a 40% allowance on climate change. This complies with 'upper limit' in DEFRA guidance. The system has therefore been designed with an appropriate allowance for the impact of climate change. • The surface water drainage network will collect by gravity all rainwater pipes from the proposed buildings, channels and gullies serving the proposed hardstanding areas, and connect into the proposed geocellular attenuation tanks and detention basins. • The total proposed storage volume within the geocellular attenuation tanks is approximately 4,340 m^3, the total proposed storage volume within detention basins is approximately 1,265 m^3 and the total proposed attenuation volume is approximately 5,605 m^3. • The levels have been designed to ensure exceedance flows are directed away from the site boundary and buildings, and towards basins and soft landscaping; • Inspection and maintenance of site drainage systems to ensure all blockages are cleared and all repairs are undertaken; • Plant will be designed to UK standards and specifications.	Unlikely	Mild	Insignificant

[5] The Building Regulations Approved Document Part H: Drainage and Waste Disposal 2010.

Potential changing climate variable	Impact	Probability	Consequence	Risk Rating	Mitigation & Controls	Probability (after mitigation)	Consequence (after mitigation)	Residual Risk
4. Average winter rainfall may increase by 36% on today's averages.	• Extreme rainfall events could cause site flooding from the nearby Grand Union Canal or surface water runoff. • The site is located in flood zone 1 from rivers and the sea, which has a low probability of flooding from rivers and the sea • Generators and fuel tanks are stored within generator enclosures which are fire and water sealed to prevent ingress. • Increased flows in surface water runoff systems may exceed design capacity, leading to system overwhelm and localised flooding; • Bunding capacity reduced due to flooding	Low Likelihood	Mild	Low	• Surface water drainage systems for the wider data centre site have been designed to accommodate attenuation for up to and including the 1 in 100 year return period, with a 40% allowance on climate change. This complies with 'upper limit' in DEFRA guidance. The system has therefore been designed with an appropriate allowance for the impact of climate change. • The surface water drainage network will collect by gravity all rainwater pipes from the proposed buildings, channels and gullies serving the proposed hardstanding areas, and connect into the proposed geocellular attenuation tanks and detention basins. • The total proposed storage volume within the geocellular attenuation tanks is approximately 4,340 m^3, the total proposed storage volume within detention basins is approximately 1,265 m^3 and the total proposed attenuation volume is approximately 5,605 m^3. • The levels have been designed to ensure exceedance flows are directed away from the site boundary and buildings, and towards basins and soft landscaping; • Inspection and maintenance of site drainage systems to ensure all blockages are cleared and all repairs are undertaken; • Plant will be designed to UK standards and specifications.	Unlikely	Mild	Insignificant
5. Sea level could be as much as 0.6m higher compared to today's level.	Grand Union Canal Slough Arm is located adjacent north of the site but is non-tidal. The site is located in flood zone 1 from rivers and the sea, which has a low probability of flooding from rivers and the sea.	N/A	N/A	N/A	The site is not at risk from tidal flood.	N/A	N/A	N/A
6. Drier summers, potentially up to 42% less rain than now.	There would be limited impacts expected for the permitted installation due to lower annual rainfall as water use is not integral to generator operation.	Low Likelihood	Medium	Low	• Plant is designed to relevant standards and specifications; • Routine inspections and housekeeping to remove fine combustible dust; • Develop and train staff on emergency preparedness, including fire response protocols; • Environmental monitoring including ambient temperature and humidity; • Dust emissions are not currently considered an issue although if these increase, mitigation measures will be implemented.	Insignificant	Medium	Low
7. Peak river flows are higher. The flow in the watercourses could be 35% more than now at its peak, and 75% less than now at its lowest.	Grand Union Canal Slough Arm located adjacent north of the site could lead to an increased risk of flooding.. The site is located in flood zone 1 from rivers and the sea, which has a low probability of flooding from rivers and the sea.	Unlikely	Minor	Insignificant	• Surface water drainage systems for the wider data centre site have been designed to accommodate attenuation for up to and including the 1 in 100 year return period, with a 40% allowance on climate change. This complies with 'upper limit' in DEFRA guidance. The system has therefore been designed with an appropriate allowance for the impact of climate change.	Unlikely	Minor	Insignificant

Potential changing climate variable	Impact	Probability	Consequence	Risk Rating	Mitigation & Controls	Probability (after mitigation)	Consequence (after mitigation)	Residual Risk
					• The Operator to arrange periodic inspection of onsite drainage to help ensure there are no blockages or issues with the surface water drainage systems. • Fuel tanks and diesel generators are located internally and stored within generator enclosures to reduce the risk of increased rainfall impacting this mission critical equipment. This equipment will be subject to planned preventative maintenance. • Fuel tank bunds have leak detection and high-level alarms in the unlikely event that these tanks are compromised. The tanks are located internal to the building and within generator enclosures and are regularly inspected for any issues.			
8. Storms: frequency and intensity can increase	• Storms and high winds could damage plant with increased potential for fugitive emissions. • Potential for electrical storms to disturb steady operations and cause plant instability; could increase risk of electrical power losses to site and lead to increased operation of the generators. This would result in emissions to air and potential exceedances to local air quality if the outage was prolonged.	Low Likelihood	Medium	Low	• Site infrastructure, including the drainage network, are subject to routine inspection and maintenance. • Plant to be designed to UK standards and specifications.	Unlikely	Low	Insignificant

7. Conclusion

7.1 Point Source Release to Air

7.1.1 H1 Assessment

A H1 screening assessment of emissions to air was conducted using the Environment Agency's H1 tool (Appendix A). An assessment was completed for each operating scenario for testing, maintenance and emergency. Within the H1 screening:

- Emission process contributions (PCs) which are lower than 1% of the relevant emissions standard for long-term exposure and lower than 10% of the relevant limit for short-term exposure can be screened out as insignificant.
- Predicted Environmental Concentrations (PECs) which are lower than 70% of the relevant long-term emissions standard and lower than 20% of the relevant short-term standard minus 2 * the background concentration can be screened out as insignificant.

The assessment shows that for all scenarios:

- Carbon monoxide (CO) and particulate emissions have a PC less than the threshold and can be screened out as insignificant at stage 1.
- Nitrogen dioxide (NOx) and Hydrocarbon (represented by benzene) do not screen out as insignificant. Emissions have been further assessed within the Air Quality Assessment.

7.1.2 Air Dispersion Assessment

Point source releases to air have been separately assessed through detailed dispersion modelling assessment and the report (Document reference SP3224LP/APP/AQ) is presented in Part 7 of the Application.

The assessment quantifies the potential impact of emissions to air from the generators during both routine testing and emergency operation.

For the purposes of this assessment, several assumptions have been made to ensure that the outputs of the dispersion modelling are reasonably precautionary. These assumptions include:

- The modelled emissions parameters for each generator represents the worst-case value, in terms of air quality impact, across the short-list of generator models being considered for the installation. For example:
    - The highest emissions concentration of each pollutant
    - The lowest emissions exit velocity
    - The lowest emissions temperature
- Each generator has been modelled to operate at 100% load for all testing, maintenance and emergency operations. Emission rates used in the modelling represent maximum rated output for each generator, and no partial-load adjustments have been applied.

Detailed dispersion modelling using the atmospheric dispersion model ADMS (V6) has been used to calculate the predicted PC at each receptor location. These concentrations have been compared with the relevant Environmental Standard for each pollutant species released.

The assessment has identified that the operation of the installation under testing and maintenance, and under emergency operation would not cause an air quality compliance issue with impacts screened out as insignificant. Hypergeometric distribution analysis of the hourly

mean NO2 impact during an emergency identified the probability of an exceedance occurring of less than 1% with up to 72 hours of emergency operation in a year.

In relation to impact on ecological sites:

- All scenarios screened as insignificant against the air quality standards and for nitrogen deposition; and
- All scenarios were <0.1% of the critical load for acid deposition.

7.2 Qualitative Environmental Risk Assessment

The following risks have been assessed within this document:

- Fugitive emissions to air, land and water;
- Nuisance issues such as litter, odour, noise and vibration;
- Visible plumes
- Abnormal operations and accidents
- Fire Risk
- Climate Risk

The assessment concluded that the implementation of the proposed controls and mitigation measures are designed to meet the relevant BAT requirements and will reduce the residual risk to low or low to moderate.

Appendix A H1 Screening Assessment