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**VDC LHR11 LIMITED**

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# Environmental Permit Application: Environmental Risk Assessment

LHR -1, Chandos Road, Park Royal, London

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## 1. Introduction

This document supports the application submitted by VDC LHR11 Limited (“Vantage”) to the Environment Agency (“EA”) under the Environmental Permitting (England and Wales) Regulations 2016 (as amended) (the “Regulations”) for a Part A(1) Environmental Permit (application reference EA/EPR/EP3508PS/A001) associated with the operation of combustion plant at the data centre operated by Vantage located at Chandos Park Industrial Estate, Chandos Road, Park Royal, London, NW10 6NF (“the site” or “the Facility”).

The application relates to the proposed operation of combustion plant at the site, comprising diesel-fired electricity generators with an aggregated net rated thermal input capacity of >50MWth.

The application process for bespoke permits requires that an Environmental Risk Assessment (ERA) is completed in accordance with the Environment Agency’s guidance<sup>1</sup>.

In accordance with the Environment Agency’s guidance, this ERA is structured as follows:

- Identification and consideration of risks at the Installation and sources of the risks;
- Identification of receptors (people, animals, property and anything else that could be affected by the hazard) at risk from the Installation;
- Identification of possible pathways from the sources of the risks to receptors;
- Assessment of the risks relevant to the specific activities carried out at the Installation and consideration of which risks can be screened out as negligible; and
- Description of measures to control identified risks.

## 2. Risk Assessment Methodology

### 2.1 Overview

This risk assessment has been developed in accordance with the Environment Agency guidance<sup>2</sup> for the preparation of risk assessments. The Environment Agency guidance promotes the following process:

- Identify and consider risks for the Installation, and the sources of the risks;
- Identify the receptors (people, animals, property and anything else that could be affected by the hazard) at risk from the Installation;
- Identify the possible pathways from the sources of the risks to the receptors;
- Assess risks relevant to the activity at the Installation and check they’re acceptable and can be screened out;
- State what measures are applied to control risks if they’re too high; and
- Submit the risk assessment as part of the environmental permit application.

The risk assessment should identify whether any of the following risks could occur and what the environmental impact could be:

<sup>1</sup> <https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit> Environment Agency Website. Accessed on 01/08/2019

<sup>2</sup> <https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit> Environment Agency Website. Accessed on 01/08/2019.

- any emission to air or discharge, for example sewage or trade effluent to surface or groundwater;
- accidents;
- odour;
- noise and vibration;
- uncontrolled or unintended ('fugitive') emissions, for which risks include dust, litter, pests and pollutants that shouldn't be in the discharge; and
- visible emissions (e.g. smoke or visible plumes).

## 2.2 Risk Assessment Layout

A qualitative assessment for generic risks identified at the Installation is provided in Section 4, and quantitative assessments derived from specific operations and release points are provided in Section 5.

For the qualitative assessment, each actual or possible hazard is identified, and the assessment is then tabulated taking into account the following criteria:

- the hazard - for example dust, litter, type of visible emission;
- the receptors - people, animals, property and anything else that could be affected by the hazard;
- the pathways - how the hazard can get to a receptor;
- what measures will be taken to reduce risks;
- probability of exposure, for example whether a risk is unlikely or highly likely;
- consequences - what harm could be caused; and
- what the overall risk is, based on what the information presented in the table - for example 'low if management techniques applied'.

For the quantitative assessment, it is possible to 'screen out' potential risks from emissions to air, discharges to water or deposition onto land by carrying out quantitative tests to check whether they're within acceptable limits or environmental standards. If they are, the risk to the environment is considered to be insignificant and no further assessment is required.

## 2.3 Assessing Likelihood and Consequence

Within the risk assessment, each hypothesised relationship between contaminants, pathways and receptors is assessed to determine the likelihood of the receptor being exposed to pollution and the consequences of exposure using the rankings listed in the tables below.

**Table 1: Likelihood Rankings**

Very Low	Low	Medium	High
Exposure to pollution is considered to be <i>highly unlikely</i> .	Exposure is considered to be <i>unlikely</i> .	Exposure is considered to be <i>likely</i> .	Exposure is considered to be <i>highly likely</i> to occur.

**Table 2: Consequence Rankings**

Very Low	Low	Medium	High
No impact or imperceptible impact on the receptor.	Low level impact easily and quickly mitigated or may not require any	Moderate impact which will not be rectified without some mitigation / intervention.	High impact requiring significant intervention / mitigation and may have

	intervention to rectify any impact.		caused irreparable damage to the receptor.
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### 2.4 Assessment of Risk

Following the determination of the likelihood and consequence rankings for the hypothesised relationships developed using the source-pathway-receptor concept, the matrix in the table below is used to determine the overall risk of the pollution exposure occurring.

**Table 3: Risk Matrix**

		Likelihood			
		Very Low	Low	Medium	High
Consequences	High	Low	Medium	High	High
	Medium	Low	Medium	Medium	High
	Low	Low	Low	Medium	Medium
	Very Low	Very Low	Low	Low	Low

## 3. Identification of Risks

As part of the application, the Client is required to identify the environmental risks (sources of potential contamination) which could occur during the operation of the Facility, including any risks which may arise from accidents. The EA online guidance<sup>3</sup> stipulates that the Client, as the operator of the site, must consider the following potential risks:

- any discharge (e.g. sewage or trade effluent to surface water or groundwater);
- accidents;
- odour;
- noise and vibration;
- uncontrolled and unintended ('fugitive') emissions (for which risks include dust, litter, pests; and pollutants that shouldn't be in the discharge); and
- visible emissions (e.g. smoke or visible plumes).

In considering the risk, the Client can determine that a potential risk is not considered to be significant in terms of its potential impact on the environment; however, a justification must be provided for any risk which is 'screened out'.

Based on the guidance summarised above, the potential environmental risks at the Facility have been identified and have been determined as either applicable or not applicable based on the potential environmental impact arising from the risk. A summary of these risks is presented in the table below which also provides justifications where risks are considered to be insignificant. The risks which have been identified as significant have been included in the risk assessment in Section 5 of this report.

<sup>3</sup> <https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit#risks-from-your-site> Environment Agency Website. Accessed on 16/04/2019.

<b>Environmental Risk</b>	<b>Applicability</b>	<b>Justification</b>
Controlled discharges to surface waters	Not Applicable	There are to be no controlled discharges to surface waters from the combustion activities at the Installation, therefore this risk has not been considered for further assessment.
Controlled discharges to Groundwater	Not Applicable	There are to be no controlled discharges to groundwater from the Installation. This risk has not been discounted from further assessment.
Accidents	Applicable	<p>Equipment Failure: The failure of equipment may result in an incident occurring which could potentially impact on the environment (e.g. storage tanks, drainage systems etc.).</p> <p>Materials Handling: Fuels are stored on-site in bulk storage tanks, which are filled from road tankers. There is the potential for accidents (e.g. spills, leaks etc.) to occur during the filling of bulk storage tanks, which may result in contaminated run-off.</p> <p>Vandalism: The Facility is located in an urban area and may be targeted for vandalism and theft.</p> <p>Operator Error: Delivery and transfer of fuels.</p> <p>Flooding: The site is not situated in a location with an increased risk of surface water flooding.</p> <p>Fire: Emissions to air or contaminated runoff.</p>
Odour	Not Applicable	There are no odour emissions from the Installation. This risk has not been considered for further assessment.
Noise & Vibration	Applicable	The operation of generators has the potential to generate noise and vibration.
Visual Impact	Not Applicable	<p>The Installation is positioned within an urban area of mixed commercial, industrial and residential use.</p> <p>Visible emissions from the regulated activity are limited to flue gases emitted during the operation and testing of the generators. Given the irregular short-term duration of generator operations. These emissions are not considered to be significant in terms of visual impact. Based on this, visual impact has not been included for further assessment.</p>
Fugitive Emissions to Air and Water	Not Applicable	Fugitive emissions to air and water are not anticipated to arise at the Installation and therefore fugitive emissions to air and water have been excluded from further assessment.
Controlled Releases to Air	Applicable	Air emissions associated with the regulated activity comprise flue gases arising from the operation of the electricity generators.

## 4. Potential Pollution Pathways

### 4.1 Identification of Pollution Pathways

The potential pollution pathways between the sources identified in Section 2 (excluding those which have been screened out) and the receptors identified in Section 3 are summarised in the table below.

Source	Potential Pathway	Receptor
<b>Accidents:</b> equipment failure; materials handling; vandalism; operator error; fire; and, flooding.	Over Installation surfaces; through Installation drainage systems; and through the air.	Surface water; groundwater; ground; atmosphere, and humans including: workers/ visitors present at the Installation; workers / occupants / visitors on adjacent premises; local residents; intermittent presence on pedestrian routes / roadways surrounding the Installation.
<b>Noise and Vibration:</b> arising from the operation of the combustion plant present at the Installation (i.e. generators) and from traffic movements.	Transmitted through the air and through ground vibration.	Humans including: workers/ visitors present at the Installation; workers / occupants / visitors on adjacent premises; local residents; intermittent presence on pedestrian routes / roadways surrounding the Installation.
<b>Controlled Releases to Air:</b> from point sources (e.g. generator flues).	Through the air; windblown.	Atmosphere, and humans including: workers/ visitors present at the Installation; workers / occupants / visitors on adjacent premises; local residents; intermittent presence on pedestrian routes / roadways surrounding the Installation.

## 5. Environmental Risk Assessment

### 5.1 Accidents

The risk assessment for accidents at the Installation is provided below.

Source-Pathway-Receptor Hypothetical Model			Risk Management Techniques	Assessing the Risk		
Source of Pollution	Receptor	Pathway		Likelihood of Exposure	Consequence of Exposure	Overall Risk
<p><i>Accident:</i> Failure in containment of diesel storage tank and associated equipment (valves, pipes etc.).</p>	<p><i>Ground Groundwater Surface Water</i></p>	<p>Over Installation surfaces; and, through Installation drainage systems.</p>	<ul style="list-style-type: none"> <li>Fuel day tanks shall have automatic leak detection, level detectors and a common overflow and drain line connected to an external dump tank shall be provided.</li> <li>The dump tank shall have sufficient capacity to contain the total volume of fuel stored within the generator building.</li> <li>All storage tanks, including the dump tank, will be provided with secondary containment providing 110% of the capacity of the primary storage container.</li> <li>The diesel fuel is to be stored in double skinned below ground bulk storage tanks, which will be connected to a central filling station, equipped with spill containment measures.</li> <li>All below ground pipework will be double walled and come complete with leak detection and interstitial monitoring.</li> <li>All above ground pipework and where the pipework is exposed and has potential to be in contact with flames or hazardous products will be single walled and metallic.</li> <li>Pipework between the external bulk storage tanks and generator building fuel pump room shall be contained within a pipe box.</li> <li>The minimum cover to the top of the below ground pipework shall be 600mm below finished pavement level in order to provide protection from external loads. Protection slabs shall be installed to protect</li> </ul>	<p>Very Low</p>	<p>High</p>	<p><b>Low</b></p>

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Source-Pathway-Receptor Hypothetical Model			Risk Management Techniques	Assessing the Risk		
Source of Pollution	Receptor	Pathway		Likelihood of Exposure	Consequence of Exposure	Overall Risk
			<p>underground utilities, including underground storage tanks and the petrol/ oil separator, from high loading vehicles on site.</p> <ul style="list-style-type: none"> <li>• Drainage for the concrete hardstanding is served by a class 1 full retention interceptor which will be routed belowground to the rear of the fill point cabinet where it shall rise above ground and discharge within the intercepted area.</li> <li>• Diesel storage tanks are fitted with high-level alarms, overfill protection devices and bund alarms, which are linked into the building management system.</li> <li>• Spill kits will be present in fuel storage areas to minimise the impacts of any spillage.</li> <li>• Fuel storage tanks shall have access hatches for inspection on a regular basis to identify defects (if any).</li> </ul>			
<p><i>Accident:</i> Spillage during refuelling / fuel polishing (e.g. pipe rupture, tanker rupture, connection fault etc.)</p>	<p>Ground Groundwater Surface Water</p>	<p>Over Installation surfaces; and, through Installation drainage systems.</p>	<ul style="list-style-type: none"> <li>• All deliveries of fuel will be attended to identify any issues during delivery.</li> <li>• All deliveries of fuel take place in areas of hard standing coated with an impermeable non-slip coating resistant to hydrocarbons.</li> <li>• The external bulk storage tanks will be filled centrally from a security cabinet housing the tank fill points, level gauges and overfill alarms. The security cabinet shall have spillage containment and be fitted with a secure access door.</li> <li>• The fuel delivery area will comprise a hard standing which shall be bound by slot drainage leading to a below ground class 1 full retention interceptor</li> <li>• Spill kits will be provided in refuelling areas.</li> <li>• The Operator will establish formal refuelling and spill response procedures as part of the environmental management system.</li> </ul>	<p>Very Low</p>	<p>High</p>	<p><b>Low</b></p>

Source-Pathway-Receptor Hypothetical Model			Risk Management Techniques	Assessing the Risk		
Source of Pollution	Receptor	Pathway		Likelihood of Exposure	Consequence of Exposure	Overall Risk
			<ul style="list-style-type: none"> <li>• Deliveries of fuel are expected to be infrequent since the generators are only to be used for emergency operations.</li> <li>• Fuel polishing takes place very infrequently and is a short duration activity – typically complete within a few hours per tank.</li> <li>• Drip trays shall be provided underneath the fuel pumps in case of a leakage.</li> </ul>			
<i>Accident:</i> Flooding potential to impact drainage system and generators.	<i>Surface Water</i>	Through flood water, over surfaces & through Installation drainage systems discharging to ground via soakaway.	<ul style="list-style-type: none"> <li>• Metal and concrete construction of the tanks, connective pipework and containment infrastructure, so that there is minimal risk of water damage leading to spillage in a single flooding event.</li> <li>• The Facility is not located in an area of elevated flood risk, so probability of a flood occurrence is very low.</li> </ul>	Very Low	High	<b>Low</b>
<i>Accidents (Fire):</i> Fire and arson attacks	<i>Humans including:</i> workers/ visitors present at the Installation; workers / occupants / visitors on adjacent premises; local residents; intermittent presence on pedestrian routes / roadways surrounding the Installation.	Over Installation surfaces; through the air; and, through Installation drainage systems.	<ul style="list-style-type: none"> <li>• A perimeter fence is present along the site boundary and all access points are secured with gates, which will only open for authorised personnel.</li> <li>• CCTV is present covering all external areas of the Installation.</li> <li>• A Security team is present at the site on a permanent basis. Regular site surveillance walks are undertaken by the security team.</li> <li>• The generator containers and fill points are kept locked.</li> <li>• The generator sets are set away from the perimeter fencing.</li> <li>• All generator sets have fire detection systems present within the generator containers, which when triggered activate fuel cut off valves.</li> <li>• All above ground pipework and where the pipework is exposed and has potential to be in contact with flames or hazardous products shall be single walled and metallic.</li> </ul>	Very Low	High	<b>Low</b>

Source-Pathway-Receptor Hypothetical Model			Risk Management Techniques	Assessing the Risk		
Source of Pollution	Receptor	Pathway		Likelihood of Exposure	Consequence of Exposure	Overall Risk
<i>Accidents (Vandalism):</i> Damage / theft of externally located equipment / tanks	<i>Surface Water</i>	Over Installation surfaces; through the air; and, through Installation drainage systems.	<ul style="list-style-type: none"> <li>• Fire detection and sprinkler systems shall be provided throughout the Installation, including the generator building.</li> <li>• A perimeter fence is present along the site boundary and all access points are secured with gates, which will only open for authorised personnel.</li> <li>• CCTV is present covering all external areas of the Installation, which shall be monitored at all times by site security.</li> <li>• As part of the security deployment, cameras shall be installed in surrounding areas, including corridors and roadways leading to, or around the Installation to capture and record images of personnel movement.</li> <li>• A Security team is present at the site on a permanent basis. Regular site surveillance walks are undertaken by the security team.</li> <li>• The generator containers and fill points are kept locked.</li> <li>• The generator sets are set away from the perimeter fencing.</li> </ul>	Very Low	Medium	<b>Low</b>
	<i>Atmosphere</i>					
	<i>Ground</i>					
	<i>Groundwater</i>					

## 5.2 Noise

There is a potential for noise to arise from the operation of the electricity generators and from the occasional movement of refuelling / maintenance vehicles at the Facility. The risk assessment for individual noise sources is provided below.

Source-Pathway-Receptor Hypothetical Model			Risk Management Techniques	Assessing the Risk		
Source of Pollution	Receptor	Pathway		Likelihood of Exposure	Consequence of Exposure	Overall Risk
<p><i>Noise and vibrations:</i> arising from the movement of vehicles, and engine noise / alarms when visiting the Installation.</p> <p><i>Noise and vibration:</i> arising from the operation of plant (comprising electricity generators)</p>	<p><i>Humans including:</i> workers/ visitors present at the Installation; workers / occupants / visitors on adjacent premises; local residents; intermittent presence on pedestrian routes / roadways surrounding the Installation.</p>	<p>Through the air and ground vibration</p>	<ul style="list-style-type: none"> <li>Deliveries of fuel are very infrequent, limiting potential for disturbance.</li> <li>Generators are only used as emergency provision in the event of a failure in the National Grid supply; therefore, the generators do not require regular refuelling.</li> </ul>	Low	Low	<b>Low</b>
			<ul style="list-style-type: none"> <li>The generators are all contained within buildings designed to provide appropriate noise attenuation.</li> <li>All generators at the site are maintained in accordance with manufacturers' specifications to minimise excessive noise from poor performance.</li> <li>Generators are only used as emergency provision in the event of a failure in the National Grid supply; therefore, the generators will only be run for testing purposes, or in the event of a National Grid power failure.</li> <li>Noise Impact Assessment undertaken demonstrates that the operation of the Generators will not have a significant impact on background daytime and nighttime noise levels.</li> </ul>	Low	Low	<b>Low</b>

### 5.3 Controlled Releases to Air

The risk assessment for controlled releases to air is presented in the table below.

Source-Pathway-Receptor Hypothetical Model				Assessing the Risk		
Source of Pollution	Receptor	Pathway	Risk Management Techniques	Likelihood of Exposure	Consequence of Exposure	Overall Risk
Controlled Releases to Air: Generator emissions; venting from bulk diesel storage tanks	Humans including: workers/ visitors present at the Installation; workers / occupants / visitors on adjacent premises; local residents; intermittent presence on pedestrian routes / roadways surrounding the Installation.  Atmosphere	Through the air	<ul style="list-style-type: none"> <li>Generators run very infrequently (&lt;50 hours a year).</li> <li>Generators do not significantly impact background NOx concentrations.</li> <li>Generators will be maintained under a service agreement, undertaking inspections and carrying out any required maintenance.</li> <li>As far as reasonably practicable, the testing of generators will not be co-incidental.</li> </ul>	Medium	Low	Low

## 6. Conclusions

The review of potential environmental impacts at the Installation has identified a range of potential impacts from releases to air, noise generation and accidents at the Installation. The site will apply both physical and procedural measures to reduce the risks from these activities to a level considered to represent BAT for the installation.