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Environmental Permit Application: Environmental Risk Assessment

LON3, 111 Buckingham Avenue, Slough,
Berkshire, SL1 4PF



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Sustainable change.

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Contents

1.	Introduction	2
2.	Risk Assessment Methodology	2
2.1	Overview	2
2.2	Risk Assessment Layout	3
2.3	Assessing the Likelihood and Consequence	3
2.4	Assessment of Risk	4
3.	Identification of Risks	4
4.	Potential pollution Pathways	6
4.1	Identification of Pollution Pathways	6
5.	Environmental Risk Assessment	8
5.1	Accidents	8
5.2	Noise	15
5.3	Controlled Releases to Air	17
6.	Conclusions	18

1. Introduction

This document supports the application submitted by I3 Solutions Group Limited (“I3 Solutions” 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 EPR/YP3722SR/P001) associated with the proposed operation of combustion plant at a planned data centre to be operated by Iron Mountain Data Centres (“Iron Mountain”) and located at (“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 guidance¹.

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 guidance¹ 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:

- any emission to air or discharge, for example sewage or trade effluent to surface or groundwater;
- accidents;
- odour;
- noise and vibration;

¹ <https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit> Environment Agency website. Accessed on 23/01/2024.

- 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 the 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 Ranking

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 intervention to rectify any impact.	Moderate impact which will not be rectified without some mitigation / intervention.	High impact requiring significant intervention / mitigation and may have caused irreparable damage to the receptor.

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
Consequence	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 guidance² 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.

² <https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit#risks-from-your-site> Environment Agency website. Accessed on 3/01/2024.

Environmental Risk	Applicability	Justification
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 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 belly tanks associated with each generator. Each belly tank is able to provide 48 hours' worth of fuel and the largest of these tanks is 42,000L (usable capacity). The tanks located on the gantry will be filled via a fuel transfer system. Road tankers will pump out fuel via the fill point into two 1,800L transfer tanks to enable the onward distribution of fuel into each belly tank on level 2 of the gantry. The office generator will be filled directly, independent of the transfer system. There is the potential for accidents (e.g. spills, leaks etc.) to occur during the filling of the belly tanks, which may result in contaminated run-off.</p> <p>Vandalism: The Facility is located in a mixed industrial and urban area and may be targeted for vandalism and theft.</p> <p>Operator Error: Delivery and transfer of fuels.</p> <p>Flooding: Environment Agency long term flood risk mapping indicates areas in the north and centre of the site not currently occupied by buildings (approximately 40% total site area) are located in areas of elevated flood risk (high flooding probability) from pluvial sources. The north-east of the site is also located in an area of medium risk to pluvial 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	The Installation is positioned within an urban area of predominantly mixed commercial and industrial use. 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.
Fugitive Emissions to Air & 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.

Environmental Risk	Applicability	Justification
Accidents: 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.
Noise and Vibration: arising from the operation of the combustion plant	Transmitted through the air and through ground vibration.	Humans including: workers/ visitors present at the Installation; workers / occupants / visitors on adjacent

<p>present at the Installation (i.e. generators) and from traffic movements.</p> <p>Controlled Releases to Air: from point sources (e.g. generator flues).</p>	<p>Through the air; windblown.</p>	<p>premises; local residents; intermittent presence on pedestrian routes / roadways surrounding the Installation.</p> <p>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.</p>
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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 fuel storage tanks (belly tanks) and associated equipment (valves, pipes etc.).</p>	<p><i>Ground</i> <i>Groundwater</i> <i>Surface Water</i></p>	<p>Over Installation surfaces; and, through Installation drainage systems.</p>	<ul style="list-style-type: none"> The fuel belly tanks, and fuel transfer tanks, shall be equipped with primary and secondary containment. The two diesel pumps associated with the sprinkler system will have integral belly tanks. These will be fed by a 1,000L capacity integrally bunded tank situated inside the pump house. This tank will also be serviced by tertiary bunding in the form of concrete upstands. Generator fuel meters will be situated on the supply and return lines between the belly tank and engine. The central fuel transfer system tanks will have fuel level alarms for low-low level (<5% capacity), low level (<20% capacity), high level (>80% capacity) and high-high level (% capacity), in addition to variable level sensors and leak detection. Leak detection will be compliant with local and national environmental codes and standards. The Building Management System will be linked to both the leak detection system and fuel gauge. 	Very Low	High	Low

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>Fuel gauges will be in the form of a sight guage and ultrasonic level measurement sensors.</p> <ul style="list-style-type: none"> The central fuel tanks will be earthed to prevent accidents associated with lightening strikes. The transfer system tanks will have integral secondary containment providing 110% of the capacity of the primary storage container. The tanks will be designed in line with BS799-5: 2010, and constructed from treated mild plate steel and have the outer panelling painted with oil and weather resistant paint. All of the fuel filling lines and pipelines situated within the gantry area involved in the transfer of fuel from the fill point to the generators are planned to be equipped with class I propriety leak detection systems. The pipelines are designed to have double walls with the leak detection system associated with the interstitial space. Each generator belly tank will have drain down piping fitted with leak detection linked to the BMS. Drainage for the hardstanding associated with the service yard will be served by a full retention interceptor which will be routed belowground. 			

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"> Spill kits will be present in fuel storage areas to minimise the impacts of any spillage. The transfer system fuel storage tanks shall have access hatches for inspection on a regular basis to identify defects (if any). A further watertight, sealed and bolted hatch will be present associated with draining water from the tank. 			
<p><i>Accident:</i> Spillage during refuelling (e.g. pipe rupture, tanker rupture, connection fault etc.)</p>	<p><i>Ground</i> <i>Groundwater</i> <i>Surface Water</i></p>	<p>Over Installation surfaces; and, through Installation drainage systems.</p>	<ul style="list-style-type: none"> All deliveries of fuel will be attended to identify any issues during delivery. Each fill line associated with the fuel receiver tanks will have overfill protection. The fill points for the receiver tanks will have spill provisions independent of the tank bunding in the form of a welded steel, painted drip tray or bund. All deliveries of fuel will take place in the service yard area which comprises of hard standing. The belly tanks, which will be fitted with an analogue level gauge with transmitter and a level switch with four contact levels, are to be filled directly from tankers via a fill point. The filling point will have overfill protection equipment. The lines associated with fuel delivery from the tanks to the generators will have Class I proprietary leak detection systems and have double walls. 	Very Low	High	Low

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"> The belly tanks will have fuel level reading alarms associated with low-low level, low level, high level and high-high level. The generator fuel system will also have leak detection. The fuel delivery area will comprise a regraded hard standing area and be served by a below ground full retention interceptor. Several measures will be in place associated with the fuel fill point control panel. These measures will be monitored by the Building Management System and are to include the ability to view fuel fill level for each belly tanks on the generators, select fuel transfers to individual generator belly tanks, automatic pumping, safeguards to mitigate the overfilling of the transfer tanks. The bunding for the fuel transfer tanks will also serve the associated pumping arrangement and pipeline ancillaries. Generator fuel meters will be situated on the supply and return lines between the belly tank and engine. Spill kits will be provided in refuelling areas. The Operator will establish formal refuelling and spill response procedures as 			

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>part of the environmental management system.</p> <ul style="list-style-type: none"> Deliveries of fuel are expected to be infrequent since the generators are only to be used for emergency operations and periodic testing. Drip trays shall be provided underneath the fuel pumps in case of a leakage. 			
<p>Accident: Flooding potential to impact drainage system and generators.</p>	<p><i>Surface Water</i></p>	<p>Through flood water, over surfaces & through Installation drainage systems.</p>	<ul style="list-style-type: none"> 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. Environment Agency flood mapping indicates areas in the north and east of the site not currently occupied by buildings (approximately 15% total site area) are located in areas of elevated flood risk (high flooding probability) from pluvial sources. The south-west of the site is also in an area of medium pluvial flooding probability. The generators will be located in the east of the site on level 2 of a gantry suggesting it would be unlikely for floodwater to make contact with the generators themselves. 	<p>Low</p>	<p>Medium</p>	<p>Medium</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
Accidents (Fire): Fire and arson attacks	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.	Over Installation surfaces; through the air; and, through Installation drainage systems.	<ul style="list-style-type: none"> A perimeter fence will be present along the site boundary and all access points are to be secured with gates. Specifically, the service yard will be secured from the visitor zone by a non-climb fence of at least 3m in height. Motion sensitive video surveillance (CCTV) will be present covering areas around the Installation perimeter. Security lighting will also be in place. As part of the security deployment, controlled access will be in place throughout the main data center building cameras shall be installed on exits not equipped with card reader access due to emergency exit provisions. A guard house, occupied by up to two operators is planned. Up to three security staff will be based in a Security Operations Centre for monitoring. The generator containers and fill points will be kept locked. The generator sets are set away from the perimeter fencing located on a gantry. All generator sets have fire detection systems present within the generator containers, which when triggered activate fuel cut off valves. 	Very Low	High	Low

Source-Pathway-Receptor Hypothetical Model			Risk Management Techniques	Assessing the Risk		
Source of Pollution	Receptor	Pathway		Likelihood of Exposure	Consequence of Exposure	Overall Risk
Accidents (Vandalism): Damage / theft of externally located equipment / tanks	Surface Water	Accidents (Vandalism): Damage / theft of externally located equipment / tanks	<ul style="list-style-type: none"> All pipework forming the class 1 leak detection system shall be constructed of HDPE and formed of a proprietary double wall secondary containment products system. Generator enclosures will have point smoke detection. The generators enclosures will have pre action sprinkler valves. Sprinkler water distribution equipment (pipework and sprinkler heads) will be supplied each generator and connected to the site sprinkler distribution system. 	Low	Medium	Medium
			<ul style="list-style-type: none"> A perimeter fence will be present along the site boundary and all access points are to be secured with gates. Specifically, the service yard will be secured from the visitor zone by a non-climb fence of at least 3m in height. All exterior doors will be forced entry rated and steel bollards will protect the gantry from vehicle strikes. Motion sensitive video surveillance (CCTV) will be present covering areas around the Installation perimeter. Security lighting will also be in place. As part of the security deployment, controlled access will be in place throughout the main data center building 			

Source-Pathway-Receptor Hypothetical Model			Risk Management Techniques	Assessing the Risk		
Source of Pollution	Receptor	Pathway		Likelihood of Exposure	Consequence of Exposure	Overall Risk
			cameras shall be installed on exits not equipped with card reader access due to emergency exit provisions. <ul style="list-style-type: none"> • A guard house, occupied by up to two operators is planned. • Up to three security staff will be based in a Security Operations Centre for monitoring. • Receiver tanks and fill points will be kept locked. • The generator sets are located on a gantry set away from the perimeter fencing. 			

5.2 Noise

Source-Pathway-Receptor Hypothetical Model			Risk Management Techniques	Assessing the Risk		
Source of Pollution	Receptor	Pathway		Likelihood of Exposure	Consequence of Exposure	Overall Risk
Noise and vibrations: arising from the movement of vehicles, and engine noise / alarms when visiting the Installation.	Humans including: workers/ visitors present at the Installation; workers / occupants / visitors on adjacent		<ul style="list-style-type: none"> • Deliveries of fuel are expected to be very infrequent, limiting potential for disturbance. • Generators will only be used as emergency provision in the event of a failure in the National Grid supply; therefore, the generators do 	Low	Low	Low

<p>Noise and vibration: arising from the operation of plant (comprising electricity generators)</p>	<p>premises; local residents; intermittent presence on pedestrian routes / roadways surrounding the Installation.</p>		<p>not require regular refuelling.</p> <ul style="list-style-type: none"> • The generators are all expected to be housed within acoustic enclosures to provide some noise attenuation. • All generators at the site are expected to be maintained under a service agreement in accordance with the OSD FAC IMDC Maintenance Standard v2.0 and SSFG 20 to minimise excessive noise from poor performance. • Generators will only be 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. • Noise Impact Assessment undertaken demonstrates that the operation of the Generators will not have a significant impact on background daytime and nighttime noise levels. 	<p>Low</p>	<p>Low</p>	<p>Low</p>
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5.3 Controlled Releases to Air

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	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"> Generators run very infrequently (<80 hours a year). Generators do not significantly impact background NOx concentrations. Generators will be maintained under a service agreement, undertaking inspections and carrying out any required maintenance. As far as reasonably practicable, the testing of generators will not be co-incident. 	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.