

Permitting decisions

Bespoke permit

We have decided to grant the permit for Equinix Slough Campus operated by Equinix (UK) Limited

The permit number is EPR/LP3303PR/A001

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

Purpose of this document

This decision document provides a record of the decision making process. It summarises the decision making process in the decision checklist to show how all relevant factors have been taken in to account.

This decision document provides a record of the decision making process. It:

- highlights [key issues](#) in the determination
- summarises the decision making process in the [decision checklist](#) to show how all relevant factors have been taken into account
- shows how we have considered the [consultation responses](#).

Unless the decision document specifies otherwise we have accepted the applicant's proposals.

Read the permitting decisions in conjunction with the environmental permit. The introductory note summarises what the permit covers.

Key issues of the decision

Description of the installation

The site is a data centre which consists of a Schedule 1 Part A(1) 1.1 activity under the Environmental Permitting Regulations for the burning of any fuel in an appliance with a rated thermal input of 50 or more megawatts (MW).

The combustion plant consists of 69 emergency standby generators burning diesel solely for the purpose of providing electricity to the installation in the event of a failure of supply from the National Grid.

Comprising;

Data centre LD4, 8 X 5.029 MW and 2 X 5.123 MW thermal Input generators

Data centre LD5, 6 X 5.714 MW and 8 X 5.2 0 MW thermal Input generators

Data centre LD6, 24 X 3.829 MW thermal Input generators

Data centre LD7, 4 X 5.714 MW and 2 X 6.857 MW thermal Input generators

Data centre LD10, 2 X 0.967 MW and 13 X 5.714 MW thermal Input generators

The total installed capacity is 300.85 MWth.

Electrical power is provided to the data centre from the National Grid. However, in the event of a failure in the electrical supply, the operator will utilise the generators to maintain the electrical supply. The generators will be used solely for the purpose for generating power for the facility. No electricity will be exported from the installation.

The diesel fuel is stored in individual double skinned day tanks adjacent to the generators. The day tanks are refilled from bulk storage tanks except in LD 10 where generators 1-2 have 2,500 litre day tanks and generators 3-5 have 19,600 litre day tanks, tanks which are filled directly from delivery tankers.

Bulk storage tanks are provided as follows;

Data centre LD 4, 2 tanks of 55,000 litres each.

Data centre LD 5, 3 tanks of 66,000 litres each.

Data centre LD 6, 3 tanks of 80,000 litres each.

Data centre LD 7, 3 tanks of 81,000 litres each

Data centre LD10, 3 tanks of 47,600 litres each.

All tanks are fitted with overfill alarms and are housed within bunded enclosures equipped with leakage alarms.

The site is covered in hardstanding and surface water gullies drain into an oil interceptor prior to discharge from site. There is no sewer connection related to the process.

The standby generators are designed and configured so that in the event of a mains failure all the generators will fire up then subsequently ramp down to meet the load at the site. All the generators are subject to a maintenance testing schedule.

The Campus is located on the Slough Trading Estate, owned and managed by SEGRO plc. Equinix operate five data centres on the trading estate, all of which are included within this permit.

The surrounding area is a mix of industrial, commercial and residential uses.

Air Quality

The primary pollutant of concern to air quality is nitrogen dioxide (NO₂) resulting from the combustion process on site. The Applicant has submitted an air dispersion modelling report which assesses the potential impact of emission of NO₂ from the generators on local air quality.

The data centre is not situated in an Air Quality Management Area (AQMA) and there is one AQMA within 2km of the site. The Slough AQMA no 1 along the M4 lies approximately 1.5 km from the site. The local authority were consulted and their response is given below in the Consultation section.

Our Air Quality Modelling and Assessment Unit (AQMAU) audited the air dispersion modelling and report submitted with the permit application. Both the maintenance testing and emergency scenarios within the modelling were assessed.

Maintenance testing

The applicant has modelled continuous operation for the maintenance scenario which is a worst case approach.

The Predicted Environmental Concentration (PEC) exceeds 100% of the short-term human health and ecological Environmental Quality Standards (EQSs) at a number of receptor locations and therefore further investigation was required to look at the actual likelihood of the process resulting in a breach of the EQSs. The Applicant completed statistical analysis to determine the likelihood of the worst predicted emissions coinciding with the worst meteorological years, and subsequently causing a breach of the short-term EQSs. The approach followed the approach set out in the following report '[Diesel generator short term NO2 impact](#)

[assessment](#)' dated 01/11/2016 to calculate the likelihood. The results show that there is a negligible risk of the process resulting in an exceedence of the EQSs and we agree with this conclusion.

Improvement condition IC4 is specified in the permit which requires the operator to produce a report outlining the details of the annual maintenance operating regime following the first year of operation following permitting to validate the information provided with the permit application.

Emergency scenario

Although the site has operated for approximately 8 years without being required to operate in emergency mode, the air quality modelling does indicate that the emergency outage operating scenario could pose a risk to local air quality and identified receptors for short term NO₂. As a result, improvement condition IC6 requires the Operator to submit a review of options for reducing predicted short term nitrogen dioxide emissions impacts for the grid failure emergency scenario. Improvement condition IC3 requires the production of an Air Quality Management Plan.

The EA has specified that the operator shall have a written action plan to manage the issue for prolonged emergency running of the plant (including sensitive receptors list and mitigations, assessments and impacts evaluation against modelled risk conditions i.e. occurrence at periods of most concern in the year, possibly ambient air monitoring surveillance at very sensitive receptors). This needs to be proportionate to the level of risk at the receptors. The operator is expected to work with the local authority to develop this plan to ensure local factors are fully considered.

Improvement condition IC6 requires the Operator to submit a review of options for reducing predicted short term nitrogen dioxide emissions impacts for the grid failure emergency scenario – see section on BAT below for further information.

We have also specified improvement condition IC5 requiring the operator to determine the actual short term NO_x concentrations at the site boundary through monitoring to contribute to the validation of conclusions reached in the air quality assessment within the application and to inform the air quality management plan.

Permit conditions

The permit will include a maximum 500 hour 'emergency/standby operational limit' for any or all the plant producing on-site power under the limits of the combustion activity; and thereby emission limit values ELVs to air (and thus engine emissions monitoring) are not required within the permit. Emergency hours' operation includes those unplanned hours required to come off grid to make emergency repair of electrical infrastructure associated but occurring only within the data centre itself.

Each individual generator with its own discharge stack, can be maintained, tested and used in a planned way without ELVs or associated monitoring under IED/MCPD. Though clearly the EA expects planned testing and generator operations to be organised to minimise occasions and durations (subject to client requirements).

The permit has a limit on the activity to exclude voluntary 'elective power operation' such as demand side response (i.e. on-site use) or grid short term operating reserve (STOR) (i.e. off-site export of electricity) and Frequency Control by Demand Management (FCDM) for grid support. This is primarily to differentiate data centres from 'diesel arrays' that voluntarily operate within the balancing market, and importantly a clear way to demonstrate minimisation of emissions to air as 'Emergency plant'.

Operations and management procedures should reflect the outcomes of the air quality modelling by minimising the duration of testing, phasing engines into subgroups, avoiding whole site tests and planning off-grid maintenance days and most importantly times/days to avoid adding to "at risk" high ambient pollutant background levels.

The permit application must assess and provide evidence of actual reliability data for the local electricity grid distribution (including data centre internal electrical design) for the EA to judge the realistic likelihood of the plant needing to operate for prolonged periods in an emergency mode (especially if emissions model so as to exceed short term air quality standards).

Reporting of standby engine maintenance run hours is required annually and any electrical outages (planned or grid failures regardless of duration) requires both immediate notification of the Environment Agency and annual reporting.

The default generator specification as a minimum for new plant to minimise the impacts of emissions to air (NO_x) is 2g TA-Luft (or equivalent standard) or an equivalent NO_x emission concentration of 2000mg/m³. The generator specifications on the site have emissions significantly higher than this. The BAT assessment attributed this to the generators being on site when it was purchased. We do acknowledge that it would not be practicable to require the operator at this stage to upgrade all plant to BAT standards. However upgrade of some plant could be considered as part of the requirement to reduce short term nitrogen dioxide outlined in improvement condition IC6.

Retrofit abatement techniques for existing installations for engine emissions such as selective catalytic reduction (SCR) would not normally be expected for standby plant to mitigate the emissions for standby/emergency operation. The Applicant confirmed that they will carry out further investigation into reductions in short term NO_x and may consider options such as changes to operational control of the plant, modifications to the flue gas dispersion or installation of reduction equipment. Options such as this will need to be considered further through the response to improvement condition IC6.

Noise

The generators are either located inside buildings or within acoustic enclosures. There are no proximate noise sensitive receptors and there have been no complaints of noise during the time the data centres have been in operation.

The Environment Agency Qualitative Noise Screening Assessment Tool has been used and assessed that a Noise Impact Assessment and Noise Management Plan were not required.

The permit contains a standard condition (3.4) which states: "Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency". And "if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to noise and vibration, submit to the Environment Agency for approval within the period specified, a noise and vibration management plan which identifies and minimises the risks of pollution from noise and vibration".

BAT

We accept that oil fired diesel generators are presently a commonly used technology for standby generators in data centres. However we requested a BAT assessment detailing the choice of engine, the particular configuration and plant sizing meeting the standby arrangement.

The default generator specification as a minimum for new plant to minimise the impacts of emissions to air (NO_x) is 2g TA-Luft (or equivalent standard) or an equivalent NO_x emission concentration of 2000mg/m³. Some of the generator specifications on the site have emissions significantly higher than this. The BAT assessment attributed this to the generators being on site when it was purchased. We do acknowledge that it would not be practicable to require the operator at this stage to upgrade all plant to BAT standards. However upgrade of some plant could be considered as part of the requirement to reduce short term nitrogen dioxide outlined in improvement condition IC6.

Retrofit abatement techniques for existing installations for engine emissions such as selective catalytic reduction (SCR) would not normally be expected for standby plant to mitigate the emissions for standby/emergency operation. The Applicant confirmed that they will carry out further investigation into reductions in short term NO_x and may consider options such as changes to operational control of the plant, modifications to the flue gas dispersion or installation of reduction equipment. Options such as this will need to be considered further through the response to improvement condition IC6. The operator has committed to install 2g TA-Luft engines as part of any future replacement programme.

The data centres each have 2 separate substation feeds in order that power supply has a good level of redundancy. The data centres are protected from short-term brown-outs or black-outs by uninterruptable

power supplies (UPSs). These buffer small fluctuations in electrical supply. If the UPS detects power failure or extended reduced power, the generators within the data centres affected will start automatically to begin generating sufficient electricity to match the load required by the data centre. The UPS can supply power for a minimum of six minutes but ordinarily the generators would kick in well before this time elapses.

Protection of Groundwater

There are no fugitive emissions to land or groundwater from any of the data centres on the Campus. The generators are located in all cases over hard-standing. In the case of LD6 and LD7 the generators are located inside the data centre building on poured concrete flooring.

Externally, each Site consists of hard standing in good condition both inside and outside of the buildings. Diesel, hazardous waste and hazardous materials storage is bunded and/or indoors, such that any source of potential contamination is prevented from discharge to land.

Bulk fuel tanks are fully-bunded to 110% of their volume. The day tanks are double skinned. The majority are under cover and not subject to rainwater incursion. Those that are outside have a means of removing rainwater from the bund that does not penetrate the bund wall. Any oil and oily water will be removed using a vacuum pump, and recycled or disposed using an appropriate waste disposal company.

Equinix has emergency response procedures in place in the event of a release of oil or diesel, processes for the planning for such eventualities and checklists to audit the response in case such an event occurs. Rainwater is kept separate from any areas in which there may be any potential contaminants and is allowed to run off to the surface water drainage serving the trading estate.

Drainage drawings for each of the sites are provided in the application.

Details of the existing condition of the Sites can be found in their respective Site Condition Reports,

Environmental Risk

We have reviewed the operator's assessment of the environmental risk from the facility.

The operator's risk assessment is satisfactory.

The assessment shows that, applying the conservative criteria in our guidance on environmental risk assessment, all emissions may be categorised as environmentally insignificant with the exception of short term emissions of NO₂ during testing and emergency operation.

For the three testing scenarios, the Environment Agency audit agrees with the applicants conclusions.

Predicted Environmental Concentrations (PECs) could exceed the ST NO₂ Environmental Standard (ES) at human receptors. The maximum number of hours of exceedances is 54 hours in a year.

The probability of breaching the hourly NO₂ ES is 0.75%, and therefore highly unlikely.

NO_x, nutrient nitrogen and acid deposition impacts are insignificant for protected conservation areas.

With regards to emergency operations:

Exceedances are unlikely provided emergency operations do not occur more than 18 hours per year.

Exceedances of the AEGL-1 for NO₂ over 10 minutes, 30 minutes and 1 hour periods at public exposure locations. Indicating an air quality incident level event under emergency operations.

Provided that power outages do not occur, exceedances are unlikely. In the last nine years none of the data centres have operated for emergency power generation.

Decision checklist

Aspect considered	Decision
Receipt of application	
Confidential information	A claim for commercial or industrial confidentiality has not been made.
Identifying confidential information	We have not identified information provided as part of the application that we consider to be confidential. The decision was taken in accordance with our guidance on confidentiality.
Consultation	
Consultation	<p>The consultation requirements were identified in accordance with the Environmental Permitting Regulations and our public participation statement. The application was publicised on the GOV.UK website.</p> <p>We consulted the following organisations:</p> <ul style="list-style-type: none"> Buckinghamshire Fire and Rescue Health and safety executive Public Health England Food standards Agency Local Planning Authority-Slough Director of Public Health-Slough Environmental Health-Slough <p>The comments and our responses are summarised in the consultation section.</p>
Operator	
Control of the facility	We are satisfied that the applicant (now the operator) is the person who will have control over the operation of the facility after the grant of the permit. The decision was taken in accordance with our guidance on legal operator for environmental permits.
The facility	
The regulated facility	<p>We considered the extent and nature of the facility at the site in accordance with RGN2 'Understanding the meaning of regulated facility', Appendix 2 of RGN 2 'Defining the scope of the installation', Appendix 1 of RGN 2 'Interpretation of Schedule 1', guidance on waste recovery plans and permits.</p> <p>The extent of the facility is defined in the site plan and in the permit. The activities are defined in table S1.1 of the permit.</p>
The site	
Extent of the site of the facility	The operator has provided plans which we consider are satisfactory, showing the extent of the site of the facility. The plan is included in the permit.
Site condition report	The operator has provided a description of the condition of the site, which we consider is satisfactory. The decision was taken in accordance with our guidance on site condition reports.

Aspect considered	Decision
Biodiversity, heritage, landscape and nature conservation	<p>The application is within the relevant distance criteria of a site of heritage, landscape or nature conservation, and/or protected species or habitat.</p> <p>We have assessed the application and its potential to affect all known sites of nature conservation, landscape and heritage and/or protected species or habitats identified in the nature conservation screening report as part of the permitting process.</p> <p>We consider that the application will not affect any sites of nature conservation, landscape and heritage, and/or protected species or habitats identified.</p> <p>We have not consulted Natural England on the application. The decision was taken in accordance with our guidance.</p> <p>We have sent an Appendix 11 to Natural England for information only. The decision was taken in accordance with our guidance. An Appendix 4 was saved to our electronic document records management system (EDRM) for audit purposes only.</p>
Environmental risk assessment	
Environmental risk	<p>We have reviewed the operator's assessment of the environmental risk from the facility.</p> <p>The operator's risk assessment is satisfactory.</p> <p>The assessment shows that, applying the conservative criteria in our guidance on environmental risk assessment, all emissions may be categorised as environmentally insignificant with the exception of short term emissions of NO₂ during testing and emergency operation.</p> <p>For the three testing scenarios, the Environment Agency audit agrees with the applicants conclusions.</p> <p>Predicted Environmental Concentrations (PECs) could exceed the ST NO₂ Environmental Standard (ES) at human receptors. The maximum number of hours of exceedances is 54 hours in a year.</p> <p>The probability of breaching the hourly NO₂ ES is 0.75%, and therefore highly unlikely.</p> <p>NO_x, nutrient nitrogen and acid deposition impacts are insignificant for protected conservation areas.</p> <p>With regards to emergency operations:</p> <p>Exceedances are unlikely provided emergency operations do not occur more than 18 hours per year.</p> <p>Exceedances of the AEGL-1 for NO₂ over 10 minutes, 30 minutes and 1 hour periods at public exposure locations. Indicating an air quality incident level event under emergency operations.</p> <p>Provided that power outages do not occur, exceedances are unlikely. In the last nine years none of the data centres have operated for emergency power generation.</p>
Operating techniques	
General operating techniques	<p>We have reviewed the techniques used by the operator and compared these with the relevant guidance notes and we consider them to represent appropriate techniques for the facility.</p> <p>The operating techniques that the applicant must use are specified in table S1.2 in the environmental permit.</p>

Aspect considered	Decision
Permit conditions	
Use of conditions other than those from the template	Based on the information in the application, we consider that we do not need to impose conditions other than those in our permit template.
Raw materials	We have specified limits and controls on the use of raw materials and fuels.
Improvement programme	<p>Based on the information on the application, we consider that we need to impose an improvement programme.</p> <p>We have imposed an improvement programme to ensure that the operator:</p> <ul style="list-style-type: none"> Completes the programme of installing vertical exhausts in LD10 and carries out a feasibility study for vertical exhausts in LD6. Produces an Air Quality Management Plan Produces a report on the first year maintenance and operating regime identifying means of minimising emissions. Carries out an ambient monitoring exercise to verify the short term NO2 concentrations at the site boundary. Submits a review of options for reducing short term NO2 impacts.
Emission limits	We have decided that emission limits are not required in the permit.
Reporting	We have specified reporting in the permit to ensure that the installation is being operated in line with that specified in the operating techniques and to ensure that we are notified immediately in the instance that the site ever operated in emergency scenario mode.
Operator competence	
Management system	<p>There is no known reason to consider that the operator will not have the management system to enable it to comply with the permit conditions.</p> <p>The decision was taken in accordance with the guidance on operator competence and how to develop a management system for environmental permits.</p>
Financial competence	There is no known reason to consider that the operator will not be financially able to comply with the permit conditions.
Growth Duty	
Section 108 Deregulation Act 2015 – Growth duty	<p>We have considered our duty to have regard to the desirability of promoting economic growth set out in section 108(1) of the Deregulation Act 2015 and the guidance issued under section 110 of that Act in deciding whether to grant this permit.</p> <p>Paragraph 1.3 of the guidance says:</p> <p>“The primary role of regulators, in delivering regulation, is to achieve the regulatory outcomes for which they are responsible. For a number of regulators, these regulatory outcomes include an explicit reference to development or growth. The growth duty establishes economic growth as a factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation.”</p> <p>We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document</p>

Aspect considered	Decision
	<p>above. The guidance is clear at paragraph 1.5 that the growth duty does not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.</p> <p>We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.</p>

Consultation

The following summarises the responses to consultation with other organisations, our notice on GOV.UK for the public and the way in which we have considered these in the determination process.

Responses from organisations listed in the consultation section

Response received from
Public Health England
Brief summary of issues raised
Based on the information contained in the application supplied to us, Public Health England has no significant concerns regarding the risk to the health of the local population from the installation. This consultation response is based on the assumption that the permit holder shall take all appropriate measures to prevent or control pollution, in accordance with the relevant sector guidance and industry best practice.
Summary of actions taken or show how this has been covered
No action required

Response received from
Local Planning Authority-Slough
Brief summary of issues raised
The Council has assessed the air quality and noise impacts and is satisfied that the assessments were undertaken. There is no objection to the environmental permit being granted.
Summary of actions taken or show how this has been covered
No action required

Representations from local MP, councillors and parish/town community councils

None received

Representations from community and other organisations

None received

Representations from individual members of the public.

None received