

Permit with introductory note

The Environmental Permitting (England & Wales) Regulations 2016

NTT Global Data Centers EMEA UK Limited

Hemel Hempstead Data Centres

Campus, Spring Way,
Hemel Hempstead, HP2 7UP

Centro, 3 Boundary Way,
Hemel Hempstead, HP2 7SU

Maylands, 150 Maylands Avenue,
Hemel Hempstead, HP2 7DF

Hemel Hempstead 4 (HH4) (Phase 1), Prologis Park,
Hemel Hempstead, HP2 7EQ

Permit number

EPR/BP3800PZ

Hemel Hempstead Data Centres

Permit number EPR/BP3800PZ

Introductory note

This introductory note does not form a part of the permit

The main features of the permit are as follows.

This permit authorises the operation of four individual data centres operated by NTT Global Data Centers EMEA UK Limited north-east of Hemel Hempstead town centre within this single permit. These are regulated as a Schedule 1 Part A(1) 1.1(a) 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).

These data centres and their total thermal input are:

- Campus Data Centre, Spring Way, Hemel Hempstead, HP2 7UP:
 - o 2 MTU X1000 generators each with thermal input of 2.49 MWth;
 - o 13 Kohler KD1800 generators each with thermal input of 4.1 MWth;
 - o 16 MTU X1850 generators each with thermal input of 4.14 MWth.(31 generators in total with total thermal input of 124.52 MWth).
- Centro Data Centre, 3 Boundary Way, Hemel Hempstead, HP2 7SU:
 - o 4 MTU X1000 generators each with thermal input of 2.49 MWth.(4 generators in total with total thermal input of 9.96 MWth).
- Maylands Data Centre, 150 Maylands Avenue, Hemel Hempstead, HP2 7DF:
 - o 4 MTU X1000 generators each with thermal input of 2.49 MWth;
 - o 10 MTU 2200 generators each with thermal input of 4.98 MWth.(14 generators with total thermal input of 59.76 MWth).
- Hemel Hempstead 4 (HH4) Data Centre (Phase 1), Prologis Park, Hemel Hempstead, HP2 7EQ:
 - o 15 Kohler T2500 generators each with thermal input of 4.76 MWth.(15 generators with total thermal input of 71.4 MWth).

A further 15 generators (with total thermal input of 71.4 MWth) are scheduled to be installed at HH4 Data Centre in phase 2 but these are not included within this permit.

At the time of permit application, Campus, Centro and Maylands sites were operational. The HH4 site was under construction.

Although we do not consider them to be “one site”, we have chosen in this instance to include all four NTT Hemel Hempstead data centres in the one permit because:

- The individual permitted activities are the operation of the generators at the data centres and they will therefore only run in very limited circumstances;
- When they do run, the sites share sensitive receptors and the air dispersion modelling shows there is an overlap in impacts so we consider there are environmental benefits to us taking this approach in this instance.
- We consider some of the data centres ‘one site’ (Campus and Centro) and we don’t consider the addition of the other ones to be a significant addition of regulatory input for us due to their limited operation.

We have decided on this method of permitting these sites for the reasons given above. This approach is not applicable to other permitting sectors.

The data centre generators will only operate under a limited scheduled programme of routine testing and maintenance or in an emergency site power outage scenario. Electrical power is normally provided to the data centres from the National Grid. However, in the event of a failure in this electrical supply, the operator will utilise the generators to maintain an electrical power supply to the site. The generators will be used solely for the purpose for generating power for the facility. No electricity will be exported from the installation.

Diesel fuel for the generators is stored in belly tanks located under each generator. The Centro and Maylands sites also have above ground bulk diesel storage tanks.

The total capacity of diesel that can be stored at each site (including belly tanks and bulk storage tanks) is:

- Campus	881,000 litres;
- Centro	78,366 litres;
- Maylands	283,360 litres;
- HH4 (Phase 1)	600,000 litres.
- Total stored fuel	1,842,726 litres

There is a contractual agreement with the data owners that each of the four data centres must have diesel storage capacity on site to allow 36 hours of generator operation in the event of National Grid failure.

The belly tanks at Maylands (Suite 1 generators only) and Centro data centres are filled directly from the bulk storage diesel tanks located on these sites. For the Maylands data centre (with the exception of Suite 1 generators), Campus and HH4 (phase 1) data centres, the belly tanks are filled directly from refuelling vehicles. Fuel is delivered directly to the belly tanks via fill points which are located on the generator container units. These are positioned in lockable cabinets which are designed with drip trays.

The operation of the data centre diesel generators does not result in the generation of trade effluent.

The drainage to foul sewer at the four data centre sites consists of only sanitary foul water (sinks, toilets, cleaning water etc.) which is not regulated through this permit.

All surface water run-off at the four data centre sites is directed to the site surface water drainage system which is fitted with oil interceptors except for the Centro data centre whose run-off is discharged directly to the surface water drainage system without passing through an on-site oil interceptor. The site surface water drainage system is discharged to the municipal surface water drainage system. Only the interceptor at the newest HH4 (phase 1) site will alarm if oil is present. All interceptors will be emptied, cleaned and maintained at least annually by an appointed specialist contractor.

There are no discharges to foul sewer within the plant areas on each datacentre site where the generators and diesel storage are located. All run-off from these areas drains to the site-specific surface water drainage systems prior to off-site discharge into the municipal sewer system. The surface water drainage system at each of the datacentres will accept surface water runoff from the areas where the generator container units and associated diesel storage are located, along with water from the building roof area and other hard surfaced areas of the site.

The location in which the four data centres are situated is a mix of commercial, industrial, agricultural and recreational land with residential properties, woodland, playing fields, allotments and a cemetery close by.

The closest residential properties to any of the four data centres are approximately 115 m north-west of the HH4 (phase 1) site.

The sites are located approximately 7.5 km south-east of Chilterns Beechwoods Special Area of Conservation (SAC). There are a number of Local Wildlife Sites, Local Nature Reserves and Ancient Woodlands within 2 km of the four data centres.

The status log of the permit sets out the permitting history, including any changes to the permit reference number.

Status log of the permit		
Description	Date	Comments
Application EPR/BP3800PZ/A001	Duly made 14/01/21	Application for operating up to 64 standby diesel-powered generators at four close data centre locations within Hemel Hempstead.
Additional information received Response to Schedule 5 Notice dated 11/03/21	24/03/21	Additional information received on: <ul style="list-style-type: none"> - Permitting the four data centres in a single permit. - Emissions to air and gaseous dispersion. - Best Available Techniques justification. - Bunding and containment. - Surface water management and discharge. - Resilience of the data centres to national grid outage. - Accident management (including climate change adaptation). - Maintenance, inspection and testing. - Site Condition Report. - Noise.
Additional information received	19/05/21, 20/05/21, 24/05/21, 01/06/21, 13/07/21, 22/07/21, 03/08/21, 01/10/21, 11/10/21 and 16/11/21.	Response to requests for further information dated 19/05/21, 21/05/21, 28/06/21, 21/07/21, 30/07/21, 06/08/21, 12/08/21 and 03/11/21 on: <ul style="list-style-type: none"> - The operating company for NTT data centres. - The design specification for belly tanks. - The version of Environment Agency FAQ Guidance used in the application. - The environmental impact at ecological receptors. - The generator specifications and NOx emissions. - Data files for revised air dispersion modelling. - Air quality assessment against international standards. - Operation of standby engines during periods related to neither maintenance/testing nor emergency outage scenarios. - Site plans for individual data centres. - Management of surface water discharges. - Monitoring of fuel levels in belly tanks and above ground storage tanks.
Additional information received	14/09/21 and 20/09/21	Additional information received on a revised reconfiguration of HH4 data centre and the risk assessment for operation of only HH4 phase 1.
Additional information received	16/12/21	Additional information received on the dates of installation of generators at Campus, Centro and Maylands sites.
Permit determined EPR/BP3800PZ (PAS Billing ref. BP3800PZ)	17/12/21	Permit issued to NTT Global Data Centers EMEA UK Limited.

End of introductory note

Permit

The Environmental Permitting (England and Wales) Regulations 2016

Permit number

EPR/BP3800PZ

The Environment Agency hereby authorises, under regulation 13 of the Environmental Permitting (England and Wales) Regulations 2016

NTT Global Data Centers EMEA UK Limited (“the operator”),

whose registered office is

**3 Centro Boundary Way,
Hemel Hempstead
Hertfordshire
HP2 7SU**

company registration number 04239332

to operate an installation at

Hemel Hempstead Data Centres

**Campus, Spring Way,
Hemel Hempstead, HP2 7UP**

**Centro, 3 Boundary Way,
Hemel Hempstead, HP2 7SU**

**Maylands, 150 Maylands Avenue,
Hemel Hempstead, HP2 7DF**

**Hemel Hempstead 4 (HH4) (Phase 1), Prologis Park,
Hemel Hempstead, HP2 7EQ**

to the extent authorised by and subject to the conditions of this permit.

Name	Date
David Griffiths	17/12/2021

Authorised on behalf of the Environment Agency

Conditions

1 Management

1.1 General management

1.1.1 The operator shall manage and operate the activities:

- a) in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints; and
- b) using sufficient competent persons and resources.

1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.

1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of it kept at or near the place where those duties are carried out.

1.2 Energy efficiency

1.2.1 The operator shall:

- a) take appropriate measures to ensure that energy is used efficiently in the activities;
- b) review and record at least every four years whether there are suitable opportunities to improve the energy efficiency of the activities; and
- c) take any further appropriate measures identified by a review.

1.3 Efficient use of raw materials

1.3.1 The operator shall:

- a) take appropriate measures to ensure that raw materials and water are used efficiently in the activities;
- b) maintain records of raw materials and water used in the activities;
- c) review and record at least every four years whether there are suitable alternative materials that could reduce environmental impact or opportunities to improve the efficiency of raw material and water use; and
- d) take any further appropriate measures identified by a review.

1.4 Avoidance, recovery and disposal of wastes produced by the activities

1.4.1 The operator shall take appropriate measures to ensure that:

- a) the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste by the activities; and
- b) any waste generated by the activities is treated in accordance with the waste hierarchy referred to in Article 4 of the Waste Framework Directive; and
- c) where disposal is necessary, this is undertaken in a manner which minimises its impact on the environment.

- 1.4.2 The operator shall review and record at least every four years whether changes to those measures should be made and take any further appropriate measures identified by a review.

1.5 Climate change

- 1.5.1 The operator shall review and if appropriate update, at least every 4 years, the climate change adaptation risk assessment submitted with the permit application, and shall update the written management system as appropriate.

2 Operations

2.1 Permitted activities

- 2.1.1 The operator is only authorised to carry out the activities specified in schedule 1 table S1.1 (the "activities").

2.2 The site

- 2.2.1 The activities shall not extend beyond the sites, being the land shown edged in green on the site plans at schedule 7 to this permit.

2.3 Operating techniques

- 2.3.1 The activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1, table S1.2, unless otherwise agreed in writing by the Environment Agency.
- 2.3.2 If notified by the Environment Agency that the activities are giving rise to pollution, the operator shall submit to the Environment Agency for approval within the period specified, a revision of any plan or other documentation ("plan") specified in schedule 1, table S1.2 or otherwise required under this permit which identifies and minimises the risks of pollution relevant to that plan, and shall implement the approved revised plan in place of the original from the date of approval, unless otherwise agreed in writing by the Environment Agency.
- 2.3.3 For the following activities referenced in schedule 1, table S1.1, AR1, The activities shall not operate for more than 500 hours in emergency use per annum.
- 2.3.4 Any raw materials or fuels listed in schedule 2 table S2.1 shall conform to the specifications set out in that table.
- 2.3.5 The operator shall ensure that where waste produced by the activities is sent to a relevant waste operation, that operation is provided with the following information, prior to the receipt of the waste:
- a) the nature of the process producing the waste;
 - b) the composition of the waste;
 - c) the handling requirements of the waste;
 - d) the hazardous property associated with the waste, if applicable; and
 - e) the waste code of the waste.
- 2.3.6 The operator shall ensure that where waste produced by the activities is sent to a landfill site, it meets the waste acceptance criteria for that landfill.

2.4 Improvement programme

- 2.4.1 The operator shall complete the improvements specified in schedule 1 table S1.3 by the date specified in that table unless otherwise agreed in writing by the Environment Agency.
- 2.4.2 Except in the case of an improvement which consists only of a submission to the Environment Agency, the operator shall notify the Environment Agency within 14 days of completion of each improvement.

3 Emissions and monitoring

3.1 Emissions to water, air or land

- 3.1.1 There shall be no point source emissions to water, air or land except from the sources and emission points listed in schedule 3 tables S3.1 and S3.2.
- 3.1.2 Periodic monitoring shall be carried out at least once every 5 years for groundwater and 10 years for soil, unless such monitoring is based on a systematic appraisal of the risk of contamination.

3.2 Emissions of substances not controlled by emission limits

- 3.2.1 Emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions.
- 3.2.2 The operator shall:
- a) if notified by the Environment Agency that the activities are giving rise to pollution, submit to the Environment Agency for approval within the period specified, an emissions management plan which identifies and minimises the risks of pollution from emissions of substances not controlled by emission limits;
 - b) implement the approved emissions management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.
- 3.2.3 All liquids in containers, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.

3.3 Odour

- 3.3.1 Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where that is not practicable to minimise the odour.
- 3.3.2 The operator shall:
- a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to odour, submit to the Environment Agency for approval within the period specified, an odour management plan which identifies and minimises the risks of pollution from odour;
 - b) implement the approved odour management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.4 Noise and vibration

- 3.4.1 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, unless the operator

has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan to prevent or where that is not practicable to minimise the noise and vibration.

3.4.2 The operator shall:

- a) 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;
- b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.5 Monitoring

3.5.1 The operator shall, unless otherwise agreed in writing by the Environment Agency, undertake the monitoring specified in the following tables in schedule 3 to this permit:

- a) point source emissions specified in tables S3.1 and S3.2.

3.5.2 The operator shall maintain records of all monitoring required by this permit including records of the taking and analysis of samples, instrument measurements (periodic and continual), calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data.

3.5.3 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme and the environmental or other monitoring specified in condition 3.5.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate) unless otherwise agreed in writing by the Environment Agency.

3.5.4 Permanent means of access shall be provided to enable sampling/monitoring to be carried out in relation to the emission points specified in schedule 3 tables S3.1 and S3.2 unless otherwise agreed in writing by the Environment Agency.

4 Information

4.1 Records

4.1.1 All records required to be made by this permit shall:

- a) be legible;
- b) be made as soon as reasonably practicable;
- c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and
- d) be retained, unless otherwise agreed in writing by the Environment Agency, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:
 - (i) off-site environmental effects; and
 - (ii) matters which affect the condition of the land and groundwater.

4.1.2 The operator shall keep on site all records, plans and the management system required to be maintained by this permit, unless otherwise agreed in writing by the Environment Agency.

4.2 Reporting

- 4.2.1 The operator shall send all reports and notifications required by the permit to the Environment Agency using the contact details supplied in writing by the Environment Agency.
- 4.2.2 A report or reports on the performance of the activities over the previous year shall be submitted to the Environment Agency by 31 January (or other date agreed in writing by the Environment Agency) each year. The report(s) shall include as a minimum:
- a) a review of the results of the monitoring and assessment carried out in accordance with the permit including an interpretive review of that data;
 - b) the annual production/treatment data set out in schedule 4 table S4.2; and
 - c) the performance parameters set out in schedule 4 table S4.3 using the forms specified in table S4.4 of that schedule.
- 4.2.3 Within 28 days of the end of the reporting period the operator shall, unless otherwise agreed in writing by the Environment Agency, submit reports of the monitoring and assessment carried out in accordance with the conditions of this permit, as follows:
- a) in respect of the parameters and emission points specified in schedule 4 table S4.1;
 - b) for the reporting periods specified in schedule 4 table S4.1 and using the forms specified in schedule 4 table S4.4; and
 - c) giving the information from such results and assessments as may be required by the forms specified in those tables.
- 4.2.4 The operator shall, unless notice under this condition has been served within the preceding four years, submit to the Environment Agency, within six months of receipt of a written notice, a report assessing whether there are other appropriate measures that could be taken to prevent, or where that is not practicable, to minimise pollution.

4.3 Notifications

- 4.3.1 In the event:
- a) that the operation of the activities gives rise to an incident or accident which significantly affects or may significantly affect the environment, the operator must immediately—
 - (i) inform the Environment Agency,
 - (ii) take the measures necessary to limit the environmental consequences of such an incident or accident, and
 - (iii) take the measures necessary to prevent further possible incidents or accidents;
 - b) of a breach of any permit condition the operator must immediately—
 - (i) inform the Environment Agency, and
 - (ii) take the measures necessary to ensure that compliance is restored within the shortest possible time;
 - c) of a breach of permit condition which poses an immediate danger to human health or threatens to cause an immediate significant adverse effect on the environment, the operator must immediately suspend the operation of the activities or the relevant part of it until compliance with the permit conditions has been restored.
- 4.3.2 Any information provided under condition 4.3.1 shall be confirmed by sending the information listed in schedule 5 to this permit within the time period specified in that schedule.
- 4.3.3 Where the Environment Agency has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Environment Agency when the

relevant monitoring and/or spot sampling is to take place. The operator shall provide this information to the Environment Agency at least 14 days before the date the monitoring is to be undertaken.

4.3.4 The Environment Agency shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:

Where the operator is a registered company:

- a) any change in the operator's trading name, registered name or registered office address; and
- b) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

Where the operator is a corporate body other than a registered company:

- c) any change in the operator's name or address; and
- d) any steps taken with a view to the dissolution of the operator.

In any other case:

- e) the death of any of the named operators (where the operator consists of more than one named individual);
- f) any change in the operator's name(s) or address(es); and
- g) any steps taken with a view to the operator, or any one of them, going into bankruptcy, entering into a composition or arrangement with creditors, or, in the case of them being in a partnership, dissolving the partnership.

4.3.5 Where the operator proposes to make a change in the nature or functioning, or an extension of the activities, which may have consequences for the environment and the change is not otherwise the subject of an application for approval under the Regulations or this permit:

- a) the Environment Agency shall be notified at least 14 days before making the change; and
- b) the notification shall contain a description of the proposed change in operation.

4.3.6 The Environment Agency shall be given at least 14 days notice before implementation of any part of the site closure plan.

4.3.7 Where the operator has entered into a climate change agreement with the Government, the Environment Agency shall be notified within one month of:

- a) a decision by the Secretary of State not to re-certify the agreement;
- b) a decision by either the operator or the Secretary of State to terminate the agreement; and
- c) any subsequent decision by the Secretary of State to re-certify such an agreement.

4.4 Interpretation

4.4.1 In this permit the expressions listed in schedule 6 shall have the meaning given in that schedule.

4.4.2 In this permit references to reports and notifications mean written reports and notifications, except where reference is made to notification being made "immediately", in which case it may be provided by telephone.

Schedule 1 – Operations

Table S1.1 activities			
Activity reference	Activity listed in Schedule 1 of the EP Regulations	Description of specified activity	Limits of specified activity
AR1	Section 1.1 A (1) (a): Burning any fuel in an appliance with a rated thermal input of 50 megawatts or more.	<p>Operation of 64 emergency standby generators across four sites with a total thermal input of approximately 265.64 MWth.</p> <p>The generators will burn diesel solely in order to provide electricity to the installation in the event of a failure of the National Grid electricity supply and during maintenance/testing</p> <p>The standby emergency generators comprise:</p> <p>Campus Data Centre</p> <ul style="list-style-type: none"> - 31 generators with a total thermal rated input of 124.52 MWth; <p>Centro Data Centre</p> <ul style="list-style-type: none"> - 4 generators with a total thermal rated input of 9.96 MWth; <p>Maylands Data Centre</p> <ul style="list-style-type: none"> - 14 generators with a total thermal rated input of 59.76 MWth; <p>HH4 (Phase 1) Data Centre</p> <ul style="list-style-type: none"> - 15 generators with a total thermal rated input of 71.4 MWth. 	<p>From receipt of raw materials and generation of electricity to despatch of waste.</p> <p>Electricity produced at the installation cannot be exported to the National Grid.</p> <p>The emergency operational hours of the installation shall not exceed the specifications set out in condition 2.3.3.</p>
Directly Associated Activity			
AR2	Storage of raw materials	From receipt of raw materials to use within the facility.	
AR3	Surface water drainage	Input to site drainage system until discharge off-site via oil/water interceptor (excluding Centro data centre site which has no interceptor).	

Table S1.2 Operating techniques		
Description	Parts	Date Received
Application	<p>Sections 4 – 11 of the application document, Best Available Techniques and Operating Techniques, provided in response to section 3a – technical standards in Part B3 of the application form.</p> <p>Sections 8 – 9 and Appendix 01 of the application document, Environmental Risk Assessment, provided in response to</p>	Duly Made 14/01/21

Table S1.2 Operating techniques		
Description	Parts	Date Received
	<p>section 3a – technical standards in Part B3 of the application form.</p> <p>Technical standards as described in Data Centre FAQ Headline Approach (v10, 01/06/18, Release to Industry.</p>	
<p>Response to Schedule 5 Notice dated 11/03/21.</p>	<p>Operating techniques described in the responses to the Notice (including accompanying information):</p> <ul style="list-style-type: none"> - Response to question 2 on site staffing (operational and maintenance); - Response to question 5 on checks and controls in place during routine testing/maintenance and emergency outage scenarios to prevent adverse impact on human health from generator emissions; - Response to question 10 on use of hinged covers on exhaust stacks at Centro site; - Response to question 12 on primary abatement measures on the combustion units; - Response to question 14 on the use of a larger number of smaller thermal input generators on all four data centre sites; - Response to question 15 on the filling of belly tanks with diesel and the actions to be taken in the event of loss of containment when offloading diesel; - Response to question 16 on the filling of above ground diesel storage tanks, the management of their diesel containment systems and inspection/maintenance systems; - Response to question 17 on the operation of spillage procedures; - Response to question 18 on the frequency and methods of inspections of underground rainwater harvesting and attenuation tanks to ensure their integrity; - Response to question 19 on prevention of diesel contamination of surface water run-off at Centro site which operates without an oil interceptor; - Response to questions 20, 21 and 25 on operation of data centre connection to the National Grid to ensure resilience in the event of Grid failures; - Response to question 22 on fire control within generator containment units; - Response to question 23 on preventing collision damage to generator containment units; - Response to question 24 on management of flood risk; - Response to question 26 on the automatic control of generator start-ups in the event of National Grid failure; - Response to question 27 on the integration and control of maintenance and testing regimes to ensure no more than two generators are in operation at the same time for these scenarios; - Response to questions 28 and 29 on infrastructure testing and maintenance procedures; - Response to question 32 on operation of generators to limit the impact of noise. 	<p>24/03/21</p>

Table S1.2 Operating techniques		
Description	Parts	Date Received
Additional information received	Operating techniques described in the responses to a request for further information (including accompanying information): - Operation of standby engines during periods related to neither maintenance/testing nor emergency outage scenarios.	03/08/21
Additional information received	Operating techniques described in the responses to a request for further information (including accompanying information): - Management of surface water discharges.	01/10/21 and 16/11/21
Additional information received	Operating techniques described in the responses to a request for further information (including accompanying information): - Monitoring of diesel levels in belly tanks and above ground storage tanks to detect a potential leak.	11/10/21
Additional information received	Operating techniques described in the responses to a request for further information (including accompanying information): - Sections 2 – 10 of Document “HH4 Data Centre Phase 1 Operation Risk Assessment”.	20/10/21

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC1	<p>The operator shall produce an Air Quality Management Plan in conjunction with the Local Authority outlining response measures to be taken in the event of a National Grid failure. This should include but not be limited to the following considerations:</p> <ul style="list-style-type: none"> • The response should be tailored to reflect the predicted potential impact indicated by the air dispersion modelling at individual receptors; • Preventative and reactive actions to be implemented to limit the duration of an outage event to less than 50 hours as far as possible; • Specific timescales for response measures; • How local conditions during a National Grid failure might influence the response required, for example meteorological conditions or time of day; • Contingency for how the response will be carried out in the event scenario i.e. loss of power; and • Timescales for continued review of the management plan. <p>The Air Quality Management Plan shall include consideration of grid outages which last less than 18 hours as potentially unacceptable acute exposure may occur to human health receptors because of generator operation for less than 18 hours.</p> <p>The agreed Air Quality Management Plan shall be submitted to the Environment Agency for written approval.</p>	30/06/2022
IC2	<p>The operator shall carry out a review of the tertiary containment systems which serve the diesel storage tanks (belly tanks and bulk storage tanks) at all four data centre sites.</p> <p>The review shall compare the design, method of construction and integrity of the systems against the standards outlined in CIRIA guidance C736 – Containment Systems for the Prevention of Pollution or an equivalent industry standard.</p>	28/02/2022

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
	<p>The review shall also consider:</p> <ul style="list-style-type: none"> - how any oil contaminated surface water at the permitted Campus site is prevented from discharge off-site via the unpermitted SW2 discharge location; - how any oil contaminated surface water at the Centro site is prevented from exiting site onto the adjacent area of unsurfaced land. <p>The review shall also consider whether additional spill protection equipment, revised procedures or additional training are required.</p> <p>A written report of the review shall be submitted to the Environment Agency for written approval which details:</p> <ul style="list-style-type: none"> • The review's findings and recommendations; • Proposals with timescales for the implementation of any recommended improvements. <p>The Operator shall implement any agreed improvements to the tertiary containment system within the timescales approved by the Environment Agency.</p>	
IC3	<p>The operator shall carry out an investigation into the possibility of installing an alarmed interceptor or the provision of alternative infrastructure to minimise the risk of discharge of diesel to the environment at the Centro data centre site.</p> <p>A written report of the review shall be submitted to the Environment Agency for written approval which details:</p> <ul style="list-style-type: none"> - The review's findings and recommendations; - Proposals with timescales for the implementation of any recommended improvements. <p>The Operator shall implement any agreed recommendations within the timescales approved by the Environment Agency.</p>	31/03/2022
IC4	<p>The operator shall submit to the Environment Agency for written approval:</p> <ul style="list-style-type: none"> - written procedures for the maintenance, inspection and testing of drains and interceptors present on all four data centre sites; - timescales for the implementation of these maintenance, inspection and testing procedures. <p>The operator shall implement the agreed procedures within the timescales approved by the Environment Agency.</p>	31/03/2022
IC5	<p>The operator shall submit to the Environment Agency for written approval:</p> <ul style="list-style-type: none"> - written procedures and timescales for the inspection of below ground storm water and rainwater attenuation tanks at Campus and HH4 (phase 1) data centre sites. <p>The operator shall demonstrate that these inspections are carried out by suitably qualified and experienced third party companies to ensure the integrity of the tanks or demonstrate that alternative inspection systems deliver an equivalent level of protection to these tanks.</p> <p>The operator shall implement the agreed procedures within the timescales approved by the Environment Agency.</p>	31/01/2022
IC6	<p>The operator shall submit to the Environment Agency for written approval a site investigation programme to obtain baseline soil and groundwater data for the Campus, Centro and Maylands data centre sites.</p> <p>The programme shall include:</p> <ul style="list-style-type: none"> - the location and nature of all sampling locations; - the analytical parameters for which testing will be carried out; - the commencement of the sampling and testing; - the timescales for any future sampling and testing. 	30/04/2022

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
	The operator shall carry out the sampling and testing to characterise baseline soil and groundwater data at these three data centre sites within the timescales approved by the Environment Agency.	
IC7	<p>The operator shall submit a report to the Environment Agency verifying the predicted short-term nitrogen oxides concentrations at the boundary of the sites. The report shall include but is not limited to:</p> <ul style="list-style-type: none"> • Monitoring of ambient air quality at the boundary of the site during the all the testing scenarios using monitoring methods agreed in advance with the Environment Agency • A comparison of modelled against monitored concentrations of nitrogen dioxide and nitrogen monoxide • A demonstration that appropriate monitoring location(s) were selected at the boundary of the site, taking into account the modelled predictions and the weather conditions prevalent at the time of the monitoring • Evidence to demonstrate that the monitoring team holds appropriate qualifications. <p>The output of the verification exercise should be used to inform / revise the air quality management plan if necessary.</p>	30/11/2022
IC8	<p>The operator shall submit to the Environment Agency for written approval a plan to reduce the predicted short term nitrogen dioxide and nitrogen monoxide emissions impact during the maintenance, testing and emergency operations of the standby generators. This shall include but is not limited to:</p> <ul style="list-style-type: none"> • Considerations of the conclusions of the validation exercise specified in improvement condition IC7 to inform a feasibility study including cost benefit analysis for upgrades or other changes to infrastructure or operational regimes on site that could reduce emissions of NOx and increase dispersion; • Use of the above information to propose appropriate changes, including but not limited to an assessment of the following options: changes to stack configuration to enhance dispersion (e.g. vertical emission points and increased stack heights); amending the testing schedule to reduce the daily emissions from the testing operations; upgrading the standby engines to reduce emissions or installing newer ones with lower emissions of NOx; installing NOx abatement. If changes in the height of the stacks are demonstrated to be effective, but are not deemed feasible due to local planning restrictions, the Operator shall provide evidence of the engagement carried out with the Local Authority planning department, in support of this conclusion, and propose other emission reduction options. • The Operator shall submit an updated air dispersion modelling study demonstrating how the proposed option(s), selected among those assessed, result in reduced levels of oxides of nitrogen at the sensitive receptors, including the non-statutory ecological sites in proximity of the installation; • Proposal of the shortest practical timescale for the implementation of the selected improvements. • Proposals for optimising the duration, frequency or timing of engine testing scenarios whilst taking into account those weather conditions demonstrated by modelling to have the greatest potential for environmental impact in order to reduce emissions, improve dispersion and reduce potential environmental impact; • A review into the potential for reductions in the number of generators operating simultaneously during testing and maintenance periods; 	31/03/2023

Table S1.3 Improvement programme requirements

Reference	Requirement	Date
	<ul style="list-style-type: none"> • A review of the operation of the generators for unscheduled maintenance/repair purposes outside of scheduled maintenance/testing and emergency scenarios with the aim of reducing their operation outside of those two scenarios; • An assessment of the control systems used to carry out the testing of the generators and how these have been optimised to minimise emissions • An assessment of the operating systems to ensure only the most efficient engines are used during emergency grid failure scenario; • Proposal of an appropriate timescale for improvements. <p>This review should focus primarily on the operation of, and emissions from, the Campus and HH4 (phase 1) data centres which have been shown by air dispersion modelling to have the highest potential for environmental impact. The review and timescales for any recommendations for improvement shall be submitted to the Environment Agency in writing for approval. The operator shall implement any agreed recommendations within the timescales approved by the Environment Agency.</p>	
IC9	<p>The operator shall submit to the Environment Agency for approval a monitoring plan detailing their proposal for the implementation of the flue gas monitoring requirements specified in Table S3.1, in line with web guide 'Monitoring stack emissions: low risk MCPs and specified generators' Published 16 February 2021 (formerly known as TGN M5). The plan shall include, but not be limited to:</p> <ul style="list-style-type: none"> - When the generators are not fitted with sampling ports, a proposal to install them within the shortest practical timeline; - Details of any relevant safety, cost and operational constraints affecting the monitoring regime, in support of any proposed deviation from the testing regime specified in table S3.1. 	31/03/2022
IC10	<p>The operator shall submit a written report to the Environment Agency for approval that:</p> <ul style="list-style-type: none"> - Confirms the destination of surface water discharges from the Maylands and Centro sites; - Includes updated detailed surface water drainage diagrams for the Maylands and Centro sites. <p>The report and timescales for any recommendations for improvement shall be submitted to the Environment Agency in writing for approval. The operator shall implement any agreed recommendations within the timescales approved by the Environment Agency.</p>	31/03/2022

Schedule 2 – Waste types, raw materials and fuels

Table S2.1 Raw materials and fuels	
Raw materials and fuel description	Specification
Sulphur content in diesel fuel	0.001% max

Schedule 3 – Emissions and monitoring

Emission point ref. & location	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
<p>HH4 (Phase 1) Data Centre: HH4-06 to HH4-10, HH4-16 to HH4-20, HH4-26 to HH4-30. [shown on HH4 Phase 1 plan in Schedule 7].</p> <p>Campus Data Centre: GEN-SC-1. [shown on Campus plan in Schedule 7]</p>	<p>15 standby diesel generator exhausts</p> <p>1 standby diesel generator exhaust</p>	Oxides of nitrogen (NO and NO ₂ expressed as NO ₂)	No limit set	In line with web guide 'Monitoring stack emissions: low risk MCPs and specified generators' Published 16 February 2021 (formerly known as TGN M5)	Every 1500 hours of operation or once every five years (whichever comes first). [Note 1]	In line with web guide 'Monitoring stack emissions: low risk MCPs and specified generators' Published 16 February 2021 (formerly known as TGN M5)
		Carbon monoxide	No limit set	In line with web guide 'Monitoring stack emissions: low risk MCPs and specified generators' Published 16 February 2021 (formerly known as TGN M5)	Every 1500 hours of operation or once every five years (whichever comes first). [Note 1]	In line with web guide 'Monitoring stack emissions: low risk MCPs and specified generators' Published 16 February 2021 (formerly known as TGN M5)
		Sulphur dioxide	No limit set	--	No requirement	--
		Particulates	No limit set	--	No requirement	--
<p>Campus Data Centre: CP-A1 to CP-A30 [shown on Campus plan in Schedule 7]</p>	Standby diesel generator exhausts [30 at Campus;	No parameters set	No limit set	--	No requirement	--

Table S3.1 Point source emissions to air – emission limits and monitoring requirements

Emission point ref. & location	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
<p><u>Centro Data Centre:</u> C-A1 to C-A4 [shown on Centro plan in Schedule 7]</p> <p><u>Maylands Data Centre:</u> ML-A1 to ML-A14 [shown on Maylands plan in Schedule 7]</p>	<p>4 at Centro; 14 at Maylands]</p>					
<p>Vents associated with diesel fuel storage tanks:</p> <p><u>Campus Data Centre:</u> Vents from belly tanks 1 – 31.</p> <p><u>Centro Data Centre:</u> Vents from belly tanks 1 – 4 and one bulk diesel storage tank.</p> <p><u>Maylands Data Centre:</u> Vents from belly tanks 1 – 14 and two bulk diesel storage tanks, Suite 1 Tank 1 & Suite 1 tank 2.</p> <p><u>HH4 (Phase 1) Data Centre:</u> Vents from belly tanks 06 – 10, 16 – 20 and 26 – 30.</p>	<p>Vents from diesel storage belly tanks and bulk diesel storage tanks:</p>	<p>No parameters set</p>	<p>No limit set</p>	<p>--</p>	<p>--</p>	<p>--</p>

Note 1: Unless otherwise agreed in writing with the Environment Agency as a result of approval of Improvement Condition IC9.

Table S3.2 Point source emissions to sewer, effluent treatment plant or other transfers off-site—emission limits and monitoring requirements

Emission point ref. & location	Source	Parameter	Limit (incl. Unit)	Reference period	Monitoring frequency	Monitoring standard or method
<u>Campus Data Centre:</u> Emission point CP-SW1 on Campus site plan in Schedule 7.	Uncontaminated site surface water via oil interceptor	No parameters set	--	--	--	-
<u>Centro Data Centre:</u> Emission point C-SW1 on Centro site plan in Schedule 7.	Uncontaminated site surface water	No parameters set	--	--	--	-
<u>Maylands Data Centre:</u> Emission point ML-SW1 on Maylands site plan in Schedule 7.	Uncontaminated site surface water via oil interceptor	No parameters set	--	--	--	-
<u>HH4 (Phase 1) Data Centre:</u> Emission point HH4-SW1 on HH4 (phase 1) site plan in Schedule 7.	Uncontaminated site surface water via oil interceptor	No parameters set	--	--	--	-

Schedule 4 – Reporting

Parameters, for which reports shall be made, in accordance with conditions of this permit, are listed below.

Table S4.1 Reporting of monitoring data			
Parameter	Emission or monitoring point/reference	Reporting period	Period begins
Emissions to air Parameters as required by condition 3.5.1.	<u>HH4 (Phase 1) Data Centre:</u> HH4-06 to HH4-10, HH4-16 to HH4-20, HH4-26 to HH4-30. <u>Campus Data Centre:</u> GEN-SC-1.	Every 1500 hours of operation once or every five years (whichever comes first).	Within 4 months of the issue date of the permit or the date when the engine is first put into operation, whichever is later. [Note 1]
Note 1: Unless otherwise agreed in writing with the Environment Agency as a result of approval of Improvement Condition IC9.			

Table S4.2 Performance parameters		
Parameter	Frequency of assessment	Units
Diesel usage	Annually	tonnes
Generator operation for testing/maintenance	Report to be submitted annually	<ul style="list-style-type: none"> - total hours for each site (hours) - total hours per generator (hours) - total number of runs per generator (number) - number of minutes per run (minutes)
Generator operation for emergency running	Within 24 hours of emergency operation commencing	<ul style="list-style-type: none"> - date and time of National Grid failure; - number of generators operating immediately after the failure (number); - number of generators operating two hours after the failure (number); - total duration (anticipated duration) of mains supply failure (hours)
Generator operation for emergency running	Annually	<ul style="list-style-type: none"> - total number of runs (number); - total duration of runs (hours).
Generator operation for non-scheduled maintenance operations	Annual	<ul style="list-style-type: none"> - total number of hours for each site (hours); - total hours per generator (hours); - date and time of operation of generators.

Table S4.3 Reporting forms		
Parameter	Reporting form	Form version number and date
Point source emissions to air	Emissions to Air Reporting Form, or other form as agreed in writing by the Environment Agency	Version 1, 08/03/2021
Other performance parameters	Other Performance Parameters Reporting Form, or other form as agreed in writing by the Environment Agency	Version 1, 08/03/2021
Generator operation during emergency scenario	Generator Emergency Scenario Reporting Form or other form as agreed in writing by the Environment Agency	Version 1, 08/03/2021

Schedule 5 – Notification

These pages outline the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the EP Regulations.

Part A

Permit Number	
Name of operator	
Location of Facility	
Time and date of the detection	

(a) Notification requirements for any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution	
To be notified within 24 hours of detection	
Date and time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substances(s) potentially released	
Best estimate of the quantity or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop the emission	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Time periods for notification following detection of a breach of a limit	
Parameter	Notification period

(c) Notification requirements for the breach of permit conditions not related to limits	
To be notified within 24 hours of detection	
Condition breached	
Date, time and duration of breach	
Details of the permit breach i.e. what happened including impacts observed.	
Measures taken, or intended to be taken, to restore permit compliance.	

(d) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substances(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B – to be submitted as soon as practicable

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the facility in the preceding 24 months.	

Name*	
Post	

Signature	
Date	

* authorised to sign on behalf of the operator

Schedule 6 – Interpretation

“accident” means an accident that may result in pollution.

“application” means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under Schedule 5 to the EP Regulations.

“authorised officer” means any person authorised by the Environment Agency under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in section 108(4) of that Act.

“emissions to land” includes emissions to groundwater.

“EP Regulations” means The Environmental Permitting (England and Wales) Regulations SI 2016 No.1154 and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations.

“emissions of substances not controlled by emission limits” means emissions of substances to air, water or land from the activities, either from the emission points specified in schedule 3 or from other localised or diffuse sources, which are not controlled by an emission limit.

“groundwater” means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

“Industrial Emissions Directive” means DIRECTIVE 2010/75/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 November 2010 on industrial emissions, as read in accordance with Schedule 1A to the Environmental Permitting (England and Wales) Regulations 2016.

“MCERTS” means the Environment Agency’s Monitoring Certification Scheme.

Where a minimum limit is set for any emission parameter, for example pH, reference to exceeding the limit shall mean that the parameter shall not be less than that limit.

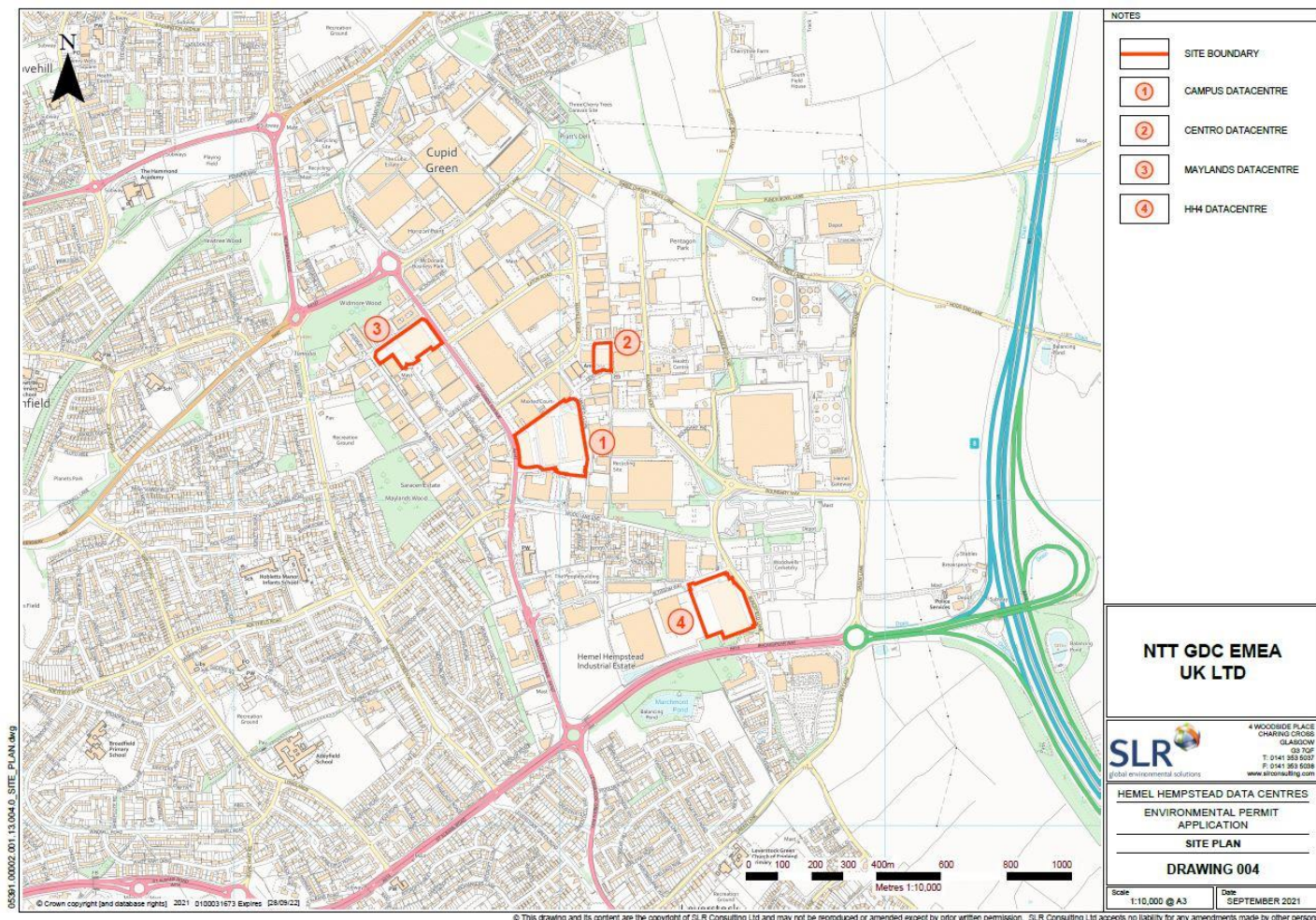
Unless otherwise stated, any references in this permit to concentrations of substances in emissions into air means:

- in relation to emissions from combustion processes, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 3% dry for liquid and gaseous fuels, 6% dry for solid fuels; and/or
- in relation to emissions from non-combustion sources, the concentration at a temperature of 273K and at a pressure of 101.3 kPa, with no correction for water vapour content.

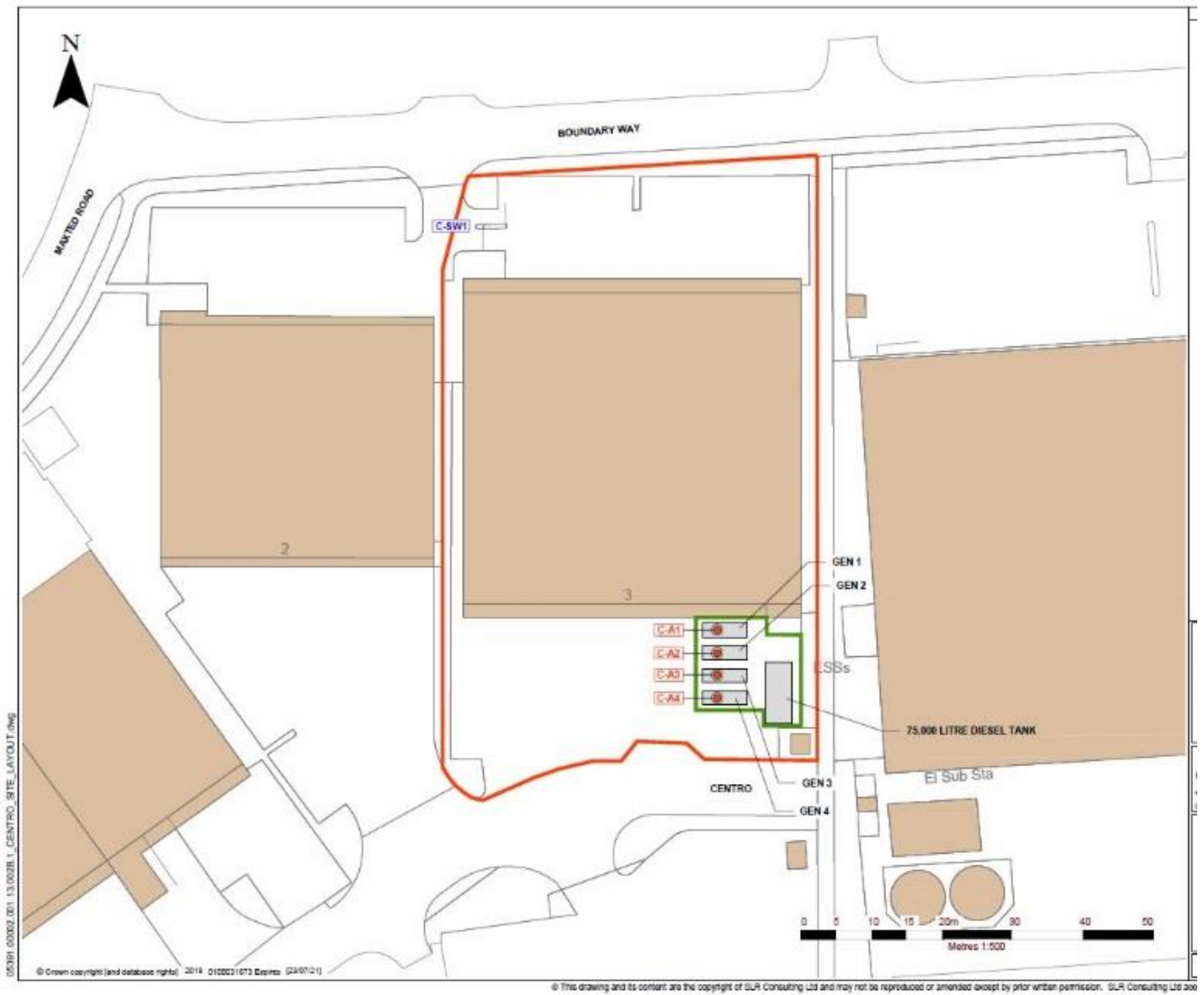
“year” means calendar year ending 31 December.

Schedule 7 – Site plan

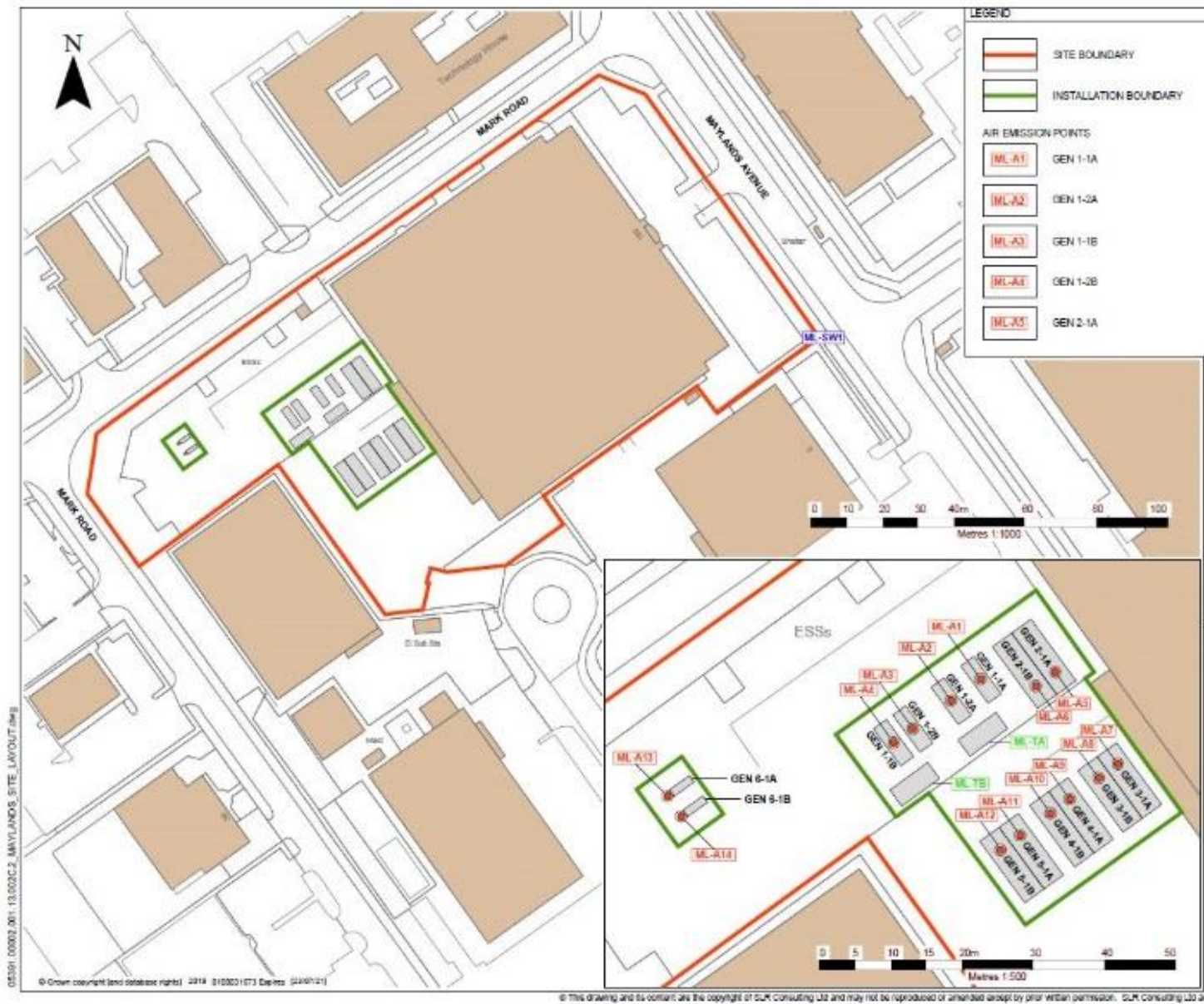
NTT Global Data Centres EMEA UK Limited Hemel Hempstead Sites:



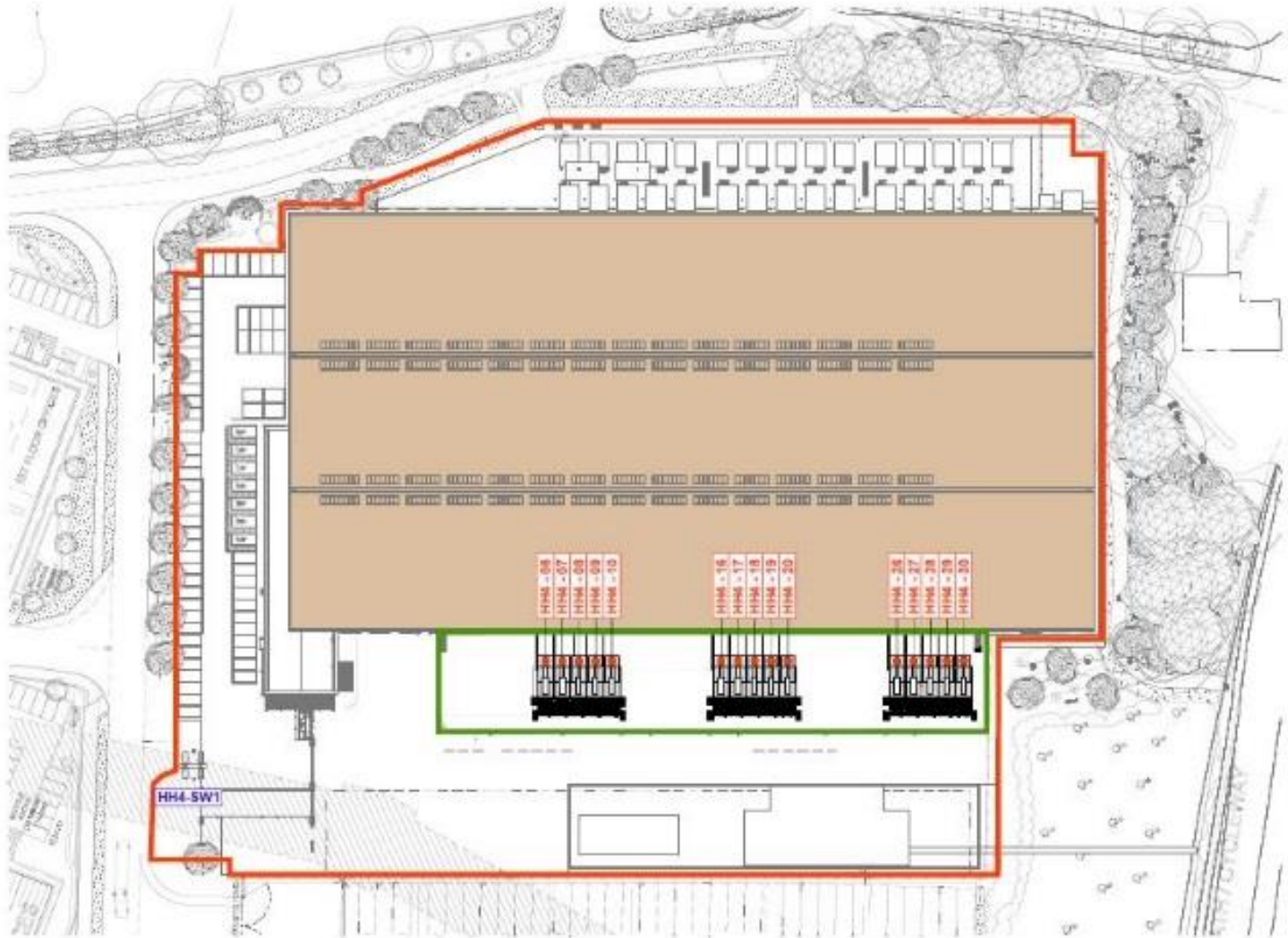
Centro Data Centre:



Maylands Data Centre:



HH4 (Phase 1) Data Centre:



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END OF PERMIT.