Permitting Decisions- Variation

We have decided to grant the Variation for Data Centre Staples Corner operated by PDCG (Group Services) Limited.

The Variation number is EPR/QP3706LH/V002.

The permit was issued on 20/05/2025.

The application is to vary an Installation permit for a data centre which has a Schedule 1 Part A(1) 1.1(a) activity for burning any fuel in an appliance with a rated thermal input of 50 or more megawatts.

The Variation will involve the installation and operation of an additional 40 gas oil or equivalent fuelled generators (Medium Combustion Plant (MCP)) with subsequent fuel storage.

Combustion plant on site:

- **Existing Site 1 (LON1B1)**: 16x gas oil or equivalent fuelled MTU 20V4000 DS4000 generators each with thermal input of 7.31 MWth (16 generators with total thermal input of 116.96 MWth) (New MCP) – already permitted.

- **Variation Site 2 (LON1B2)**: 40x gas oil or equivalent fuelled MTU 20V4000 DS4000 generators each with thermal input of 7.31 MWth (40 generators with total thermal input of 292.4 MWth) (New MCP) – variation to existing permit.

The Variation will lead to:

- Total number of MTU 20V4000 DS4000 gas oil or equivalent fuelled generators (New MCP) on site = 56.

- Total thermal rated input of site = 56x 7.31 MWth MTU 20V4000 DS4000 generators (56 generators with a total input of 409.36 MWth).

- Increase in the permitted boundary.

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 centre 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.

Gas oil or equivalent fuel for the generators is stored in bunded day (belly) tanks located under each generator and each new generator also has access to the bulk fuel storage supply.

The total capacity of gas oil or equivalent fuel that can be stored at the site is:

- **Existing Site 1 (LON1B1)** = 691,200 litres – already permitted.
- **Variation Site 2 (LON1B2)** = 1,193,500 litres – variation to existing permit.

The Variation will lead to:

- Total gas oil or equivalent fuel storage at site = 1,884,700 litres.

There will be no changes to the existing drainage as part of the Variation.

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**:**

- highlights key issues in the determination
- summarises the decision making process in the decision considerations section to show how the main relevant factors have been taken into account

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

Read the permitting decisions in conjunction with the environmental permit and the Variation notice.

Key issues of the decision

Best Available Techniques (BAT) Assessment – Emergency Power Provision on Site

Technology & Fuel

The Operator carried out a BAT assessment of the viable technologies and fuel capable of providing emergency power at the data centre.

As outlined in the Environment Agency's 'Data Centre FAQ' document, we accept that gas oil or equivalent fuel generators are presently a commonly used technology for standby generators. Currently gas oil or equivalent fuel generators are the preferred option for the supply of standby power for data centres and are a proven technology for providing reliable resilience of functionality which can be started from cold very quickly.

We have specified the fuel to be burned in the engines to consist of gas oil or equivalent substitute to be agreed in writing with the Environment Agency with a maximum sulphur content of 0.001% w/w. We are in the process of developing our position on the use of gas oil substitute fuels such as hydrotreated vegetable oil (HVO), therefore we have required that if any of these fuels are proposed, written agreement is sought by the Operator from the Environment Agency's regulatory officer. The Operator confirmed that it is anticipated that the units will primarily be run using HVO. Low sulphur gas oil will be used to run the generators if required as an alternative. The Operator is already permitted to use gas oil or an agreed equivalent substitute.

Managing Emissions

Point Source Emissions to Air

Emissions to air from the Installation will principally comprise combustion gases arising from the operation of the generation plant under emergency, testing and maintenance scenarios.

The primary pollutants of concern to air quality from the combustion processes at the Installation are nitrogen oxides (NOx), carbon monoxide (CO), particulates (PM10) and sulphur dioxide (SO_2).

The Operator has taken measures to minimise emissions from the gas oil or equivalent fuel generators under emergency, testing and maintenance scenarios.

Both the Data Centre FAQ Headline Approach v21 and Emergency backup diesel engines on installations: best available techniques (BAT) - GOV.UK (www.gov.uk) specifies the BAT emissions specification for new gas oil fired reciprocating engines as emissions optimised to 2g-TA Luft or US EPA Tier 2 or

an equivalent. These are the international standards that we have concluded that we will use to infer what BAT is for sites.

The Operator has confirmed that the additional generators to be used at the data centre are emissions optimised to meet the US EPA Tier 2 standard.

We do not consider SO_2 emissions to be a risk from the operation of the Installation as we have included a condition in the permit restricting the fuel to ultra-low sulphur gas oil or equivalent fuel resulting in negligible emissions of sulphur.

Aqueous Releases from Site

The Operator has confirmed that the Variation will not change the aqueous releases from site.

Protection Against Power Outage and Minimisation of Generator Operation

The choice and configuration of standby plant is driven by the data centre design. MCPs are configured to ensure an N+1 arrangement for each load group; when considering the operation of the new 40 generators in an emergency scenario, 36 engines would run at 100% load with the remaining 4 act as swing engines. This ensures that during the maintenance of a generator, other engines are able to provide full cover in an emergency scenario.

Power to the site is provided by the National Grid with two separate cables from the substation, increasing reliability of the system and reducing the likelihood of generators requiring use. The Operator notes that the National Grid Electricity Transmission System serving the site achieved an overall reliability supply of 99.999998% over the 2023-2024 period. Furthermore, there have been only 4 outages in the power supply from the Elstree substation in the last 10 years, in two instances the outage lasted less than three minutes, and in the other cases lasted 104 minutes and 300 minutes.

Air Quality

In line with the Environment Agency's guidance (Air emissions risk assessment for your environmental permit - GOV.UK (www.gov.uk)) and the relevant parts of the guidance applicable to the assessment of air dispersion modelling of emissions from generators (Specified generators: dispersion modelling assessment - GOV.UK (www.gov.uk)) the Operator submitted detailed air dispersion modelling and impact assessment to assess the predicted impacts on human receptors and ecological sites.

The methodology for risk assessment of point source emissions to air, and the associated definitions, are set out in our guidance Air emissions risk assessment for your environmental permit - GOV.UK (www.gov.uk).

Operator's Assessment of Potential Impact on Air Quality

The Operator submitted an Air Emissions Risk Assessment prepared by Hoare Lea (the Consultant), commissioned by PDCG (Group Services) Limited (the applicant). Two addendums were also submitted by the Operator, which addressed requests from the Environment Agency including assessment of 100th percentile NO_2 and NO EALs (first addendum) and assessment of 72-hour emergency operation and combined annual impacts of testing (second addendum). All three considered the potential impacts of the principal pollutants of concern with respect to emissions to air from low sulphur gas oil generators.

The Operator submitted the reports in support of their permit Variation application to operate a set of 40 standby gas oil or equivalent fuelled generators at their Installation additional to the standby generators already on site. The existing plant, permitted under ERP/QP3706LH/A001, comprises 16 generators with a total combined thermal input of approximately 116.96 MWth. The new standby generators (SBG) proposed in the Variation will increase the combined thermal input to 409.36 MWth.

The Consultant has modelled the generator emissions under the assumption of gas oil fuel, when in reality the generators will be run on HVO fuel, which has a lower emission rate for oxides of nitrogen.

The Consultant has assessed potential impacts at human and ecological receptors for nitrogen oxides (NOx), particulate matter (PM10), sulphur dioxide (SO_2), carbon monoxide (CO), and total organic carbon (TOC) as benzene within the defined screening distances.

Human Receptors

They considered 17 discrete human receptor locations, including residential properties, schools, leisure, commercial, industrial and retail.

Ecological Receptors

They considered the following protected sites:

Site of Special Scientific Interest (SSSI):

Brent Reservoir

They considered the following local sites:

Local Wildlife Sites (LWS):

- Brent Reservoir
- Harp Island
- Grange roundabout nature area

- Dollis Hill Reservoir
- Gladstone Park
- Dudding Hill Loop between Cricklewood and Harlesden
- Railway Cutting
- Metropolitan Line between Kilburn and Neasdon
- Clitterhouse Playing Fields
- Clarefield Park
- Lower Dollis Brook
- Hendon Park and Northern Line
- Silk Stream and Burnt Oak Brook
- Kingsbury Road Bank
- Meadow Way Copse

No Special Area of Conservation (SAC), Special Protection Area (SPA) or Ramsar site was identified within the 10 km screening distance.

The data centre is situated in Brent Air Quality Management Area (AQMA) declared for annual mean NO_2 and 24-hour PM10 exceedances.

The Consultant modelled **four** main operational scenarios: two testing scenarios (monthly and six-monthly) and two emergency scenarios (outage) of 48 hours and 72 hours.

The Consultant stated that testing will occur between 08:00 and 20:00 hours but has run the model for a full year (8,760 hours), undertaking statistical analysis to establish the probability of exceeding the 1-hour mean NO_2 Environmental Standard (ES). Annual mean results have been factored to the total hours of operation.

The Consultant confirmed in their second addendum that site 1 and site 2 will not be tested within the same 24-hour period.

Monthly Testing

Monthly testing regimes for site 1 (existing) and site 2 (proposed) are not identical. Site 1 monthly routine testing involves each SBG operating individually for 30 minutes at 10% engine load. This is consistent with the existing permit (ERP/QP3706LH/A001). At site 2, the SBGs are tested in groups of eight (total of 5 groups) for 30 minutes at 50% load. The Consultant has confirmed that site 2 groups would not be tested within the same hourly period.

Six-monthly Testing

Six-monthly testing represents routine testing during which the site 1 and site 2 SBGs are operated individually at 100% load for 4 hours, twice per year.

Testing scenarios do not take place in the same month, with the monthly testing occurring once a month for 10 months of the year and the 6-monthly testing occurring during the remaining 2 months.

Emergency (outage) Scenario

The emergency scenario assumes 16 (site 1) and 36 (site 2) SBGs operate concurrently at 75% and 100% load, respectively. Each site has 4 generators dedicated as 'swing' generators, which would not operate under an emergency scenario except in the unlikely event that other generators were non-operational. To represent this within the modelling for site 1, the Consultant modelled all 16 generators at 75% load rather than 12 at 100% load. The Consultant presented the modelling outputs for 48-hours of emergency operation within their AQA and 72-hours within their second addendum. Within the first addendum the Consultant states "There is a contractual obligation for PDCG (Group Services) Ltd to keep a maximum 48 hours of fuel on site".

Their conclusions were:

Impact on Human Health Receptors

- **No exceedances** of the annual or 1-hour NO_2 or NO ES at discrete human receptor locations for the **testing scenarios**.

- **Exceedances** of the 1-hour NO_2 ES for the **emergency scenario**. Although they have not presented their hourly NO_2 predictions against the US EPA Acute Exposure Guideline Levels (AEGLs), we have identified they predict potential **exceedances** of both 1-hour and 10-minute AEGL-1 for their **emergency scenarios**.

- Predicted by means of hypergeometric distribution analysis that the probability of an exceedance of the hourly mean NO_2 ES was less than 5% (unlikely) for the 48-hour emergency scenario, therefore **exceedances are unlikely**. For the 72-hour emergency the probability of exceedance was greater than 5% and therefore there is **potential for exceedances**.

Impact on Ecological Receptors

- **PCs greater than 100%** of the daily NOx critical level of 200 $\mu g/m^3$ for both **emergency scenarios** for all receptors, except Metropolitan Line between Kilburn and Neasdon LWS and Meadow Way Copse LWS. **All other PCs** were predicted to be less than 100% **(insignificant)** of all critical levels and loads for all local nature sites for **all scenarios**.

- **PCs greater than 1%** of the annual NOx critical level of 30 µg/m^3 and **PECs exceeding the critical level for Brent Reservoir SSSI for all scenarios**. The NOx background concentration already exceeds the critical level.

- **PCs greater than 10%** of the higher daily NOx critical level of 200 µg/m^3 and **PECs exceeding the critical level for Brent Reservoir SSSI for the monthly testing and both emergency scenarios.** The Consultant evidenced that ozone and sulphur background concentrations are below their respective critical levels and therefore the higher daily NOx critical level of 200 µg/m^3 applies.

- **PCs greater than 1%** of the nitrogen deposition critical load of 10 kgN/ha/yr and **PECs exceeding the critical load for Brent Reservoir SSSI for the combined testing and emergency scenarios**. The Consultant noted "*no critical loads are available for Brent Reservoir SSSI*", instead they utilised the critical load for broadleaved woodland as woodland is the habitat closest to the application site.

Environment Agency review of Operator assessment of potential impact on air quality

The Consultant has assessed potential impacts at human and ecological receptors for nitrogen oxides (NOx), particulate matter (PM10), sulphur dioxide (SO_2), carbon monoxide (CO), and total organic carbon (TOC) as benzene.

We have only audited NOx, as particulate matter, CO and TOC are considered to have a low risk of exceedance and we do not consider SO_2 emissions to be a risk from the operation of the Installation as we have included a condition in the permit restricting the fuel to ultra-low sulphur gas oil or equivalent fuel resulting in negligible emissions of sulphur.

We have carried out our own audit by means of detailed check modelling and sensitivity analysis on the air quality and habitats assessments presented by the Consultant which included:

- Predictions for 48- and 72-hour emergency operation.
- Our own meteorological data observed at Heathrow airport.
- A higher surface roughness of 0.5m for the meteorological site.
- Predictions with and without buildings.
- A lower short-term NOx to NO_2 conversion rate.
- Relocation of human health receptors to the building façades.
- Two additional local nature site receptors.

Human Health Assessment

As a result of our checks, although we do not fully agree with the Operator's numerical values, the outcome of our checks indicate the following:

- The Operator's **testing scenario** predictions are **unlikely** to make a significant contribution or cause an exceedance of an Environmental Standard (ES) at human health receptors.

- We cannot rule out **exceedances** of the 1-hour mean NO_2 ES, 10-minute NO_2 AEGL-1 and the 1-hour NO EAL for the **emergency scenario**.

- We understand from the Operator that the likelihood of emergency operation taking place is considered low as grid outages are unlikely based on historic data, therefore, **the likelihood of exceedances of any of the ES is considered low.**

Habitats Assessment

As a result of our checks, although we do not fully agree with the Operator's numerical predictions, the outcome of our checks indicate the following:

- In the case of the **testing scenarios**, all PECs are predicted to be **within** the critical levels and loads at all local nature site receptors.

- We predict **exceedances** of the annual NOx critical level of 30 $\mu g/m^3$ and nitrogen deposition critical load of 10 kgN/ha/yr at Brent Reservoir SSSI for the **testing scenarios**. We note that the background NOx and nitrogen deposition concentrations are already exceeding the respective critical level and load. We note that the physical extent of the exceedances is limited to the easterly section of the SSSI which lies directly to the north of to the Installation site.

- We find **exceedances** of daily NOx at Brent Reservoir SSSI for both **testing scenarios** if we do not apply restrictions on the daily operational hours:
    - For monthly testing, we understand the maximum daily hours of operation for site 1 to be 8 hours and for site 2 to be 2.5 hours; if these are applied as operational restrictions, we **do not** find exceedances of daily NOx.

    - The current permit (ERP/QP3706LH/A001) restricts the six-monthly testing to one 4-hour test per day. For six-monthly testing we have considered the maximum number of hours they could operate to avoid an exceedance. If we restrict six-monthly testing to a maximum of 8-hours of operation within a 24-hour period, we **do not** find exceedances of daily NOx.

- We cannot rule out **exceedances** of the higher daily NOx critical level of 200 µg/m^3 at any ecological receptor for either **emergency scenario**. We also cannot rule out **exceedances** of annual NOx and nitrogen deposition at Brent Reservoir SSSI for the **emergency scenarios**.

- We note that the likelihood of **emergency operations** taking place is a more important factor in considering the risks of daily NOx critical level exceedance. Historic data provided by the Operator indicates that the grid reliability at the Installation site appears to be good, the **likelihood of the emergency scenario occurring is expected to be low.**

Overall, we find that:

Human Health

The site is unlikely to cause an exceedance of an ES at human health receptors in both testing and emergency scenarios providing the electricity grid remains high.

Habitats

Emergency (outage) Scenario

The Consultant's modelling and our audit predicts possible exceedances of the daily mean NOx critical level should prolonged emergency operations coincide with worst-case meteorological conditions, at all LWSs during emergency operation. However, the modelling is based on a worst-case and we consider that emergency operation is unlikely to occur provided grid reliability remains high. The Consultant confirmed that the likelihood of long periods of reliance on the generators to provide power to the site is considered to be highly unlikely given that the National Grid Electricity Transmission System, which serves the site, achieved an overall reliability supply of 99.999998% over the 2023-2024 period. Furthermore, there have been only 4 outages in the power supply from the Elstree substation in the last 10 years, in two instances the outage lasted less than three minutes, and in the other cases lasted 104 minutes and 300 minutes.

The structural preventative measures taken to avoid the occurrence of this emergency scenario make the source/pathway/receptor mechanism very unlikely to occur. For the Installation, we consider that the reasonably likely source/pathway/receptor mechanism would consist of periodic testing operations of the engines. For the testing scenarios our audit showed that process contributions at all LWSs are predicted to be below 100% of the ES.

Although we cannot rule out exceedances of the daily mean NOx critical level at LWSs, we note that the likelihood of emergency operations taking place is a more important factor in considering the risks of daily mean NOx critical level

exceedance. Therefore, as the grid reliability in the local area appears to be good, the likelihood of the emergency scenario occurring is expected to be low.

Testing

The site is unlikely to make a significant contribution to or cause an exceedance of any critical loads and levels at ecological receptors for both testing scenarios for daily NOx providing the following operational restrictions are included in the permit:

- Testing of site 1 and site 2 shall not be carried out in the same 24-hour period.
- Testing at site 1 shall involve each generator being tested individually.
- For six-monthly testing, no more than 8 hours of operation shall be carried out in any 24-hour period.
- For monthly testing, no more than 8 hours of operation shall be carried out in any 24-hour period for site 1.
- For monthly testing, no more than 2.5 hours of operation shall be carried out in any 24-hour period for site 2.

However, we are predicting exceedances of annual NOx and nitrogen deposition at Brent Reservoir SSSI for the testing scenarios.

For the 6 monthly testing the annual NOx is predicted to be:

- LT PC > 1% of critical level, it is 2.2%
- LT PEC > 70% of critical level, it is 117.9%

For the 6 monthly testing the nitrogen deposition is predicted to be:

- LT PC > 1% of critical load, it is 1.87%
- LT PEC > 70% of critical load, it is 117.9%

For the monthly testing the annual NOx is predicted to be:

- LT PC > 1% of critical level, it is 1%.
- LT PEC > 70% of critical level, it is 118.7%

The background NOx and nitrogen deposition concentrations already exceed their relevant critical level and load at Brent Reservoir SSSI.

We have therefore, consulted our Habitats Team on the exceedances at Brent Reservoir SSSI for annual NOx and nitrogen deposition for the testing scenarios to see if there are likely significant effects.

HRA Team Assessment

Appendix 4 – SSSI

An Appendix 4 SSSI Assessment was carried out on Brent Reservoir SSSI.

Based on the results shown in the AQA, NOx critical level (CLe) of 30 µg/m^3 and nitrogen deposition critical load (CLo) of 10 kgN/ha/yr for all scenarios exceed the insignificance screening thresholds. Similarly, exceedances of the daily NOx CLe of 75 µg/m^3 and 200 µg/m^3 at Brent Reservoir SSSI have also been reported under emergency scenarios. However, these exceedances are only possible if the Installation will operate continuously (8,760h/yr) in parallel. In reality, the operating times will be those shown in the scenarios described above. As such, the volume and emission rates will be expected to be much lower than those modelled in the conservative scenario. We note that the likelihood of emergency operations taking place is a more important factor in considering the risks of daily NOx critical level exceedance. Historic data provided by the Operator indicates that the grid reliability at the Installation site appears to be good, the likelihood of the emergency scenario occurring is expected to be low.

For monthly testing, we understand the maximum daily hours of operation for site 1 to be 8 hours and for site 2 to be 2.5 hours; if these are applied as operational restrictions, we do not find exceedances of daily NOx. For six-monthly testing we have considered the maximum number of hours they could operate to avoid an exceedance. If we restrict six-monthly testing to a maximum of 8-hours of operation within a 24-hour period, we do not find exceedances of daily NOx.

Our specialist Air Quality Modelling and Assessment Unit (AQMAU) has checked the AQA and provided the following recommendations:

- Testing of site 1 and site 2 shall not be carried out in the same 24-hour period.
- Testing at site 1 shall involve each generator being tested individually.
- For six-monthly testing, no more than 8 hours of operation shall be carried out in any 24-hour period.
- For monthly testing, no more than 8 hours of operation shall be carried out in any 24-hour period for site 1.
- For monthly testing, no more than 2.5 hours of operation shall be carried out in any 24-hour period for site 2.

We concur with these recommendations and consider that it is appropriate to be included in the permit as operational restrictions.

In support of the permit variation application, the Operator submitted an 'Ecology Statement'. The report highlights, and we agree, that there are currently no critical loads for nitrogen and acid deposition for the habitats discussed in this assessment.

We have checked APIS to understand the nitrogen and acid deposition values and sources. We have found that industrial combustion is not a source of nitrogen deposition at this site, signifying that there are no known sources of nitrogen emissions in the area which contribute or could increase the nitrogen load. All sources are attributed to other generators. In this context, based on the proposed activity's intermittent emission profile and short duration, coupled with the low likelihood of activating the emergency scenarios and the operational conditions, we consider that nitrogen will potentially have an insignificant contribution to the nitrogen canvas. This reasoning is also applicable to the acid deposition concern. While we have found that 10.4% of sulphur deposition at Brent Reservoir SSSI comes from industrial combustion sources, this represents a Total Deposition of only 0.29 kgS/ha/yr. Therefore, it is likely that both nitrogen acid deposition, and sulphur is included in the background calculations for the emissions from the existing MCPs (Site 1). Therefore, the exceedance rates for these parameters, including NOx, are likely to have been partially double counted in the dispersion modelling.

We have consulted with the Environment Agency internal Fisheries, Biodiversity and Geomorphology (FBG) team. They had concerns over the impact on wildlife and flora found in Local Wildlife Sites (LWS) potentially impacted by the proposed activity. However, following 'The Conservation of Habitats and Species Regulations 2017', legislation governing the format of the present assessment, LWS are not part of this assessment which is concerned with Sites of Special Scientific Interest. Furthermore, the species protection over which the FBG team raised concerns are not qualifying features of the Brent Reservoir SSSI. We note that the potential impacts on LWS is conducted under different legislation, namely the Environment Act 1995 and the Natural Environment and Rural Communities Act (NERC) 2006 – neither of these documents are captured under the Appendix 4 Assessment, which is concerned with SSSI only.

However, we have considered the FBG opinion in our assessment and addressed it below.

To maintain the integrity of the habitats and species present in the Brent Reservoir SSSI, some of which are highly mobile and are likely to travel to adjacent protected sites, including LWS, we consider that there is no damaging impact if the following operational limitations are included in the environmental permit:

- Testing of site 1 and site 2 shall not be carried out in the same 24-hour period.
- Testing at site 1 shall involve each generator being tested individually.

- For six-monthly testing, no more than 8 hours of operation shall be carried out in any 24-hour period.
- For monthly testing, no more than 8 hours of operation shall be carried out in any 24-hour period for site 1.
- For monthly testing, no more than 2.5 hours of operation shall be carried out in any 24-hour period for site 2.

Following our assessment, we find that the proposed permission is not likely to damage any of the flora, fauna or geological or physiological features which are of special interest.

Overall, we agree with the Consultant's conclusions that the site is unlikely to cause an exceedance of an ES at human health receptors and is unlikely to make a significant contribution to or cause an exceedance of any critical loads and levels at ecological receptors providing operational restrictions are included in the permit and the electricity grid remains reliable.

We do note that the site has a very large number of unabated plant in close proximity to residential receptors (<300 m). The Operator has not proposed abatement on any of the generators, however, if emissions to air become a problem at this site, the Operator may be required to fit abatement in the form of Selective Catalytic Reduction (SCR) or to at least get the generators SCR-ready (i.e. planned with available space to retrofit equipment for abating emissions).

In the same way, if the site wishes to expand in the future, the Operator may be expected to go beyond BAT and fit SCR to manage the impact of peak emissions from emergency operation and/or testing and maintenance on long term Air Quality Standards as per our guidance contained in Data Centre FAQ Headline Approach v21.

We have set improvement condition (IC6) to require the Operator to reduce NOx emissions further by reviewing the testing regime and assessing other opportunities to reduce emissions (e.g. SCR abatement). The additional measures specified under IC6 are expected to achieve a reduction of impacts during both the testing and emergency operations.

Protection of Land, Surface Water & Groundwater

The 40 new generators are housed in a fully enclosed building, situated in pairs, and over 5 floors (8 per floor); each generator has its own day (belly) tank.

Site 2 (LON1B2) also has 20 bulk fuel storage tanks which represent 1 storage tank per 2 generators. However, these tanks act together as a larger balancing tank and are not dedicated to the pair of tanks which they serve.

The tanks are positioned underneath the engines at ground level, minimising pipe-runs and pumping distances to point of use.

The Variation will lead to an additional fuel storage capacity of 1,193,500 litres which comprises of:

- 40x day (belly) fuel tanks with a capacity of 1,200 litres.
- 17x bulk fuel tanks with a capacity of 61,000 litres.
- 2x bulk fuel tanks with a capacity of 38,500 litres.
- 1x bulk fuel tank with a capacity of 31,500 litres.

The existing permit allows a total capacity of 691,200 litres of fuel to be stored. Following this Variation, the total fuel permitted to be stored on site will be 1,884,700 litres.

Day (Belly) Tanks

This Variation will lead to the addition of 40 new day (belly) tanks which are adjacent to the new generators. Each day (belly) tank has a capacity of 1,200 litres. The day (belly) tanks are constructed from carbon steel sheets of varying thickness dependent on tank size and are double skinned (integrally bunded).

The day (belly) tanks conform to the following specifications and standards:

- BS 799 Welding to be carried out i.a.w. BS EN 1011-1:2009 with reference to BS EN 1011-2:2001.
- Inspection & testing to be carried out i.a.w. B EN 1011-1:2009.
- All tanks are stiffened in accordance with BS 799-5:2010.
- BS EN 12285-2.

The day (belly) tanks have leak detection in place which alarms if fuel is detected within the secondary containment. There is also remote monitoring of tank levels with alarms that sound if there is a change in fuel levels. All alarms are linked to the local control system and BMS system. The tanks will be protected against corrosion internally by being treated with an anticorrosion coating and externally by being painted to C3 standards.

Bulk Fuel Tanks

This Variation will lead to the addition of 20 new bulk fuel tanks which are located on the ground floor of the building underneath the banks of generators in the north tank room and south tank room. The bulk fuel tanks vary in capacity. The tanks are constructed from carbon steel sheets of varying thickness dependent on tank size and are double skinned (integrally bunded).

The bulk fuel tanks conform to the following specifications:

- BS 799 Welding to be carried out i.a.w. BS EN 1011-1:2009 with reference to BS EN 1011-2:2001.
- Inspection & testing to be carried out i.a.w. B EN 1011-1:2009.

- All tanks are stiffened in accordance with BS 799-5:2010.
- BS EN 12285-2.

The bulk fuel tanks have leak detection in place which alarms if fuel is detected within the secondary containment. There is also remote monitoring of tank levels with alarms that sound if there is a change in fuel levels. All alarms are linked to the local control system and BMS system. The tanks will be protected against corrosion internally by being treated with an anticorrosion coating and externally by being painted to C3 standards.

Fuel Dump Tanks

There are two dump tanks on site – one within the north tank room and one within the south tank room. Each of the day (belly) tanks in the generator rooms will be fitted with a dump valve. In the event of a fire in the generator room, the dump valve opens and drains the fuel into the dump tank on the ground floor and then pumped from the dump tanks into the bulk storage tanks.

Positioning of the tanks within a building with impervious surfacing limits potential risks to land, surface water and groundwater. Spill kits will be available within the building, and visual external inspections of tanks will be undertaken daily.

Fuel delivery points are located to the north and south of the enclosed building (serving the north tank room and south tank room respectively). The area is over hardstanding, with all surface water drainage leading to two new interceptors.

Pipework

All pipework is constructed from heavy duty welded carbon steel and conforms to Guidance for Pollution Prevention 2. All pipework located outside of secondary containment, or out of sight of Operators will be double skinned, i.e. between fill point and bulk tank room, as well as within pipework risers to generator plantrooms.

The pipework will be inspected regularly, and leaks will be detected by the manual inspection of outer skin at low points. The secondary containment is monitored with automated leak detection with an alarm to the local control system and BMS system.

Fuel Delivery Areas, Drainage & Interceptors

Two new fuel delivery areas will be installed as part of this Variation (north car park and south car park). The delivery areas will have impermeable surfacing and will drain to oil/water interceptors.

Two new oil/water interceptors will be installed as part of this Variation (north car park and south car park). The two new interceptors will have a capacity of 10,000 litres, each covering a 720m^3 drainage area. The tankers that make the deliveries

are compartmented into 7,600 litre compartments. Therefore, the maximum fuel spillage is 7,500 litres, which the oil/water interceptors would capture. The spilt fuel would then be pumped out of the interceptors by a registered waste disposal company.

The interceptors will be maintained in accordance with manufacturers guidance. The interceptors are monitored and alarmed to the BMS system, which measures the oil levels. There will be an inspection twice per year, with alarm probes removed and cleaned.

Drainage areas will be visually inspected daily to identify any defects that may affect the integrity and operational efficiency of the interceptors, or risk of leaks to land/groundwater.

Although there will be the installation of two new interceptors, the existing emission points to water will not change. The new drainage system installed as part of this Variation, links in with the site's existing drainage system which discharges to emission points W1 and W2 as already permitted.

We have included a Pre-operational Condition (PO2) for the Operator to undertake a review of all liquid storage, containment and bunds at the site. This review will be carried out by a qualified structural engineer and will compare all liquid storage, containment and bunds against the standards set out in CIRIA guidance: Containment systems for the prevention of pollution (C736). We have included this PO to satisfy ourselves that the site's liquid storage, containment and bunding is fit for purpose.

Noise

Noise is not a significant aspect of data centre permitting (noting that it is only the standby generators and associated gas oil or equivalent fuel supply systems that are permitted – not the operation of the data centre itself). The site will only run the generators regularly as part of the testing regimes described earlier, occurring during daytime hours. Overnight operation of the generators will only occur in an emergency situation.

We have reviewed the requirement for a Noise Impact Assessment using our qualitative noise screening criteria. Based on the nature of the Installation and its location, the limited hours of operation and the proposed noise mitigation measures, we anticipate that the risk of noise impacts will not be significant.

Consequently, the assessment confirmed that a Noise Impact Assessment and Noise Management Plan are not required. If a Noise Impact Assessment was required, then the Operator would need to submit a Noise Impact Assessment based on The Environmental Permitting (England and Wales) Regulations 2016. However, we have included our standard noise condition in the permit, which allows us to ask for a Noise Management Plan if we become aware of noise-related problems on site.

Permit Conditions

The Permit condition 2.3.3 limits emergency operation to 500 hours/ annum.

Table S1.2 incorporates the maintenance and testing regime, which is less than 50 hours/ generator.

Emission limit values (ELVs) to air are not applicable to MCPs operating less than 500 hours per year.

Emergency 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. The Environment Agency expects planned testing and generator operations to be organised to minimise occasions and durations (subject to client requirements).

Each individual standby generator that is a new Medium Combustion Plant (MCP) is required to have stack monitoring for carbon monoxide (CO) and NOx, refer to monitoring section below.

Table S1.1 of the permit prevents any electricity produced at the Installation from being exported to the National Grid.

Table S1.2 incorporates operational and management procedures reflecting the outcomes of the air quality modelling by minimising the duration of testing, the duration and frequency of whole site tests and planning off-grid maintenance days and most importantly times/ days to avoid adding to any high ambient pollutant background levels.

The permit application has assessed and provided evidence of the reliability of the local electricity grid distribution allowing us to judge that the realistic likelihood of the plant needing to operate for prolonged periods in an emergency mode is very low.

Table S2.1 restricts the fuel to ultra-low sulphur gas oil or equivalent substitute as agreed in writing with the Environment Agency.

Tables S4.2 and S4.3 require annual reporting of standby engine maintenance run and any electrical outages (planned or grid failures regardless of duration) require both immediate notification to the Environment Agency and annual reporting.

Decision considerations

Confidential information

A claim for commercial or industrial confidentiality has not been made.

The decision was taken in accordance with our guidance on confidentiality.

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

The consultation requirements were identified in accordance with the Environmental Permitting (England and Wales) Regulations (2016) and our public participation statement.

The application was publicised on the GOV.UK website.

We consulted the following organisations:

- Local Authority - Environmental Protection Department (Air Quality Specialist)
- Local Authority - Planning Department
- Food Standards Agency
- Health and Safety Executive
- Director of Public Health & UK Health Security Agency (HSA) (formerly Public Health England (PHE))

The comments and our responses are summarised in the consultation responses section.

The regulated facility

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.

The site

The Operator has provided plans which we consider to be satisfactory.

These show the extent of the site of the facility including the emission and discharge points.

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 and baseline reporting under the Industrial Emissions Directive.

Nature conservation, landscape, heritage and protected species and habitat designations

We have checked the location of the application to assess if it is within the screening distances we consider relevant for impacts on nature conservation, landscape, heritage and protected species and habitat designations. The application is within our screening distances for these designations.

We have assessed the application and its potential to affect sites of nature conservation, landscape, heritage and protected species and habitat designations identified in the nature conservation screening report as part of the permitting process.

We consider that the application will not affect any site of nature conservation, landscape and heritage, and/or protected species or habitats identified.

We have not consulted Natural England.

The decision was taken in accordance with our guidance.

Environmental risk

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

The Operator’s risk assessment is satisfactory.

General operating techniques

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.

The operating techniques that the Operator must use are specified in table S1.2 in the environmental permit.

Operating techniques for emissions that screen out as insignificant

Emissions of nitrogen oxides (NOx), sulphur dioxide (SO_2), carbon monoxide (CO), particulate matter (with a diameter less than 10 microns (PM10)) and total organic carbon (TOC) as benzene have been screened out as insignificant, and so we agree that the Operator's proposed techniques are Best Available Techniques (BAT) for the Installation.

We consider that the emission limits included in the Installation permit reflect the BAT for the sector.

National Air Pollution Control Programme

We have considered the National Air Pollution Control Programme as required by the National Emissions Ceilings Regulations 2018. By setting permit condition 2.3.6, operation of generators in an emergency is limited to 500 hours per year. Furthermore, testing for each MCP is limited to 13 hours per engine per year. Therefore, emissions to air are minimised which will aid the delivery of national air quality targets. We do not consider that we need to include any additional conditions in this permit.

Updating permit conditions during consolidation

We have updated permit conditions to those in the current generic permit template as part of permit consolidation. The conditions will provide the same level of protection as those in the previous permit.

Raw materials

We have specified limits and controls on the use of raw materials and fuels.

Pre-operational conditions

Based on the information in the application, we consider that we need to include pre-operational conditions. The following pre-operational conditions (POs) have been included in the permit:

PO1 - Commissioning

The Operator shall submit an updated commissioning plan for the engines associated with Variation EPR/QP3706LH/V002 to the Environment Agency for approval. The plan shall provide timescales for the commissioning of the generators and shall demonstrate that the commissioning of the generators is covered within the site's permitted regular testing regime, thereby minimising durations and impacts.

We have included this pre-operational condition as the risk assessment submitted with the application does not cover the commissioning phase.

PO2 - Containment

The Operator shall undertake a review of all liquid storage, bunds and secondary containment at the site and submit a written report to the Environment Agency for assessment and written approval.

We have included this pre-operational condition to satisfy ourselves that the liquid storage, bunding and secondary containment is fit for purpose.

Improvement programme

Based on the information in the application, we consider that we need to include an improvement programme. The following improvement conditions (ICs) have been included in the permit:

IC3 - Monitoring plan - flue gas monitoring requirements

We have specified that the Operator shall have an updated written monitoring plan (including monitoring of emissions from engines associated with Variation EPR/QP3706LH/V002) to ensure that they comply with the monitoring requirements of the permit.

IC4 - Air Quality Management Plan (AQMP)

We have specified that the Operator shall have an updated written Air Quality Management Plan (AQMP) (including emissions from engines associated with Variation EPR/QP3706LH/V002) to manage the risks for prolonged emergency running of the plant and limit the duration of an outage event to less than 50 hours, as far as possible. 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.

IC5 - Short-term nitrogen oxides and dust concentrations - monitoring plan

We have specified that the Operator details their proposals and subsequently undertakes a monitoring programme to verify the predicted short-term nitrogen oxides (NOx) and dust concentrations at the boundary of the site or off-site locations of sensitive receptors as appropriate.

IC6 - Short-term nitrogen oxides and dust concentrations - monitoring report

We have specified that the Operator submits a report detailing the results and conclusions of the emissions monitoring undertaken as part of IC5. This will contribute to the validation of conclusions reached in the air quality assessment

and inform the air quality management plan. IC6 also requires the Operator to review the options for reducing the predicted emission impacts. The reduction measures are expected to achieve a reduction of impacts during both the maintenance/testing and emergency operations. In setting IC5 and IC6 we have considered the level of the NOx peaks predicted by the Operator's modelling.

Emission limits

No emission limits have been added, amended or deleted as a result of this Variation.

As the plant is limited to less than 500 hours of emergency operation by permit condition 2.3.3 and less than 50 hours for maintenance and testing in permit table S1.2, air emission limits are not applicable.

Monitoring

We have decided that monitoring should be carried out for the parameters listed in the permit, using the methods detailed and to the frequencies specified. In particular:

We have added monitoring of emissions of carbon monoxide from new emission points A9 to A48 (new MCP), with a minimum frequency of once every 1500 hours of operation or every five years (whichever comes first). This monitoring has been included in the permit in order to comply with the requirements of the Medium Combustion Plant Directive (MCPD) 2015 which specifies the minimum requirements for monitoring of carbon monoxide emissions, regardless of the reduced operating hours of the plant.

We have also added monitoring of emissions of nitrogen oxides (NOx) from new emission points A9 to A48 (new MCP), with the same frequency specified for the monitoring of carbon monoxide emissions. In setting out this requirement, we have applied our regulatory discretion, as we consider that this limited monitoring, to happen in concurrence with the carbon monoxide monitoring, is proportionate to the risk associated with the emissions of NOx from the Installation.

Taking into account the limited hours of operation of the engines operating at the Installation, and the fact that we are not setting emission limits for NOx and carbon monoxide, we consider this monitoring can be carried out in line with web guide 'Monitoring stack emissions: low risk MCPs and specified generators' Published 20 March 2024 (formerly known as TGN M5).

We have set an Improvement Condition (IC3) requesting the Operator to submit an updated monitoring plan (including monitoring of emissions from engines associated with Variation EPR/QP3706LH/V002) for approval by the Environment

Agency detailing the Operator's proposal for the implementation of the flue gas monitoring requirements specified in the permit.

For new MCP, we have set a requirement for the first monitoring to happen within 4 months of the issue date of the permit or the date when each new MCP is first put into operation, whichever is later (permit condition 3.5.2) unless otherwise agreed under Improvement Condition 3.

Reporting

We have added reporting in the permit for emissions to air for the new emission points A9 to A48 (new MCP).

We have specified reporting in the permit to ensure the site is operated to the standards specified in the Operating Techniques including the reporting of emissions to air.

We have specified reporting to ensure the Operator notifies us of any operation of the standby generators in emergency mode in response to national grid power outage.

Management system

We are not aware of any reason to consider that the Operator will not have the management system to enable it to comply with the permit conditions.

The decision was taken in accordance with the guidance on Operator competence and how to develop a management system for environmental permits.

Growth duty

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 Variation.

Paragraph 1.3 of the guidance says:

"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."

We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document 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.

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.

Consultation Responses

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 UK HSA

Brief summary of issues raised:

Recommendations that when considering appropriate permit conditions:

1. UKHSA's expectation is that the levels off-site in the event of a power failure, which will be many times those seen during staggered generator testing, are transparently provided and the levels compared to health standards for those off-site. The Operator could consider comparison with the US Environmental Protection Agency's (EPA) Acute Exposure Guideline Levels (AEGL) for Airborne Chemicals. For reference, the UK Health and Safety Executive's (HSE) EH40/2005 Workplace exposure limits (WELs) notes the Short-term exposure limit (15-minute reference period) nitrogen dioxide is 1.91 mg.m-3.

2. The Environment Agency should satisfy itself that the Operator has measures in place to manage both prolonged emergency-running of the generators, considering the potential for exceedance of the hourly NO_2 air quality standard during emergency operations, and also the prevention of short-term impacts on human receptors.

3. Reducing public exposures to non-threshold pollutants such as nitrogen dioxide to below air quality standards has potential public health benefits. We support approaches which minimise or mitigate public exposure to non-threshold air pollutants and address inequalities (in exposure) and encourage their consideration during site design, operational management, and regulation. This consultation response assumes 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:

With regard to appropriate permit conditions concerning the Operator's Air Quality Assessment the following applies:

- As described in more detail in the Air Quality Section above, the Operator submitted an Air Quality Risk Assessment that considered four main operational scenarios: two testing scenarios (monthly and six-monthly) and two emergency scenarios (outage) of 48 hours and 72 hours and the potential impact of those scenarios at 17 discrete human receptor locations, including residential properties, schools, leisure, commercial, industrial and retail.

- We audited the Operator's air quality assessment, including undertaking detailed check modelling and completing sensitivity analysis.

- We agree with the Operator's overall conclusions that the site is unlikely to cause an exceedance of an ES at human health receptors providing the electricity grid remains reliable.

- We have set improvement condition (IC6) to require the Operator to reduce NOx emissions further by reviewing the testing regime and assessing other opportunities to reduce emissions. The additional measures specified under IC6 are expected to achieve a reduction of impacts during both the testing and emergency operations.

With regard to appropriate permit conditions concerning appropriate measures to prevent or control pollution in accordance with the relevant sector guidance and industry best practice, the following applies:

- As described in more detail in the Protection of Land, Surface Water & Groundwater section above, the Operator has provided evidence of pollution control and/ or prevention. We have also included PO2 for the Operator to undertake a review of all liquid storage, containment and bunds at the site. This review will be carried out by a qualified structural engineer and will compare all containment and bunds against the standards set out in CIRIA guidance: Containment systems for the prevention of pollution (C736). We have included this PO to satisfy ourselves that the site containment and bunding is fit for purpose.

Representations from individual members of the public

Brief summary of issues raised:

1. The proposal to install 40 new generators that do not meet the 2G standard and do not have Selective Catalytic Reduction (SCR) fitted for a site located in an AQMA is unacceptable.

2. The site is located within an area of poor air quality with exceedances of the NO_2 standards. The current proposal is unacceptable and if approved would create a precedent for other data centre Operators to do the same and ignore the requirements from the EA FAQ document.

Summary of actions taken:

With regards to the new engines not meeting the 2G standard and not having SCR fitted for a site in an AQMA, the following applies:

- As described in more detail in the Point Source Emissions to Air section above, the Operator has taken measures to minimise emissions from the gas oil or equivalent fuel generators under emergency, testing and maintenance scenarios.

- Both the Data Centre FAQ Headline Approach v21 and Emergency backup diesel engines on installations: best available techniques (BAT) - GOV.UK (www.gov.uk) specifies the BAT emissions specification for new gas oil fired reciprocating engines as emissions optimised to 2g-TA Luft or US EPA Tier 2 or an equivalent. These are the international standards that we have concluded that we will use to infer what BAT is for sites.

- The Operator has confirmed that the additional generators to be used at the data centre are emissions optimised to meet the US EPA Tier 2 standard.

With regards to the site being located within an area of poor air quality with exceedances of the NO_2 standards, the following applies:

- As described in more detail in the Air Quality Section above, the Operator submitted an Air Quality Risk Assessment that considered four main operational scenarios: two testing scenarios (monthly and six-monthly) and two emergency scenarios (outage) of 48 hours and 72 hours and the potential impact of those scenarios at 17 discrete human receptor locations, including residential properties, schools, leisure, commercial, industrial and retail.

- We audited the Operator's air quality assessment, including undertaking detailed check modelling and completing sensitivity analysis.

- We agree with the Operator's overall conclusions that the site is unlikely to cause an exceedance of an ES at human health receptors providing the electricity grid remains reliable.

- We have set improvement condition (IC6) to require the Operator to reduce NOx emissions further by reviewing the testing regime and assessing other opportunities to reduce emissions. The additional measures specified under IC6 are expected to achieve a reduction of impacts during both the testing and emergency operations.