Permitting Decisions- Bespoke Permit

We have decided to grant the permit for GB One Data Centre operated by GTR Management Services Limited.

The permit number is EPR/CP3042QG

The application is for the operation of standby electricity generating combustion plant at a data centre in an industrial and commercial area of Slough, approximately 1.7km north-west of Slough town centre at national grid reference SU 95949 80764.

The combustion plant comprises:

- 21 diesel fired Kohler SDMO KD4500-E generators operating as standby backup generators each with a thermal input of 8.877 MWth.

- The combined net rated thermal input of all diesel backup generators on site is 186.417 MWth (21 x 8.877 MWth standby generators).

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 sulphur concentration 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. Email received on 11/08/2023 advising Environment Agency of change of fuel. Operator to use both diesel and HVO fuel in back-up generators. This change was agreed by us on 14/08/2023.

The default generator specification as a minimum for new plant to minimise the impacts of emissions to air (NOx) is 2g TA-Luft (or equivalent standard) or an equivalent NOx emission concentration of 2000 mg/m3. The operator has confirmed that the 21 to be used at the data centre are emissions optimised to 2g-TA Luft or US EPA tier 2 or equivalent. Additionally, an SCR NOx abatement system is installed, which reduces the NOx air emissions per generator from 1493 mg/Nm3 to 190 mg/Nm3.

Operation of the data centre combustion plant will be regulated as a Section 1.1 Part A (1) (a) activity under the Environmental Permitting (England and Wales) Regulations (EPR) 2016 for the burning of any fuel in an appliance with a rated thermal input of 50 or more megawatts (MW). The thermal input of the data centre is 186.417 MWth.

The generators will supply emergency power to the data centre in the event of National Grid failure. In non-emergency scenarios, they will be operated only for testing and maintenance purposes to an agreed schedule. They will not provide any electricity themselves to the National Grid and all electricity generated will be used within the data centre.

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

Purpose of this document

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

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

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

Read the permitting decisions in conjunction with the environmental permit.

Key issues of the decision

Nature of the site

The operator applied to permit GB One Data Centre in Slough. There are currently a significant number of data centres located in close proximity in the Slough area and as of August 2022 there were 26 data centres all located in the same area as shown below.

SLOUGH DATACENTERS
August 2022

Operator	Address	Size
Equinix LD4	2 Buckingham Avenue	66
Equinix LD5	8 Buckingham Avenue	121
Equinix LD6	352 Buckingham Avenue	92
Equinix LD7	1 Banbury Avenue	109
Equinix LD10	13 Liverpool Road	71
Equinix LD11x	756 Henley Road	96
NTT GDC EMEA Gyron	665 – 670 Ajax Avenue	35
CyrusOne London i	12 Liverpool Road	32
CyrusOne London iii	700 Stirling Road	58
CyrusOne London iv	225b Bath Road	100
CyrusOne London V	225c Bath Road	100
Cyxtera LO1 & LO5	628 – 635 Ajax Avenue	88
Virtus Lon4	14 Liverpool Road, Slough	60*
Virtus Lon3	Liverpool Road	60*
Virtus Lon9	470-474 Malton Avenue	132
Virtus Lon10	Buckingham Avenue	60*
Virtus Lon11	Ipswich Road	69
Iron Mountain LON-1	724-729 Dundee Road	
Iron Mountain Amazon LON-2	110 Buckingham Avenue	151
GB-One	Ajax Avenue	186
Rackspace LON3	115 Buckingham Avenue	
China Mobile	536 Ipswich Road	
Barclays Datacentre	672 Galvin Road	
O2 Telephonica	260 Bath Road	
O2	354 Buckingham Avenue	
UCB	Ajax Avenue	
Total		1,686

If the National Grid was to fail in this area, then the majority of the data centres connected to the same grid would go offline and their back-up diesel or equivalent fuel generators would be put into action. Therefore, in order to reduce the NOx air emissions to acceptable levels in the event of a national grid failure the operator has specified abated engines, which reduces NOx emissions from 1493 mg/Nm3 to 190 mg/Nm3 per generator.

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

Technology

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

They considered the following technologies:

- Diesel engines
- Gas turbines
- Aero engine gas turbines
- Gas engines

They compared these technologies against the following considerations:

- Start-up time
- Reliability

- Independence of off-system services
- Causing the least environmental impact

The operator demonstrated there were significant reasons for not selecting gas turbines, aero engine gas turbines and gas engines. Aero engine gas turbines, gas engines and diesel engines all provided the fast response speed required but the diesel engines had a significantly greater environmental impact than the gas turbines and engines.

Fuel

The operator further justified the choice of low sulphur diesel over gas as a fuel for the engines because it allowed the required level of resilience at the data centres. The storage of sufficient gas on-site as a fuel source was not possible due to restraints on available space. Additionally, there were increased health and safety risks associated with such storage. There would be a reliance on an off-site supply of gas, which would have to be provided to the sites via a pipeline operated and maintained by a third party. Should this supply of gas be interrupted there would be no emergency back-up generation for the sites, and as such would not meet the resilience requirements of the facilities.

From the options considered, the operator therefore demonstrated that low sulphur diesel engines were BAT to provide emergency/ standby power for the data centre on the basis that:

- The engines provide a fast response speed to the required load (fast start-up of standby generators for data centres is fundamental to their operation as an almost instantaneous supply of electricity is required in the event of power loss to the site).

- The need for a reliable supply of fuel (diesel) is essential to ensure resilience (the on-site storage of sufficient quantities of diesel fuel provides the required level of independent performance reliability on site).

- Diesel engines have low maintenance costs and replacement parts are readily available.

Email received on 11/08/2023 advising Environment Agency of change of fuel. Operator to use both diesel and HVO fuel in back-up generators. This change was agreed by us on 14/08/2023. NOx emissions are similar to diesel, but CO2 and particulates would be lower.

Based on this assessment and the fact that diesel or equivalent fuel generators are presently a commonly used technology for standby generators in data centres (Emergency backup diesel engines on installations: best available techniques (BAT) - GOV.UK (www.gov.uk)) we accept that low sulphur diesel or equivalent fuel fired generators can be considered BAT.

Managing emissions

Point Source Emissions to Air

The operator has taken measures to minimise emissions from the diesel or equivalent fuel generators both in emergency and test/ maintenance operation.

The Data Centre FAQ Headline Approach v21 specifies the BAT emissions specification for new diesel-fired reciprocating engines as 2g TA-Luft (or equivalent standard). This is the European standard that we have concluded that we will use to infer what BAT is for sites.

The operator has confirmed that the 21 generators that will be operated at the data centre in will be Kohler KD4500-E engines, and that these engines will conform to emissions standards 'TA-luft 2g' or Tier II USEPA.

The Data Centre FAQ states v21 that Tier II USEPA is the minimum appropriate for new generators, as such the KD4500-E are considered to be compliant to deliver NOx releases of no greater than 2,000 mg/m3. Additionally, an SCR NOx abatement system is installed, which reduces the NOx air emissions per generator from 1493 mg/Nm3 to 190 mg/Nm3.

Aqueous Releases from Sites

The data centre has separate foul and surface water drainage systems.

Point Source Emissions to Foul Sewer

The operator has confirmed that the Installation will be connected to the public foul sewerage network operated by Thames Water Limited and that there are no cesspits or septic systems present on site. The operator has confirmed that all discharges to foul sewer will comprise only sanitary effluent from domestic facilities present on site and no process effluent will be generated. The operation of the data centre does not result in the generation of trade effluent.

Point Source Emissions to Surface Water

The operator has confirmed that the Installation will be connected to the public surface water drainage sewer network operated by Thames Water Limited.

The surface water drainage system at the data centre will accept surface water runoff from the permitted area (standby generators and diesel or equivalent fuel storage areas). Surface water runoff collected will drain via oil interceptors.

Following the interceptors, the surface water runoff will discharge into soakaways and then off-site into the public surface water drainage system operated by Thames Water Limited, the connection for which is in Ajax Avenue. The surface water point source discharge points into this connection are referenced as SW1, SW2 and SW3 on the Plan in Schedule 7 of the permit. The surface water drainage discharges to unnamed surface water ditches and ultimately into the Jubilee River, a tributary of the River Thames.

Discharges to surface water include:

- Uncontaminated rainwater from roof areas.
- Uncontaminated runoff from paved yard and car parking areas.
- Uncontaminated water from the oily water interceptor associated with the tanker loading bay.

There are 3 oil/ water interceptors at the site. The main interceptor covering the area of the tank farm, loading bay and surrounding hardstanding is a Class 1 full retention interceptor with an oil capacity of 10,000 litres. This interceptor has a shut off valve which is automatically triggered by the oil probe in the interceptor.

Areas of hard surfacing away from the tank farm and loading bay are discharged through a separate surface water system which discharges through Class 1 bypass interceptors with an oil capacity of 60 litres. These 2 lower risk interceptors are alarmed (linked to the data centre control centre) but do not have valves present.

The interceptors will be emptied, cleaned and maintained regularly. Drainage systems will be maintained in good condition and regularly cleaned/ inspected to prevent blockages.

Monitoring of the surface water discharges from the data centre is not considered necessary given the planned preventative maintenance system which includes regular emptying and maintenance of the oily water interceptor.

Point Source Emissions to Land

The operator has confirmed that there will be point source emissions to land from the Installation in the form of soakaways.

There are 3 soakaways present at the installation beneath the southern car parking areas. The soakaway point source discharge points are referenced as SL1, SL2 and SL3 on the Plan in Schedule 7 of the permit

The “milk crate” type soakaways are situated between the 3 interceptors and the final outfall to the public surface water drainage network on Ajax Avenue.

The soakaways are plastic crates with a geotextile liner between the crates and the surrounding gravel fill. The system is required to slow the release of surface water to the surface water sewer system. The soakaways will not require maintenance. Given their cellular structure it would be difficult to insert a drainage camera.

As the operator has confirmed that no process effluent or contaminated emissions would be discharged from the site to sewer or surface water drainage, we accept that Application Form B6 and consultation with our water quality specialists is not needed.

Air Quality

For combustion applications, we normally require the operator to submit a full air dispersion model as part of their application. Air dispersion modelling enables the process contribution (PC) to be predicted at any environmental receptor that might be impacted by the plant.

Once short term (ST) and long term (LT) PCs have been calculated in this way, they are compared with Environmental Standards (ES). ES are described in our web guide ‘Air emissions risk assessment for your environmental permit’.

Our web guide sets out the relevant ES as:

- Ambient Air Directive Limit Values
- Ambient Air Directive and 4th Daughter Directive Target Values
- UK Air Quality Strategy Objectives
- Environmental Assessment Levels

Where an Ambient Air Directive (AAD) Limit Value exists, the relevant standard is the AAD Limit Value. Where an AAD Limit Value does not exist, AAD target values, UK Air Quality Strategy (AQS) Objectives or Environmental Assessment Levels (EALs) are used. Our web guide sets out EALs which have been derived to provide a similar level of protection to Human Health and the Environment as the AAD limit values, AAD target and AQS objectives. In a very small number of cases, e.g., for emissions of lead, the AQS objective is more stringent that the AAD value. In such cases, we use the AQS objective for our assessment.

AAD target values, AQS objectives and EALs do not have the same legal status as AAD limit values, and there is no explicit requirement to impose stricter conditions than BAT in order to comply with them. However, they are a standard for harm and any significant contribution to a breach is likely to be unacceptable.

PCs are screened out as Insignificant if:

- The long-term PC is less than 1% of the relevant ES; and
- The short-term PC is less than 10% of the relevant ES.

The long term 1% PC insignificance threshold is based on the judgements that:

- It is unlikely that an emission at this level will make a significant contribution to air quality;
- The threshold provides a substantial safety margin to protect health and the environment.

The short term 10% PC insignificance threshold is based on the judgements that:

- Spatial and temporal conditions mean that short term process contributions are transient and limited in comparison with long term process contributions;
- The threshold provides a substantial safety margin to protect health and the environment.

Where an emission is screened out in this way, we would normally consider that the operator's proposals for the prevention and control of the emission to be BAT. That is because if the impact of the emission is already insignificant, it follows that any further reduction in this emission will also be insignificant.

However, where an emission cannot be screened out as insignificant, it does not mean it will necessarily be significant.

For those pollutants which do not screen out as insignificant, we determine whether exceedances of the relevant ES are likely. This is done through detailed audit and review of the operator's air dispersion modelling taking background concentrations (Process Contribution + Background Concentration = Predicted Environmental Concentration (PEC)) and modelling uncertainties into account. Where an exceedance of an AAD limit value is identified, we may require the operator to go beyond what would normally be considered BAT for the Installation or we may refuse the application if the operator is unable to provide suitable proposals. Whether or not exceedances are considered likely, the application is subject to the requirement to operate in accordance with BAT.

This is not the end of the risk assessment, because we also take into account local factors (for example, particularly sensitive receptors nearby such as a SSSIs, SACs or SPAs). These additional factors may also lead us to include more stringent conditions than BAT.

If, as a result of reviewing of the risk assessment and taking account of any additional techniques that could be applied to limit emissions, we consider that emissions would cause significant pollution, we would refuse the Application.

Operator's assessment of potential impact on air quality:

The operator submitted an Air Emissions Risk Assessment which considered the potential impacts of the principal pollutants of concern with respect to emissions to air from low sulphur diesel oil generators. The principal pollutants of concern are nitrogen dioxide (NO2) on human health and nitrogen oxides (NOx) and nutrient and acid nitrogen deposition on ecological receptors within the defined screening distances. However, as the generators will be installed with Selective Catalytic Reduction (SCR) technology to control the NOx emissions; the assessment also considered the potential for emissions of ammonia (NH3) associated with slippage.

They considered 12 human health receptors including residential properties, gyms, schools and day nurseries.

They considered the following protected European sites:

- Burnham Beeches (Special Area of Conservation (SAC))

- Windsor Forest & Great Park (SAC)
- South West London Waterbodies (Special Protection Areas (SPA))
- South West London Waterbodies (Ramsar Site)

and the following local sites:

Local Nature Reserves (LNR):

- Haymill Valley

Local Wildlife Sites (LWS):

- Railway Triangle (off Stranraer Gardens)
- Haymill Valley
- Jubilee River and Dorney Wetlands

The data centre is not situated in an Air Quality Management Area (AQMA), but there are AQMAs within 2km of the site. The closest AQMA is Slough AQMA No. 3 Extension. This is located 347m south east of the data centre.

The operator assessed **three** scenarios:

Scenario 1: Routine maintenance/ testing - As part of the testing and maintenance regime, the generators will be tested monthly for an hour, totalling 12 hours per year per generator. The annual mean and 1-hour mean impacts of the 21 generators have been modelled for 12 hours of routine testing and maintenance per generator. The 1-hour mean has been assessed by assuming constant operation of each bank of generators separately as tested monthly in groups of three or four.

An email from the operator dated 21st June 2023 confirmed that the generators will be tested individually for 30 minutes every fortnight, and that the modelling was done in banks of three and four to provide a conservative assessment. However, the emission rate for 30 minutes of testing is greater than the emission rate for an hour of testing as a higher proportion of time is unabated.

Scenario 2: Electrical grid outage of 24 hours - All generators (minus redundancies) operate simultaneously across the site for 24 hours.

Scenario 3: Electrical grid outage of 72 hours - All generators (minus redundancies) operate simultaneously across the site for 72 hours (worst case scenario).

They made the following assumptions regarding the maintenance and operational scenarios to ensure a conservative assessment was undertaken:

- The assessment of short-term impacts assumes constant operation of the plant in banks of three or four across a range of meteorological conditions.
- The results presented are the maxima from modelling with five separate years of meteorological data.
- The results presented are the maxima from modelling both with and without including surrounding buildings within the dispersion model.
- The assessment assumes that the SCR technology takes 15 minutes to be fully effective.
- The assessment has considered ammonia slip, assuming an emission concentration of 10 mg/Nm3, however, the manufacturers have guaranteed that there will be no ammonia slip.

- For the emergency loss-of-offsite power scenarios, the assessment assumes that every hour includes 15 minutes of unabated emissions, whereas in reality, this will only be the case for the very first hour.

- Depletion has not been included in the model. This will cause a tendency for impacts to be over-predicted.

- A conservative approach has been taken to calculating NO2 concentrations from modelled NOx concentrations.

Their conclusions were:

Impact on Human Health Receptors

Scenario 1: Routine maintenance/ testing

- Annual Mean - The PCs are all less than 1% of the long-term AQS; the PCs are, therefore, insignificant. There is thus negligible risk that the NO2 annual mean AQS will be exceeded as a result of routine testing and maintenance of the generators. On this basis, the long-term effects are considered to be not significant.

- 1 Hour Mean - Assuming continuous operation, the PC exceeds 10% of the short-term AQS at all specific receptor locations; however, the PECs will remain below the AQS at the majority of receptors. At Receptor R12 (Astoria Heights Apartments on A355) where the PEC exceeds the AQS, the probability of an exceedance, assuming that the testing regime takes place across 72 hours (six banks of generators, each being tested for one hour every month), is calculated to be less than 1%. The Environment Agency guidance is, therefore, that a risk of an exceedance is highly unlikely.

- Based on the regular testing and maintenance programme, there is negligible risk that the AQS will be exceeded as a result of the facility.

Scenario 2: Electrical grid outage of 24 hours

- 1 Hour Mean - Assuming continuous operation for 24 hours as a result of an emergency loss of power scenario, the PECs exceed the AQS at the majority of receptors.

- Assuming a 24-hour scenario, the probability of an exceedance is calculated to be less than 1% at all specific receptors, equivalent to an exceedance less than once every 100 years. The Environment Agency guidance is, therefore, that a risk of an exceedance is highly unlikely.

- An exceedance of the hourly AQS is considered unlikely during a 24-hour loss-of-offsite power scenario.

Scenario 3: Electrical grid outage of 72 hours

- 1 Hour Mean - Assuming continuous operation for 72 hours as a result of an emergency loss of power scenario, the PECs exceed the AQS at the majority of receptors.

- Assuming a 72-hour scenario, the probabilities of an exceedance are greater than for the 24-hour scenario; however, for the majority of receptors, the probabilities are still less than 1%. At Receptor R4 (Residential property on Buckingham Avenue East) the probability of an exceedance is 4.7%, thus an exceedance of the hourly AQS is unlikely over a 21-year period. At Receptors R11 (Judds House on Whitby Road) and R12

(Astoria Heights Apartments on A355), where the probabilities of an exceedance are 7.1% and 8.9%, respectively, an exceedance is possible every 11 – 14 years.

The operator modelled the 72-hour emergency scenario at the Environment Agency's request as 72 hours is the Environment Agency's worst-case standard for data centres. The operator provided this along with their considered worst case of 24 hours.

Impacts on Ecological Receptors

Scenario 1: Routine maintenance/ testing

- During routine operation, the maximum PCs are less than 1% of the long-term AQS and less than 10% of the short-term AQS at internationally-designated habitats, and less than 100% of the long-term and short-term AQS at nationally-designated habitats. The Environment Agency guidance is thus that these PCs are insignificant regardless of the PEC.

Scenario 2 & 3: Electrical grid outage of 24 & 72 hours

- During the emergency scenario, the maximum 24-hour mean NOx PECs at the internationally-designated habitats are below the AQS. At the nationally-designated habitats, the PCs are less than 100% at the majority of habitats, thus the PCs are insignificant; the exception is an area of Haymill Valley LNR and LWS, where the PCs and PECs exceed the AQS. However, this is based on the assumption that every hour includes 15 minutes of unabated emissions. Accounting for the actual mass emissions, the PCs at Haymill Valley are insignificant.

These modelled electrical outages are most probably worst case as the operator stated in their Supporting Document that, 'The electricity supply arrangements for the site include two 33KV feeds from the National Grid, either of which can serve the 'customer load'.

The operator also carried out further research into National Grid outages in England and stated in their BAT Assessment that, 'UK Power Network figures show reliability of 99.99997% overall reliability. No long-term power loss events have been reported in the Slough area in the last 5 years.'

Provided power outages continue to be unlikely the risk of an air quality exceedance from emergency operation is low.

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

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 operator which included:

- Testing Scenario 2: the generators are tested individually for 30 minutes once a fortnight (total 12 hours per generator per year).
- Meteorological data observed at Heathrow Airport between 2016 and 2020.
- Our own terrain data.
- Additional human health receptors.
- Our own background data as a reasonable worst case.
- Surface roughness representing urban land use.

Human Health Assessment

As a result of our checks, although we do not fully agree with the operator's numerical predictions, the outcome of our checks indicates that the PCs from the facility are **unlikely** to

cause or contribute to exceedances of the relevant ES at human health receptors for the testing and emergency scenarios.

Testing Scenario 1 modelled by the operator is different to the testing scenario the operator is proposing to follow at the facility. Therefore, the results of the operator's modelling are likely to over-predict the hourly NO2 PCs, and underpredict the annual NO2 PCs. We have modelled both testing scenarios, with a focus on Testing Scenario 2.

We find:

- Testing Scenarios - The PCs are above the insignificance criteria of 10% for hourly NO2. PECs are unlikely to exceed 100% of the ES for Testing Scenario 2, when the generators are tested individually. If the generators are tested in banks of three or four, as described by Testing Scenario 1, PECs could exceed 100%. Using a probability analysis, hypergeometric distribution, we predict the probability of an exceedance of the hourly mean NO2 ES is less than 1% and that exceedances are highly unlikely.

- Emergency Scenarios - The PCs are above the insignificance criteria of 10% for ST NO2, NO2 AEGL-1 and ST NO. We predict that only the PECs for ST NO2 have the potential to exceed the ES. Our probability analysis indicates that exceedances of the hourly mean NO2 ES are unlikely for this scenario, based on a worst-case 72-hour operational period.

- Annual Mean - NO2 PCs from both testing scenarios are 'insignificant'. Annual mean NO2 PCs from the emergency and testing scenarios combined are 'not insignificant'. PECs are likely to exceed the ES if a 72-hour grid failure was to occur, although historical grid reliability data shows that is unlikely.

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 indicates that the PCs from the facility are **unlikely** to cause or contribute to exceedances of the relevant ES at ecological receptors for the testing and emergency scenarios.

We find:

- Testing Scenarios - Unlikely to make a significant contribution or cause an exceedance of any critical loads and levels at ecological receptors.

- Emergency Scenario - Unlikely to make a significant contribution to or cause an exceedance of the NOx annual critical level, NH3 annual critical level or the nutrient nitrogen and acid deposition critical loads. We cannot rule out an exceedance of the daily mean NOx critical levels of 75 µg/m3 and 200 µg/m3 at the Railway Triangle LWS as a result of 72 hours of emergency operation. However, we consider the likelihood of exceedances occurring as a result of a major grid failure to be low on the basis that historical data indicates that power outages have been rare.

- We consider exceedances of the daily mean NOx critical level to be unlikely, provided the grid reliability at the facility remains high.

We agree with the operator's overall 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.

Protection against Power Outage and Minimisation of Generator Operation

The largest risk of gaseous emissions from the site occurring which could impact human health or ecological receptors would be if the diesel or equivalent fuel generators had to operate for any significant period of time following a National Grid failure.

To address this scenario and minimise emissions, the operator:

- Has designed the data centre with a total of 3 blocks which operate independently. Each of these blocks has 7 generators operating on an n+1 arrangement to allow each block to be operated by separate clients, though all 7 generators could be simultaneously operational if required.

- Has designed the data centre so that in the event of an electrical failure the required number of generators at the data centre would operate to meet the customer load at that particular time.

- Has designed the data centre so that the n+1 arrangement for each data centre block means that in the event of power loss, all 7 generators would start up. As the customer load was met, generators would disengage sequentially to the level of demand. Should a generator fail, the backup (+1) generator would engage.

- Utilises an array of batteries in each block, uninterruptable power supply (UPS). These battery arrays can provide almost instantaneous electrical power in the event of a loss of site electrical feed. Sufficient UPS capacity is in place to provide operation of the data centre while the generators are brought online.

- Has developed multiple electrical feed connections. The electricity supply arrangements for the site include two 33KV feeds from the National Grid, either of which can serve the 'customer load'.

- Has developed automated systems which detect fluctuations in the electrical supply to the site, where such events could negatively impact data centre operation then the UPS can be automatically utilised, and generators brought online as required.

- Has the opportunity of utilising Slough Heat and Power electricity power station nearby. This provides power to the wider Slough Estate, in addition to the local generator capacity within the data centre.

- Maintains robust site security systems such as security fencing to restrict access and will have secure access arrangements to minimise the risk of any form of unauthorised access that could affect operation and cause the need for the generators to be operated. The data centre will also be manned 24 hours a day by facilities management personnel.

Containment and Prevention of Pollution to Ground, Surface water and Groundwater

Fuel Storage, Distribution and Containment

The operator has demonstrated that there are robust systems in place for the containment of fuel.

Diesel or equivalent fuel will be stored at the data centre in day (belly) tanks which are integral to the individual generator. Fuel storage - There are 21-day tanks on site and each stores approximately 1,000 litres of fuel. Therefore, there is a total of 21,000 litres of fuel (21 generators @ 1,000 litres = 21,000 litres) stored in the day tanks.

There will also be a centralised bulk above ground tank storage farm for diesel or equivalent fuel in the north-western corner of the installation boundary. Fuel storage - There are 6 fuel storage tanks on the bulk tank farm and each fuel storage tank is approximately 155,000 litres capacity. Therefore, there is a total of 930,000 litres of fuel (6 tanks @ 155,000 litres = 930,000 litres) stored in the tank farm.

The total capacity for fuel storage on this site is 951,000 litres.

This amount of fuel is needed on site as it will keep the generators running at full capacity for up to 48 hours assuming N operation (this means 18 generators. Site is n+1 so 21 generators of which 3 are failsafe protection). Contractual arrangements with customers require this period of availability without recourse to tankered deliveries which may not be guaranteed.

Containment Protection - Generator Day Tanks (Belly Tanks)

Each generator will be housed within proprietary steel container units located outside each Block. The generator container units will be raised off ground level on steel frames, which will act to protect the container units from vehicular damage.

Within the container unit for each generator will be a day tank integral to the container unit, this will automatically supply diesel or equivalent fuel to the generator.

The day tanks will be filled directly from bulk storage diesel or equivalent fuel tanks located on the site. The day tanks will be fed through underground lines from the bulk tank farm. Each Block is fed from two tanks, using two underground fuel supply lines, to ensure maximum redundancy.

• Block 1 will be fed from two underground lines from Tank 1A and Tank 1B

• Block 2 will be fed from two underground lines from Tank 2A and Tank 2B

• Block 3 will be fed from two underground lines from Tank 3A and Tank 3B

The day tanks will have the following protection measures to ensure no loss of containment:

- The day tanks are integrally bunded (110%) steel tanks complying with the Control of Pollution (Oil Storage) (England) Regulations 2001.
- Fuel storage areas will be subject to daily visual inspections as part of daily operational activities.
- Fuel supply line connections to the day tanks connect individually to a manifold where the piped supply to each generator becomes a steel 2-inch pipe within a 4 inch pipe to provide spill protection. The pipelines are hard connected to the day tank fill manifold, with isolating valves in place to permit isolation and maintenance. They are not left disconnected.
- Connection points and valves have a fill point with drip tray beneath. Furthermore, the entire generator enclosure base is a sealed bund, providing additional capacity for leaks.
- All fill point cabinets are lockable and kept locked when not in use. All fill point cabinets have drip trays.
- High and high high sensors and alarms, which will shut off the pumps to prevent over-filling.
- Low level alarms will trigger an investigation.
- Leak detection alarms and tank level gauges are in place on the day tanks.

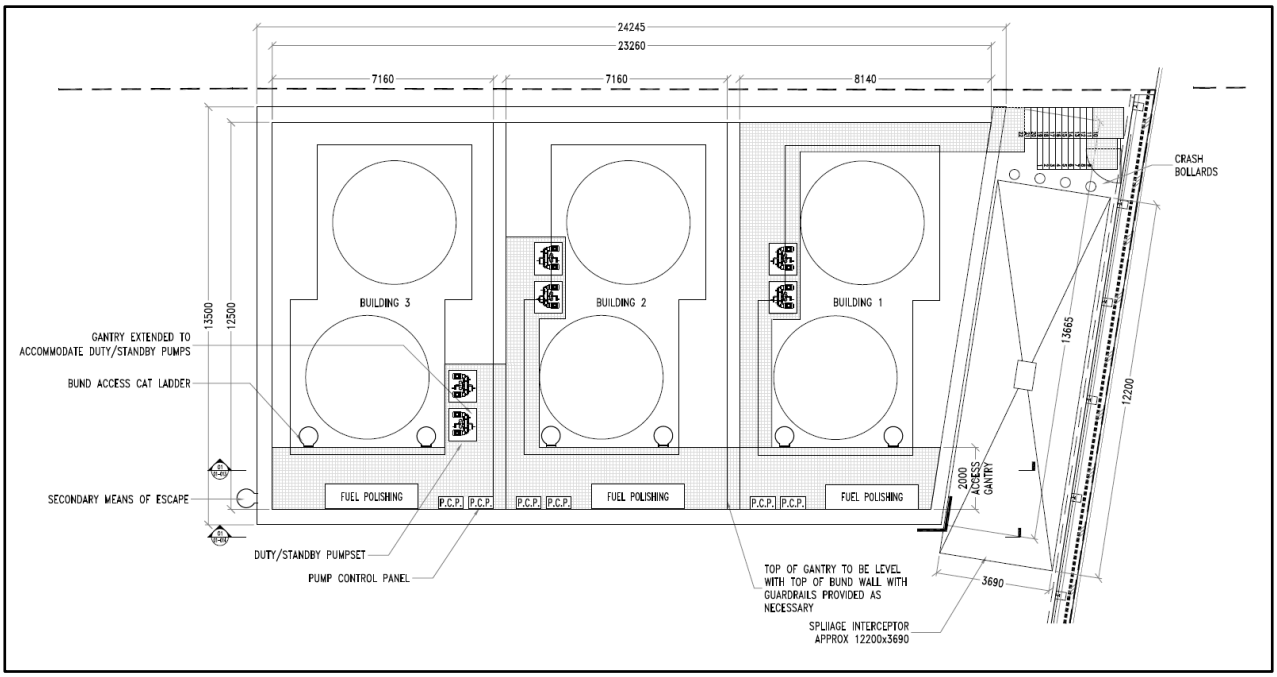
- The steel tanks are factory painted to prevent corrosion and there will be periodic inspection of the tanks as part of the planned preventative maintenance system in line with manufacturer's recommendations.

- A planned preventative maintenance programme will be in place to ensure equipment and infrastructure (e.g. bunds, surfacing, pipework) are in good condition.

- Spill kits will be available for use in the unlikely event of an unplanned fuel release. A spill procedure will be developed for the site as part of the Environmental Management System.

Containment Protection - Bulk Tank Farm

There will also be a centralised bulk above ground tank storage farm for diesel or equivalent fuel in the north-western corner of the installation boundary.



The bulk tank farm will have the following protection measures to ensure no loss of containment:

- The bulk storage tanks are double skinned (integrally bunded) steel cylindrical upright tanks and have been designed in line with current standards.

- Tertiary bund - Capacity of at least 110% of the largest container to meet the Control of Pollution (Oil Storage) (England) Regulations 2001. The bund is designed to hold groups of tanks, i.e. Tank 1 and 2 are together in the same bund, to maintain independence from the other Blocks. The bund capacity is 110% per 2 tanks.

- The steel tanks are factory painted and are raised from the base of the bund on concrete plinths to reduce contact with rainwater to prevent corrosion. There will also be periodic inspection of the tanks as part of the planned preventative maintenance system in line with manufacturer's recommendations.

- External areas and areas surrounding the diesel or equivalent fuel storage tanks will be laid down to hardstanding, hence reducing the risk of pollutants percolating into the ground and provided with surface water drains to collect and discharge contaminated water run-off through the on-site interceptors before discharging to the public surface water sewer. The drainage system will be maintained in good condition and regularly

cleaned/ inspected to prevent blockages. The inspection will be via CCTV survey at a frequency to be agreed, e.g. every five years, or as issues are detected.

- Poured concrete walls with appropriate joints to prevent weak points and seepage.

- Fill points located in a lockable cabinet provided with a drip tray designed to capture minor spillages during hose connection/disconnection. The fill point cabinet will be kept locked shut when deliveries are not taking place.

- High and high high sensors and alarms, which will shut off the pumps to prevent over-filling.

- Low level alarms will trigger an investigation.

- Leak detection alert via an alarm.

- Overpressure valves.

- Fuel polishing systems, to maintain fuel quality.

- Manually operated pumps to remove uncontaminated rainwater - Rainwater is pumped out over the top of the bund through a pipe which is situated into the bund sump. There is no pipework penetrations of the bund walls or floor with the exception of the underground fuel lines which have been flanged and sealed as per the manufacturer's specifications. There is an oil probe in the sump which will prevent the rainwater pump operating if oil is detected even if the manual key switch is pressed. This cannot be overridden and would require tanker emptying of the bund and cleaning of the sump and probe. The pump outfall on the outside of the bund is routed through a filter to capture any leaves etc. before discharge to the surface water sewer before the 10,000 litre interceptor.

- Areas where fuel is to be stored will be subject to daily visual inspections as part of daily operational activities.

- A planned preventative maintenance programme will be in place to ensure equipment and infrastructure (e.g. bunds, surfacing, pipework) are in good condition.

- Spill kits will be available for use in the unlikely event of an unplanned fuel release. A spill procedure will be developed for the site as part of the Environmental Management System.

Containment Protection - Underground Pipelines

The underground pipelines connect each Block to the bulk tank farm. Given the space constraints on the site an above ground pipeline system was not considered practical and could increase the likelihood of a vehicle collision with the pipeline.

The underground pipelines will have the following protection measures to ensure no loss of containment:

- The underground fuel lines are Brugg Secon -X pipes. These are flexible, double-walled and bendable composite piping system with an inner pipe made of stainless steel and an encasing mantle pipe made of PE separated by struts. This pipe system was specially developed as a fuel carrier pipe for petrol stations.

- Each pipeline is connected to a vacuum system which can detect leaks at very low concentrations. Should a leak be detected, an alarm is raised, and the pipeline can be

isolated, and the secondary pipeline remains operational while the leaking pipeline is drained, and investigations are undertaken.

- Each length of pipeline is expected to be one continuous piece of pipeline, with no joints. Should an intermediate jointing pit be required, it will be a sealed chamber with manhole access above.

Containment Protection - Tanker Unloading Bay

The tanker unloading bay will have the following protection measures to ensure no loss of containment:

- The tanker unloading bay is an engineered concrete area which drains to a central point, where a sealed collection sump is present for use in the event of a spill during delivery. The sump beneath the unloading bay is sized at 7,000 litres, equal to a single compartment of a multi-compartment fuel delivery tanker. This sump is connected to the drainage system via a lockable penstock valve, which is kept closed during filling operations.

- Although Section 5.4.4 of CIRIA C736 recommends removal of penstocks where they drain to interceptors, the operation of penstocks will be tightly controlled by a checklist completed by the facilities manager and delivery driver for every delivery. Furthermore, the interceptor has an isolator valve at the outfall triggered by the oil probe in the interceptor, providing an additional layer of protection on any spillages leaving the site. Visual checks on the tanker bay will be carried out before opening the penstock following completion of deliveries.

- A tanker unloading procedure will be documented within the EMS which includes the process for draining the sump of uncontaminated rainwater, and processes to deal with fuel spills and leaks.

- A planned preventative maintenance programme will be in place to ensure equipment and infrastructure (e.g. bunds, surfacing, pipework) are in good condition.

- Spill kits will be available for use in the unlikely event of an unplanned fuel release. A spill procedure will be developed for the site as part of the Environmental Management System.

- Fuel loading and unloading activities will be conducted in line with best practices. This is not expected to eliminate the potential for accidental spillages, but they are expected to limit the duration of such event and therefore the potential consequences.

- Deliveries will take place from tankers in a bunded fuel unloading area to the main top up tanks.

- Approved suppliers will be arranged for the delivery of diesel or equivalent fuel, which will be undertaken in accordance with delivery procedures which will be developed as part of the Environmental Management System.

Tertiary containment is provided by the hardstanding of the external areas of the tank storage area and unloading bay.

External areas surrounding the diesel or equivalent fuel storage tanks will be laid down to hardstanding and provided with surface water drains to collect and discharge contaminated water run-off through the on-site interceptors before discharging to soakaways and the public surface

water sewer. Drainage systems will be maintained in good condition and regularly cleaned/ inspected to prevent blockages. The tank storage area also has bunding and poured concrete walls with appropriate joints to prevent weak points and seepage minimising the risk of an unplanned release of diesel or equivalent fuel leaving the site. Additionally, should diesel or equivalent fuel enter the surface water drainage system there is an on-site interceptor present.

External areas surrounding the tanker unloading bay will be laid to engineered concrete which drains to a central point, where a sealed collection sump is present for use in the event of a spill during delivery. The sump beneath the unloading bay is sized at 7,000 litres, equal to a single compartment of a multi-compartment fuel delivery tanker. This sump is connected to the drainage system via a lockable penstock valve, which is kept closed during filling operations. Additionally, deliveries will take place from tankers in a bunded fuel unloading area minimising the risk of an unplanned release of diesel or equivalent fuel leaving the site.

Noise

Noise is not a significant aspect of data centre permitting (noting that it is only the standby generators and associated diesel 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. As this is a new installation it is not possible to consider the likelihood of overnight operation by examining the frequency of historical outages, but the potential for prolonged power outages in the area is considered to be low.

However, the operator has carried out a Noise Impact Assessment for the operation of the Kohler KD4500-E generators at the data centre.

Operator's assessment of potential noise impact:

The operator submitted a Noise Impact Assessment which considered the potential impacts of noise emissions on the nearest residential Noise Sensitive Receptors (NSRs) and commercial premises with respect to the operation of Kohler KD4500-E generators.

The operator included the following sources of noise generation per building:

- 16No. 'low-noise' chillers (not regulated)
- 43No. direct expansion (DX) air conditioning units (not regulated)
- 10No. air handling units (AHUs) (not regulated)
- 7No. 4.5 MVA emergency generators
- Sound break-out through building envelope

They considered 2 residential receptors and 6 commercial receptors.

The operator assessed **two** scenarios:

Normal operations and emergency operations.

Their conclusions were:

Impact on Residential Receptors

Normal and Emergency Operations

- Once contextual factors have been considered, an "Indication of Low Impact depending on the context" for the daytime (07:00 – 23:00hrs) and night-time (23:00 – 07:00hrs) during normal and emergency operations.

- Importantly, the assessment assumes that plant noise does not contain impulsive components.

- During the daytime and night-time, the predicted operational noise levels are considered to be below the Lowest Observable Adverse Effect Level (LOAEL) by reference to Planning Practice Guidance-Noise (PPG-N). Under such circumstances PPG-N advises that the action is “No specific measures required”.

Impact on Commercial Receptors

Normal and Emergency Operations

- Predicted internal noise levels at neighbouring commercial premises indicate compliance with BS8233 Criteria for an ‘executive office’.

- During the daytime and night-time, the predicted operational noise levels are considered to be below LOAEL by reference to PPG-N. Under such circumstances PPG-N advises that the action is “No specific measures required”.

Environment Agency review of operator’s assessment of potential noise impacts

We have carried out our own audit by means of detailed check modelling and sensitivity analysis on the Noise Impact Assessment (NIA) presented by the operator.

In this assessment we only assessed the permitted activity of the back-up generators. The operator states that there is a low impact at nearby residential receptors.

As a result of our checks, although we do not fully agree with the operator’s numerical predictions, we agree with the operator’s overall conclusions that the sound emissions from the diesel generators on site are likely to be low risk.

Based on our assessment, we have not required a Noise Management Plan (NMP) as part of this determination. 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.

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.

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

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 - Planning Department
- Local Authority - Environmental Health Department
- Health and Safety Executive
- Sewerage Authority
- 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.

Operator

We are satisfied that the applicant (now the operator) is the person who will have control over the operation of the facility after the grant of the permit. The decision was taken in accordance with our guidance on legal operator for environmental permits.

The regulated facility

We considered the extent and nature of the facility at the site in accordance with RGN2 'Understanding the meaning of regulated facility', Appendix 2 of RGN2 'Defining the scope of the installation', and Appendix 1 of RGN 2 'Interpretation of Schedule 1'.

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.

See key issues for more discussion on the nature of the site.

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 discharge points.

The plan is included in the permit.

Site condition report

The operator has provided a description of the condition of the site. During consultation with Environment Agency groundwater and contaminated land teams, it was deemed necessary that further information should be supplied to ensure that the Environment Agency has sufficient information relating to the condition of the site at permit issue. We have therefore, included a pre-operational condition in order to satisfy this requirement.

It is also noted that during consultation with Environment Agency groundwater and contaminated land teams that there were concerns regarding the decommissioning of the site investigation boreholes.

The operator confirmed in an email dated 02/10/2023 that:

- The trial pits and hand dug pits were filled in upon completion of the sampling.
- The cable percussive boreholes (15m bgl) and the dynamic sampler boreholes (5m to 6m bgl) were not decommissioned by Delta-Simons following the investigation. The principal contractor has filled these during excavation and slab pouring.
- Boreholes CP102, CP103, CP104 and CP105 are beneath the main concrete slab of the data halls and so are unlikely to be a direct route to ground for any leaks or spills.
- Borehole DS112 is beneath the area of the tank farm and tanker bay which has necessitated the digging out of a substantial area of ground to fit the concrete bases and pads needed for this, which included part filling and concreting over the old borehole location. All areas in the vicinity of this borehole are covered with concrete and or tarmac surfacing and drained to the interceptor.

The Environment Agency do not agree that the site investigation boreholes have been decommissioned in the required manner. Therefore, these boreholes could allow preferential pathways if the slab and/ or upper filled parts of the boreholes were to be compromised at any time in the future, or if the boreholes bridge 2 sub-aquifers. These points of vulnerability will need to be thoroughly investigated at the time of surrender of the permit or at an earlier time. The information on the location of the boreholes is in documents: Application Bespoke Site Plan Baseline Report 15072022 and Application Bespoke SCRET - GWCL Response - 16052023 on DMS.

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 oxides of nitrogen, carbon monoxide, sulphur dioxide, particulate matter and ammonia 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 emission limit values in line with technical guidance we are minimising emissions to air. This will aid the delivery of national air quality targets. We do not consider that we need to include any additional conditions in this permit.

Raw materials/ fuels

We have specified limits and controls on the use of fuel.

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 have been included in the permit:

1 - which requires the operator to submit a written watching brief report to the Environment Agency for assessment and written approval. The report must contain, but not necessarily be limited to information on the condition of the land during the demolition and construction phases, particularly in the area of the historical tanks. This report should be submitted 4 weeks before operation commences. We have included this pre-operational condition to satisfy ourselves that there was no contamination encountered during the demolition and construction phases under the watching brief, anywhere on site including the area of the former tanks.

2 - which requires the operator to undertake a review of all bunds at the site and submit a written report to the Environment Agency for assessment and written approval. The review shall be carried out by a qualified structural engineer and compare all bunds against the standards set out in CIRIA guidance: Containment systems for the prevention of pollution (C736). The report must contain the findings and recommendations of the review including timescales for implementation of any improvements identified, and a maintenance and inspection regime. This review should be submitted 4 weeks before operation commences. We have included this pre-operational condition to satisfy ourselves that the fuel tank bunding is fit for purpose.

Improvement programme

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

IC1 which requires the operator to produce an Air Quality Management Plan (AQMP) following our template in conjunction with the Local Authority outlining measures to be taken in the event of a National Grid failure.

IC2 which requires the operator to submit a monitoring plan for approval by the Environment Agency 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).

Emission Limits

We have decided that emission limits are not required in the permit.

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 specified monitoring of emissions of carbon monoxide from emission points A1 to A21 (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 Medium Combustion Plant Directive (MCPD), which specifies the minimum requirements form monitoring of carbon monoxide emissions, regardless of the reduced operating hours of the plant.

We have also specified monitoring of emissions of NOx from emission points A1 to A21 (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 16 February 2021 (formerly known as TGN M5).

We have set an improvement condition (IC2) requesting the operator to submit a monitoring plan for approval by the Environment Agency detailing the operator's proposal for the implementation of the flue gas monitoring requirements specified in the permit. The improvement condition is applicable to all data centre permits which include new MCP, unless the application includes a monitoring proposal that already meets the requirements of table S3.1.

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 medium combustion plant is first put into operation, whichever is later.

Reporting

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 stand-by 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.

Previous performance

We have assessed operator competence. There is no known reason to consider the operator will not comply with the permit conditions.

We have checked our systems to ensure that all relevant convictions have been declared.

No relevant convictions were found. The operator satisfies the criteria in our guidance on operator competence.

Financial competence

There is no known reason to consider that the operator will not be financially able to comply with the permit conditions.

Growth duty

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.

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:

1. Recommendation that when considering appropriate permit conditions the Environment Agency takes into account that the proposed application is in an area of poor air quality, with four Air Quality Management Areas designated by the local authority, but in the vicinity of the site for nitrogen dioxide and that the reported background roadside nitrogen dioxide concentrations are in excess of the annual mean air quality standard and the non-roadside concentration is >75% of the annual air quality standard.

2. Recommendation that justification is provided for the absence of a risk assessment of other potential air emissions, for example particulate matter. The operator has only undertaken assessment on oxides of nitrogen. Where no justification is provided, it is recommended that a risk assessment is undertaken.

3. Recommendation that documentation on management of air quality impacts (AQMP) is submitted in advance of any permit granting to support the decision-making process and assessment of potential impact.

4. Recommendation that assessment of surrounding data centres on background air quality is provided and if required further mitigation undertaken, which may include but not be limited to co-ordination of testing to ensure that testing is undertaken at different times;

reduced frequency of testing; undertaking testing at times when background air quality concentrations are reduced.

5. Recommendation that assessment is provided by the operator on the emergency power outage scenario, as well as the impacts from other data centres on the background air quality and potential impacts from the proposed permit.

6. Recommendation that justification is provided as to why the operator has assessed potential impacts from a 24 hour and 72 hour blackout scenario.

7. Recommendation that assessment is provided by the operator on the proposed annual full load in-service test on each set of 7 generators.

Summary of actions taken:

With regard to appropriate permit conditions, background air quality and the assessment of surrounding data centres on background air quality during testing and the emergency operation scenario the following applies:

As described in more detail in the Air Quality Section above, we audited the operator's air quality assessment, including undertaking detailed check modelling and completing sensitivity analysis.

The facility is not located in an Air Quality Management Area (AQMA) but is located within 400m of an AQMA and so abatement in the form of selective catalytic reduction (SCR) would be implemented to achieve a NOx emission limit value (ELV) of 190 mg/m3 (at 15% O2). The operator has derived the background NO2 concentrations for human health receptors from the Defra predicted background concentrations for 2023 and from local monitoring data measured by Slough borough council. We included sensitive human receptors which were not included by the operator and are satisfied that worst-case emissions from the site will not cause an exceedance of the relevant ES at all receptors. In conclusion, based on the modelled operating envelope and the results from our audit, the site is unlikely to cause an exceedance of an environmental standard at human health receptors. However, we cannot rule out exceedances of the annual NO2 environmental standard as a result of an emergency grid failure scenario, but historical grid reliability suggests exceedances are unlikely to occur.

With regard to the absence of a risk assessment of other potential air emissions, for example particulate matter, the operator submitted an Air Quality Assessment that assessed the impacts of nitrogen dioxide (NO2) for human health, and on nitrogen oxides (NOx) and nutrient and acid nitrogen deposition for ecological impacts, as these are the principal pollutants of concern with respect to emissions from low sulphur diesel oil generators. However, the generators will be installed with Selective Catalytic Reduction (SCR) technology to control the NOx emissions to safeguard human health; thus, the assessment also considers the potential for emissions of ammonia (NH3) associated with slippage from the installation. The operator scoped out the impacts of sulphur dioxide and particulate matter stating that these emissions will be negligible due to the properties of the low sulphur diesel fuel, as evidenced by the absence of emission limit values for these pollutants from this fuel type under Schedule 25A of the EPR. Potential emissions of volatile organic compounds and carbon monoxide are excluded on the same basis. We accept the operator's approach. Based on particulate emissions data provided in the technical data sheets submitted with the application, we agree that the total operational hours and emergency running period will not be long enough to cause exceedances of the relevant Environmental Standards. We have however, included a condition in the permit restricting the fuel to ultra-low sulphur gas oil or alternative fuels as agreed in writing with the Environment Agency.

With regard to the recommendation that documentation on management of air quality impacts (AQMP) is submitted in advance of any permit granting to support the decision-making process

and assessment of potential impact, we have included improvement condition IC1 that requires the operator to produce an Air Quality Management Plan outlining response measures to be taken in the event of a grid failure. This is the standard approach for the sector.

With regard to justification as to why the operator has assessed potential impacts from a 24 hour and 72 hour blackout scenario, the operator supplied a 24 hour 'worst-case scenario' with their application. However, they were requested by us to provide a 72 hour 'worst-case scenario' as this is the Environment Agency's worst-case standard for data centres.

With regard to an air quality assessment being provided by the operator on the proposed annual full load in-service test on each set of 7 generators as proposed in the operator's 'Supporting Document' dated 13/06/2022, this testing regime has since been revised. The Air Quality Assessment dated 26/04/2023 set out the testing regime of the generators being tested for an hour each month in banks of three or four (total operation is 12 hours per generator per year). An email from the operator dated 21/06/2023 confirmed that the generators are going to be tested individually for 30 minutes every fortnight, and that the modelling was done in banks of three and four to provide a conservative assessment. We audited the testing scenarios in the operator's air quality assessment, including undertaking detailed check modelling and completing sensitivity analysis and are satisfied that the site is unlikely to cause an exceedance of an environmental standard at human health receptors during the testing scenarios.