Cyfoeth Naturiol Cymru
Natural Resources Wales

Natural Resources Wales Permitting Decisions

Vantage Data Centers UK Limited (Newport Data Centre)

Decision Document

Application for a Substantial Variation

The application number is: PAN-026558

The permit variation number is: EPR/BB3599CW/V004

The applicant / operator is: Vantage Data Centers UK Limited

The Installation is located at: Imperial Park, Celtic Way, Marshfield, Newport NP10 8BE

Purpose of this document

This decision document:

- explains how the application has been determined
- provides a record of the decision-making process
- shows how all relevant factors have been taken into account
- justifies the specific conditions in the permit other than those in our generic permit template.

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

Contents

1. Executive summary

1.1. Application summary

The operator, Vantage Data Centers (UK) Limited, holds a permit to operate a Schedule 1 Part A(1) 1.1(a) activity for the burning of any fuel in an appliance rated thermal input of 50 or more megawatts. The permit is for 202 back-up engines to provide power in the event of a power supply failure from the National Grid at Newport Data Centre (CWL11 and CWL12) in Newport, South Wales. The permit relates to only this combustion activity, not the Data Centre operation itself. The only planned operation of these engines is for planned testing/maintenance. Other than this, apart from very minimal additional testing should there be any faults or unplanned maintenance (which will be short duration) the engines will remain off, and retained for emergency use only. Emergency use is considered to be very unlikely and there are extensive measures in place (in line with Best Available Techniques for the sector) to minimise the likelihood and duration of any national grid power failure (e.g. dual HV connection direct to “super grid” each of which is capable of powering the entire site, extensive inventory of electrical spares on site, etc – as further detailed in previous permit applications).

The maximum aggregated thermal input of the engines is 520 MW, although due to permitted 75% engine loading constraints on some of the engines, the site has an actual aggregated thermal input of 415.3 MW. The engines are considered Medium Combustion Plant (MCP), having a thermal input greater than 1 MWth and less than 50 MWth, and are subject to Schedule 25A of the Environmental Permitting Regulations (EPR). The permit relates to only the combustion activity, not the data centre operation itself.

Of the 202 engines permitted, the operator has installed 123. Due to engine design developments, the operator has proposed to change the permitted specifications of the remaining engines to be installed and reduce the total number of permitted engines from 202 to 194. It is proposed that the new engines will normally run on Hydrotreated Vegetable Oil (HVO), but conventional diesel may be used as a secondary backup fuel. The new engines will be fitted with Selective Catalytic Reduction (SCR) for NOx

emissions abatement and an Ammonia Slip Catalyst (ASC) to mitigate “ammonia slip” emissions.

To allow greater flexibility in operation, the variation is also to remove the 75% engine load constraint for the engines added under the previous variation (V003) (except for one cell “cell TF5”) and the 71 new engines to be installed. This change will mean the aggregated thermal input will be 519.4 MW (an increase of 104 MW).

As per the existing permit, all engines are still proposed to operate for less than 500 hours per year and will be considered Limited Operating Hours MCPs and therefore are exempt from the emission limit values set out in Schedule 25A of EPR.

1.2. Our decision

We have decided to issue variation for Newport Data Centre operated by Vantage Data Centers UK Ltd.

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.

2. Receipt of the application

The application was received on 05/08/2024**.** In order for us to be able to consider the application duly made, we needed more information, mostly related to the air quality assessment.

A letter requesting this information was sent to the applicant on 09/10/2024. Upon receipt of this information, on 25/10/2024, we were able to consider the application duly made. This means we considered it was in the correct form and contained sufficient information for us to begin our determination, but not that it necessarily contained all the information we would need to complete that determination.

3. Confidential information

The applicant made no claim for commercial confidentiality, and we have not received information in relation to the application that appears to be confidential in relation to any party.

4. Legislation

The variation will be issued under Regulation 20 of the EPR. The Environmental Permitting regime is a legal vehicle which delivers most of the relevant legal requirements for activities falling within its scope. In particular, the regulated facility is:

- an *installation* as described by the IED;
- *plant* as described by Schedule 25A covering the Medium Combustion Plant (MCP) Directive
- subject to aspects of the Well-Being of Future Generations (Wales) Act 2015 and the Environment (Wales) Act 2016 which also have to be addressed.
- A *relevant installation* in respect of Schedule 24 of EPR: Energy Efficiency Directive (new MCP >20 MWth aggregated or individual)

We address the legal requirements directly where relevant in the body of this document. NRW is satisfied that the decision on this application is consistent with its general purpose of pursuing the sustainable management of natural resources (SMNR) in relation to Wales and applying the principles of SMNR. In particular, NRW acknowledges that it is a principle of sustainable management to take action to prevent significant damage to ecosystems. We consider that, in issuing the variation a high level of protection will be delivered for the environment and human health through the operation of the Installation in accordance with the permit conditions. NRW is satisfied that this decision is compatible with its general purpose of pursuing the sustainable management of natural resources in relation to Wales and applying the principles of sustainable management of natural resources.

As the EPR regulator for Part A1 installations in Wales, NRW are required to determine any duly made Part A1 permit applications. This means that we must decide either to grant, or to refuse the variation based upon an objective assessment of the proposals

against the detailed legal requirements of EPR. Our public participation statement[1] gives more information on what can, and cannot, be taken into account when making our permitting decision.

The application, and this decision document, only considers the permitting of the facility under EPR as described throughout the document. We only assess the installation and its impacts and cannot take into consideration indirect impacts which are not as a direct result of activity within the installation boundary.

Any proposed development and wider associated activities will be required to be compliant with all relevant and applicable law, for example, environmental law, health and safety law, planning law. This other legislation acts largely independently of EPR (although they may be inter-related). Such other matters are beyond both the scope of this document, and of our regulatory remit and expertise and are not relevant to our EPR permitting decision. Ensuring compliance with all other regulation and obtaining any required consents (such as planning permission) is the responsibility of those undertaking the development and is regulated by the relevant appropriate authority for each.

5. Consultation

5.1. Consultation the Application

We have carried out consultation on the application in accordance with the Environment Permitting Regulations (EPR), our statutory Public Participation Statement (PPS) and our Regulatory Guidance.

The application was originally submitted as a ‘normal’ variation. However, during determination, assessment of the technical detail submitted with the application indicated that the change aligned with the definition of ‘substantial change’ given in EPR. In accordance with RGN 8[2] and our Environmental Permitting Charging Scheme 2024-25[3], we reclassified the variation application as a ‘substantial’ variation.

[1] Natural Resources Wales / Public participation: how you can take part in our permit and licence consultations
[2] Substantial changes in operation at installations, mining waste facilities and other facilities involving solvent and combustion
[3] NRW’s Environmental Permitting Charging Scheme 2024-25

Substantial variations require NRW to carry out external consultation with the public and other agencies with which we hold ‘Working Together Agreements’.

A copy of the application is available on the public register for anyone to view. We advertised the application to the public by a notice placed on our website directing people to the public register, advising them of how they could arrange for copies to be made if required and how they can provide comments.

We also consulted with the following bodies, which includes those with whom we have “Working Together Agreements”:

- Public Health Wales
- Health & Safety Executive
- Newport City Council Local Authority – Planning
- Newport City Council Local Authority – Environmental Health

These are bodies whose expertise, democratic accountability and/or local knowledge make it appropriate for us to seek their views directly.

The consultation started **13/01/2025** and ended on **12/02/2025.**

A summary of consultation comments and our response to the representations we received can be found in Annex 2.

5.2. Draft Permit Consultation

We are have carried out consultation on our draft decision. This consultation will began on **14/02/2025** and ended on **14/03/2025**. No consultation responses were received.

6. Requests for information

Several informal information requests were made via email. Copies of the information e-mails requesting further information were placed on our public register as were the responses when received.

7. The Installation

7.1. The permitted activities

This section will outline the existing permitted activities.

The regulated facility is an installation which comprises the following activities listed in Part 2 of Schedule 1 and the following directly associated activities (DAA):

- Section 1.1 Combustion Activities - Part A (1) (a) Burning any fuel in an appliance with a rated thermal input of 50 or more megawatts.
- DAA – Fuel storage for the engines
- DAA – Surface water drainage (uncontaminated rainwater)

In addition, the engines are subject to Schedule 25A of the Environmental Permitting Regulations as Medium Combustion Plant (MCP) on an installation. This is reflected in the permit where the relevant MCP conditions have been implemented. We do not consider the MCP aggregation rules (Article 4 of the MCPD) to apply.

Together, these listed and directly associated activities comprise the Installation.

The existing permit specifies the number of engines and specifications as follows:

- 10 x 1.970 MWth Perkins 4006-23TAG3A
- 29 x 1.457 MWth MTU 12V1600G20F-E (X715C2)
- 18 x 1.311 MWth Volvo Penta TAD 1642GE
- 5 x 3.226 MWth Mitsubishi S12R-F1PAW2 (T1650C)
- 15 x 2.987 MWth Kohler KD45V20-5DEP
- 125 x 2.987 MWth Kohler KD45V20-5DES

The 15 x 2.987 MWth Kohler KD45V20-5DEP and the 125 x 2.987MWth Kohler KD45V20-5DES engines currently have a 75% engine loading constraint which is controlled via the permit's operating techniques. This loading constraint means the site's actual aggregated thermal input is 415.3MW, although there is a maximum capacity of 520MW if the loading constraint is disapplied.

7.2. Changes to the installation

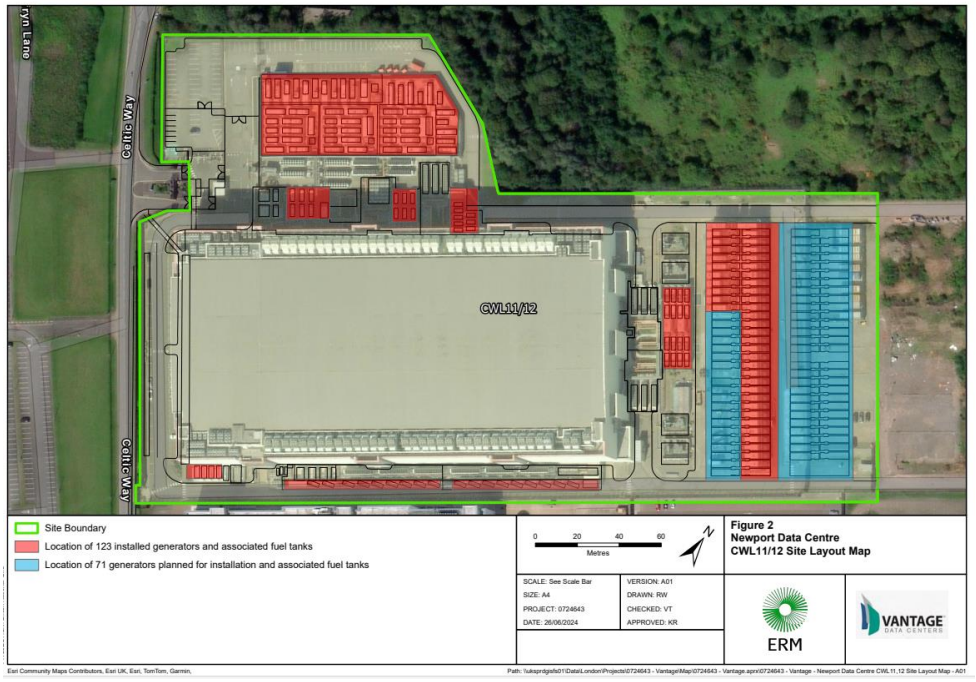
As a result of this variation the limits of the permitted activities will be changed to reflect the change in generator specifications and arrangement. Of the 125 Kohler engines

(detailed above in section 7.1), 79 have not been installed. This application is to change the uninstalled engines to:

- 18 x Kohler KD45V20-5EFS (KD1800-F)
- 53 x Kohler KD45V20-5DFS (KD1650-F)

The description of the Schedule 1 Activity will be changed to reflect this change.

The figure below (provided by the operator) shows the arrangement of the installed engines (shaded red) and the 71 new engines (shaded blue) proposed as part of this variation.



The 75% load constraint from all relevant engines apart from those in “cell TF5” (this consists of 5 x KD45V20-5DES engines) will be removed as part of this variation. This includes the 71 new engines to be installed. This change will mean the aggregated thermal input will be 519.4 MW (an increase of 104 MW).

The 71 new engines will have Selective Catalytic Reduction (SCR) which will reduce NOx emissions. The system will inject AdBlue (urea solution) into the exhaust gas steam which will be hydrolysed into ammonia and reduce NOx emissions. An

Ammonia Slip Catalyst (ASC) will be used to eliminate any ammonia gas from being emitted from the engines' stacks.

The new engines and associated fuel tanks are located above-ground. The fuel and AdBlue storage tanks will be located within the generator containers which can contain 110% of the tanks' capacities. All tanks have bunded fill point cabinets and leak detection systems. The engine containers will be located on hardstanding.

The new engines that will be permitted as part this variation (V004) are classed as *new* medium combustion plant as they will be put into operation after 20 December 2018. 'Put into operation' means the plant being fired up to its full load with its design fuel.

The variation will also update the 'Fuel Storage' DAA to include the storage of HVO. A new DAA will be added for 'Chemical Storage'. This will cover the storage of AdBlue needed for the SCR.

8. Operation of the installation

8.1. Operator competence

The operator will continue to be the sole operator of the Installation following this variation. We are satisfied that the operator is the person who will have control over the operation of the Installation after the permit the variation is issued, and that they will be able to operate the Installation so as to comply with the conditions included in the permit. The decision was taken in accordance with EPR RGN 1 Understanding the meaning of operator[4].

Relevant Convictions

The operator has declared they have no relevant convictions. NRW's COLINS Database has been checked to confirm there are no relevant convictions. No relevant convictions were found.

[4] RGN 1 Understanding the meaning of 'operator' (naturalresources.wales)

Financial Provision

The operator has declared they have no current or past bankruptcy or insolvency proceeding against them. There is no known reason to consider that the operator will not be financially able to comply with the permit once the variation is issued. The decision was taken in accordance with RGN 5 on Operator Competence[5].

8.2. Environmental Management System

The operator has stated in the application that they will implement an Environmental Management System (EMS) that will meet the requirements for an EMS in our "How to comply with your environmental permit" guidance[6]. The operator has confirmed in the application that their EMS is certified to ISO 14001:2015 and will be reviewed and updated to include changes as a result of this variation. A summary of the EMS has been submitted with the application.

We have reviewed the application and are satisfied that appropriate management systems and management structures will be in place for this Installation, and that sufficient resources are available to the operator to ensure compliance with all the Permit conditions.

Accident management

We have reviewed the operator's proposed risk management techniques that will be imposed in the event of various accidents and incidents which may occur as a result of the variation. We are satisfied that appropriate controls will be in place to help reduce the occurrence and impact of any accidents that occur.

In order to ensure that the management system proposed by the applicant sufficiently manages the residual risk of accidents, permit condition 1.1.1a requires the implementation of a written management system which addresses the pollution risks associated with, amongst other things, accidents.

There is a specific type of Accident Management Plan for air quality impacts which is discussed in section 11.

[5] RGN 5 Operator Competence (naturalresources.wales)
[6] Natural Resources Wales / Guidance to help you comply with your environmental permit

Efficient use of raw materials, water and energy

HVO is being added to the permit as a new raw material as a result of this variation application. This is because the new engines being included in the permit will be fuelled with HVO. AdBlue will also be added as this material is required for the SCR abatement system.

Having considered the information submitted in the application, we are satisfied that the applicant will ensure that raw materials, water and energy are used as efficiently as possible.

The operator will be required to ensure raw materials are used efficiently under condition 1.3 of the permit. They will also need to report generator operation for maintenance and testing and emergency scenarios. This will enable us to monitor energy recovery efficiency at the installation (along with ensuring air quality impacts are minimised).

Avoidance, recovery or disposal of wastes produced by the activities

Expired AdBlue will be removed from the site by a licensed contractor. There are no other changes to the waste types and volumes generated by the installation as a result of the variation.

We are satisfied that waste from the Installation that cannot be recovered will be disposed of offsite using a method that minimises any impact on the environment. Permit condition 1.4.1 of the permit will ensure that this position is maintained.

9. Best Available Techniques (BAT) and Regulatory Guidance

Article 14(3) of IED states that BAT conclusions (BATc) should be the reference for setting permit conditions. However, there are no published BATc which are directly relevant to this proposal. Although the total thermal capacity of the installation is 520 MWth, neither Chapter III of IED (for large combustion plants) nor the large combustion plant BATc are directly applicable as the individual combustion plant (engines) are each less than 15 MWth and exhaust gases from them are discharged through separate stacks which could not reasonably be combined, and thus aggregation is not

applicable. In this situation Article 14(6) of IED applies, making the regulator responsible for determining BAT in consultation with the operator.

In line with previous applications for this activity, we have defined BAT in this case as:

- As each individual plant is subject to the MCPD, the requirements of the Directive (Schedule 25A of EPR) for each individual engine may be considered minimum standard BAT for the collective combustion plant, noting that exemptions apply for plant operating for a limited number of hours.
- As the most relevant BAT conclusions, we may refer to the LCP BATc "for information" only if applicable.
- The above is supplemented but not replaced by BAT definitions in our adopted regulatory guidance:
    - Natural Resources Wales "BAT for [installation] combustion plant outside of the scope of the LCP BREF – Interim Position", 30/04 2019
    - Environment agency guide "Data Centre FAQ Headline Approach; Draft Version 8.0 (17/07/17)" – adopted by NRW in the above position document.
    - It is noted that subsequently, the EA have released further versions of this document, up to Version 21 (15/11/2022)[7] – to which we will also refer.
    - GOV.UK guidance, "Emergency backup diesel engines on installations: best available techniques (BAT)"[8]
    - As backup engines on an IED Chapter II installation. The plant is excluded from the specified generator regulations, but these may provide indicative BAT, for example the maximum annual duration of testing operations.

We have also had regard to Article 18 of IED which may require measures "beyond BAT" to be taken if required in order to achieve compliance of air quality standards.

[7] Data Centre FAQ Headline Approach, version 21.0 (15/11/2022)

[8] Emergency backup diesel engines on installations: best available techniques (BAT) - GOV.UK

We have reviewed the changes to the installation proposed by the operator and have compared these with BAT as defined above, mainly referring to the Environment Agency “Data Centre FAQ Guidance”, which has been adopted by NRW.

We have reviewed the techniques proposed and consider them to represent BAT at this installation. We have specified that the applicant must operate the permit in accordance with descriptions in the application. See section 13 of this document for more information on how we have incorporated the variation into the permit.

Key parts of the assessment have been detailed below.

Engine Selection

It is accepted that BAT for data centre emergency power generation is the use of engines. Engine selection is a key BAT consideration as it defines the fundamental performance standards that we expect to see demonstrated by the operator. As discussed, 79 of the 125 Kohler KD45V20-5DES engines originally permitted have not yet been installed. The operator has applied to reduce the number of engines left to be installed to 71 (taking total number of engines on site from 202 to 194) and change the specification of the remaining engines. This will mean that the 125 x Kohler KD45V20-5DES engines currently permitted will be replaced with:

- 5 x Kohler KD45V20-5DES (already installed with 75% loading constraint)
- 41 x Kohler KD45V20-5DES (already installed – with an unrestricted (i.e., 100%) loading capacity, as opposed to a 75% loading constraint)
- 18 x Kohler KD45V20-5EFS (KD1800-F) (to be installed, 100% engine loading, SCR)
- 53 x Kohler KD45V20-5DFS (KD1650-F) (to be installed, 100% engine loading, SCR)

BAT for emergency backup diesel engines on data centres is primarily based on engine selection and management techniques, both of which are used to minimise NO_X emissions. Relevant guidance states that engines should be optimised to reduce emissions (termed “emissions optimised” engines). The accepted standard for emissions optimised engines is represented by the international build standards “2g

TA-Luft" or the United States Environmental Protection Agency (US EPA) Tier 2. This equates to approximately 750mg/m^3 NO_x (as NO_2) at reference conditions 15% O_2, standard temperature and pressure, dry, 273K and 101.3kPa (equivalent to 2,000mg/m^3 at 5% O_2 – commonly termed '2g') at a typical emergency load (usually greater than 67% of standby power rating).

Of the 125 Kohler KD45V20-5DES engines added to the permit during the previous variation, the operator is proposing to keep 46, but remove the 75% engine loading constraint from all but one cell ("TF5"). This engine loading constraint was applied for by the applicant in the previous variation as a way ensuring that the engines meet the equivalent of the TA-Luft standards for NO_X. Therefore, careful consideration was given to determining whether removing the loading constraint would still ensure that the engines meet the criteria for BAT. Information in the application indicated that at a 100% load, these engines would emit 3,883mg/m^3 NOx at 5% O_2, standard temperature and pressure, dry, 273K and 101.3kPa, which is greater than the TA-Luft standard of 2,000 mg/m3 (at 5% O_2). However, our interpretation of the guidance is that as the engines have already been shown to meet the TA-Luft at 75% loading (which is referenced in the Data Centre FAQ guidance as "the 'best match' quoted load rating as the default for singe point for comparison"), they are still considered compliant at 100% loading. It is also considered that in practice it is unlikely the engines will be running at a 100% load for a significant amount of time. Considering this, and the modelled air quality impact of the change (see section 11.1.), we consider the engine selection to still represent BAT.

The 71 new engines, 18 x Kohler KD45V20-5EFS (KD1800-F) and 53 x Kohler KD45V20-5DFS (KD1650-F), will have NOx emissions which exceed the TA-Luft standard at 5,589 mg/m^3 and 3,883mg/m^3 (at 5% O_2) respectively. As discussed the TA-Luft standard (or the US EPA) is quoted in guidance to represent BAT for engine standards. However, these engines will be fitted with Selective Catalytic Reduction (SCR) which will reduce the NOx emissions to 500 mg/m3 (at 5% O_2) (equivalent to 190mg/m^3 at 15% O_2). This is in line with the Data Centre FAQ documents which acknowledge that emissions optimised engines should be TA-Luft or US EPA standard *or equivalent.* One reason for this it so ensure the widest choice of engine is available to operators. Equivalence is defined as a NOx emission profile that is less than, or

around, 2000mg/m^3 (at 5% O2). This includes 'non-BAT' engines that have been fitted with SCR to reduce emissions of NOx which are as good as, or lower, than the TA-Luft (or US EPA) standards, as is the case here. BAT for engines using SCR is detailed in the Data Centre FAQ document and is defined as emissions which are equivalent to the MCPD Emission Limit Value (ELV) compliance at 190 mg/m^3 (at 15% O_2, equivalent to 500 mg/m^3 at 5% O_2) which as described above, these new SCR fitted engines are capable of achieving.

The proposed changes represents an overall improvement in NOx emissions from the engines as demonstrated in the table below, a comparison of engines being swapped out as part of the variation:

Existing permit				
Engine type	Kohler KD45V20-5DES			
No. of engines	125			
Engine load	75%			
SCR	No			
NOx emissions rate (mg/m^3) (at 15% O_2)	1,929			
Proposed variation				
Engine type	Kohler KD45V20-5DES	Kohler KD45V20-5DES	Kohler KD1800-F	Kohler KD1650-E
No. of engines	5	41	18	53
Engine load	75%	100%	100%	100%
SCR	No	No	Yes	Yes
NOx emissions rate (mg/m^3) (at 15% O_2)	1,929	3,883	500	500

Considering the relevant guidance and the air quality modelling impacts (see section 11.1) we consider the new engines to represent BAT and to be a significant improvement on the originally proposed engines.

An improvement condition will be included in the varied permit requiring the operator to verify that the new engine emissions do not exceed those outlined in the application (see Annex 1).

Plant Design, Monitoring and Maintenance

For all combustion plant, plant design features and planned preventative maintenance are important primary measures to maintain optimum performance and minimised emissions in line with manufacturer's performance specification for the units. Plant design is determined by engine selection which has been discussed above.

The operator has confirmed monitoring of emissions will be compliant with requirements of the MCPD. The SCR system uses an Electronic AdBlue dosing and monitoring package with NOx, temperature and back pressure sensors, airless injectors, and an electronic control unit for NOx control and measurement.

Emergency use of the engines is considered unlikely due to the operator implementing BAT for primary grid connection. The permit will retain the maximum 500 hour limit per MCP per year. The limit on testing for 50 hours per MCP per year for testing will also remain. There are no proposed changes to the planned testing regime, which will remain the same as that outlined in the original permit application and which has already been assessed and deemed sufficient.

Fuel selection

Hydrotreated Vegetable Oil (HVO) is proposed as the engines' primary fuel, although it is noted low sulphur diesel may be needed as a back-up fuel. Although HVO is not formally considered to represent BAT for fuel selection (due to issues with supply reliability), we consider it preferable to diesel as it is a low carbon fuel and is associated with lower NOx, carbon monoxide and particulate emissions.

Noise Emission control

The new engines will be located in sound attenuating enclosures. The applicant has demonstrated that the new engines will result in lower overall noise emissions than the engines they are replacing. See section 11.6 for more information.

10. The site

10.1. Site Plan

There are no changes to the installation boundary proposed as part of this variation. However, as the emission points to air have changed the operator has provided an updated site plan showing the extent of the facility and emission points. We consider this plan to be sufficient and it will be added to the permit (in Schedule 7) as part of the variation.

10.2. Site Condition Report

The proposal does not include the addition of any land and so a Site Condition Report was not required to support this application.

10.3. Site protection: potentially polluting substances and prevention measures

The operator has a duty to ensure that soil and groundwater are protected in order to meet the requirements of Articles 14 (1)(b), 14(1)(e) and 16(2) of the IED.

Potentially polluting substances associated with this variation include fuel (HVO or diesel) and AdBlue. The operator has included detailed pollution prevention management strategies in their application. These strategies include (but are not limited to) procedures for managing deliveries of these substances, storage tanks being located within the generator containers which provide secondary containment which is 110% of the maximum storage tank capacity, leak detection systems and level gauges to ensure tanks are not able to be filled above a safe working capacity.

Based upon the information in the application we are satisfied appropriate measures will be in place to protect the site and its surroundings from polluting substances.

11. Environmental Risk Assessment

Regulated activities can present different types of risk to the environment, these include odour, noise and vibration; accidents, fugitive emissions to air and water; as well as point source releases to air, water, sewer and discharges to ground or groundwater, global warming potential and generation of waste. All these factors have been considered during our determination and the relevant risks from this proposal are discussed in this and other sections of this document.

The next sections of this document explain how we have approached the critical issue of assessing the likely impact of emissions from the Installation on human health and the environment and what measures we are require to ensure a high level of protection.

In line with our guidance, the applicant has provided an environmental risk assessment with the application which identifies the sources of key risks from the variation, as well as possible pathways and receptors. This risk assessment and further assessments provided by the applicant and/or completed by NRW will be discussed in further detail below.

11.1. Assessment of impact on air quality

This section of the decision document looks at the air dispersion modelling included in the Air Quality Impact Assessment submitted with the application and impacts on local air quality and human health. Impacts on air quality at protected sites are discussed separately in section 12 but have been considered on the basis of the same underlying dispersion modelling.

The applicant has assessed the Installation's potential emissions to air against the relevant air quality standards, and the potential impact upon human health in line with relevant guidance[9,10]. The modelling has predicted the process contribution (PC) at human and ecological receptors that could be impacted by the emissions from the varied permitted activity.

The PC is the estimated concentration of an emitted substance, and when calculated within a dispersion model, takes into account relevant parameters of the release and surrounding conditions, including local meteorology.

Once short-term and long-term PCs have been calculated, they are compared with Environmental Standards (ES). PCs are considered insignificant if:

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

[9] Air emissions risk assessment for your environmental permit - GOV.UK (www.gov.uk)
[10] Acute Exposure Guideline Levels for Airborne Chemicals | US EPA

- The short-term PC is less than 10% of the relevant ES.

When an emission is screened out as insignificant, we would normally consider that the applicant's proposals for prevention and control of the emission are acceptable. Where an emission cannot be screened out as insignificant, it does not mean it will necessarily be significant. In these cases, we determine whether exceedances of the relevant ES are likely. This is done through detailed audit and review of the applicant's dispersion modelling, taking background concentrations and modelling uncertainties into account. Assessment considers the predicted environmental concentration (PEC), which is the PC of the substance, plus the background concentration of the substance already present in the environment. PECs are normally considered to be not significant where:

- Proposed emissions comply with ES or the equivalent requirements where there is no ES; and
- The resulting PECs do not exceed 100% of the ES.

The assessment has predicted the potential effects on local air quality from the Installation's stack emissions using the AERMOD Lakes dispersion model which is a widely accepted computer model used in regulatory dispersion modelling. The model used 5 years of meteorological data collected from the meteorological station at Cardiff Airport between 2017 and 2021. The impact of the nearby buildings surrounding the site upon plume dispersion was considered in the modelling. It is intended the 'new' engines will run on HVO but assessment has been based on using diesel (i.e. the backup fuel) as a worst case scenario.

We have not required the operator to complete detailed assessment of SO_2 as the operator is proposing to use HVO or ultra-low sulphur diesel which both have inherently very low, or negligible, sulphur contents. To demonstrate the very low sulphur emissions, the applicant has used the anticipated fuel consumption from the worst preforming engine in terms of NOx emissions to calculate a maximum 1 hour SO_2 PC of 0.0566 µg/m^3 for a single engine or 0.0763 µg/m^3 for a cell. They have considered the applicable ES for SO_2 of 350 µg/m^3 (hourly mean) and stated the calculated PC values are significantly lower than this. We have calculated that in both

cases PC is below 10% (0.028% and 0.082% for single engine and cell respectively) and so agree emissions can be considered insignificant.

CO has not been subject to assessment and we are in agreement with this approach in this instance. Long term (annual) PM_{10} and $PM_{2.5}$ have not been assessed in line with the expectation that the engines will not be operating on a long term basis (the maximum duration of any of the modelled scenarios is only 72 hours). A screening exercise was completed for short term (daily) PM_{10} which concluded emissions would not be significant and therefore they are not discussed further in this document.

A side-effect of use of SCR with urea can be “ammonia slip” – the release of low levels of ammonia in exhaust gases. Ammonia is a pollutant which can affect human health and particularly ecological receptors. However, the operator proposes ammonia control through an Ammonia Slip Catalyst (ASC) following the SCR reactor to destroy any residual ammonia remaining. The use of ASC is a further control not always seen as standard with SCR and represents further emissions control. As a result of this further abatement, emissions of ammonia have been screened out of detailed assessment. Evidence of the capability of the ASC has been provided in the form of a letter from the supplier confirming there will be no ammonia-slip. We are in agreement with this approach in this instance.

The principle pollutant of concern which was subject to detailed modelling was Oxides of Nitrogen (NOx), expressed and NOx and NO_2, with both nitrogen deposition and acid deposition assessed.

The air impact assessments, and the dispersion modelling has been based on the following emission rates:

- 77 permitted engines at CWL11 (permit emission point (EP) A1-77) based on pollutant emission rates specified by the engine manufacturer (as per previous modelling completed for previous applications)
- “cell TF5” (EP A78 – A82) based on updated pollutant emission rates specified by engine manufacturer

- The remaining 41 engines at CWL11 (EP A83-A93 and A113-A142) operating with a 100% load as opposed to 75% load constraint previously modelled for previous applications
- “new” engines fitted with SCR (EP A94 – A111, A143 – A195) are assumed to meet the MCPD Emission Limit Values (ELV). However it is expected that NOx will not be fully abated during startup of the engines. This has been accounted for in the model using supplier data.

The detailed modelling assessed the following scenarios

- Individual cell testing (quarterly, 2 x 15 minute and 2 x 2 hour per engine per year)
- Cell testing (“black building tests”, bi-annual cell testing, 2 x 15 minute per engine per year)
- Unplanned emergency operation – 1 hours
- Unplanned emergency operation – 72 hours

For previous applications, the applicant has only modelled a 1 hour unplanned emergency operation. However, the inclusion of a 72 hour outage scenario is appropriate as the most recent version of the Data Centre FAQ document[5] and more recently, .GOV guidance on detailed modelling[7], now recommend that this scenario is considered in dispersion modelling assessments.

Impacts of the proposed new engine arrangement have been modelled at 45 discrete sensitive human receptors, and assessment of significance of the results have been presented from the highest modelled impacted receptor.

The short-term Environmental Standard (ES) for NO_2 is an hourly limit value of 200 µg/m^3, which can be exceeded a maximum of 18 times per year.. The long-term (annual) limit value is 40 µg/m^3.

The short-term ES for Nitrogen Monoxide (NO) is an hourly limit value of 4,400 µg/m^3, which can be exceeded a maximum of 18 times per year. The long-term limit value is 310 µg/m^3 .

In accordance with our adopted guidance for Data Centres, the applicant has also assessed impacts against the Acute Exposure Guidance Levels (AEGL)[11] as defined by the US EPA and which are applicable to "*rare exposure to airborne chemicals*".

Three levels of AEGL are defined for any substance assessed under the scheme. AEGL-1 is the lowest level, where notable discomfort or irritation may occur, but effects are non-disabling, transient and reversible upon exposure ending. AEGL-2 is a level at which irreversible or serious long-lasting health effects may occur, and AEGL-3 is a level at which life-threatening health effects or death may occur.

The focus in this assessment is mainly on AEGL-1, with AEGL-3 not being relevant. AEGLs are defined for short-term exposures of 10 minutes, 30 minutes, 60 minutes, 4 hours and 8 hours. For NO_2 the AEGL-1 is the same (940 µg/m^3) for all exposure periods of 10 minutes to 8 hours and the AEGL-2 varies with exposure period, from a minimum of 12,600 µg/m^3 for an 8 hour exposure, to a maximum of 38,000 µg/m^3 for 10-minute exposure. The AEGL-1 is directly comparable with the UK Health and Safety Executive 8-hour workplace exposure limit.

Planned testing

For testing scenarios, the applicant has modelled short term emissions from the site (CWL11 and CWL12) in combination with the adjacent data centre, CWL13. This permit (permit number EPR/CB2895HY) is for another data centre installation (which consists of 60 emergency engines) held by the same operator but is a separate installation. The in-combination modelling is a precautionary approach accounting for any testing overlap. We are in agreement with this approach.

The results presented below represent the maximum PC at any of the modelled receptors for the relevant pollutant species. This represents worst-case scenario as be definition, all other receptors have modelled PCs that are lower than the maximum.

Individual Engine Testing (Quarterly)

[11] United States Environmental Protected Agency: Acute Exposure Guideline Levels for Airbourne Chemicals

For this scenario, modelling results predicted:

- **Short term NO_2:** the maximum PC (172 µg/m^3) was more than 10% of the short term ES (86%) and therefore could not be screened out as insignificant. However, concentrations inclusive of background (PEC) (196 µg/m^3) are less than 100% of the ES (98%) and so can be considered not significant.

- **Short term NO:** the maximum PC (552 µg/m^3) was more than 10% of the short term ES (13%) and therefore could not be screened out as insignificant. However, concentrations inclusive of background (PEC) (557 µg/m^3) are less than 100% of the ES (13%) and so can be considered not significant.

- **Long term NO_2 / NO:** Long term impacts of individual tests alone have not been assessed. Long term impacts for all tests (individual and black building) have been assessed and are discussed below.

- **AEGL-1:** PCs were below the relevant AEGL-1 for all exposure periods considered (10-minute, 30-minute, 4-hour and 8-hour)

<u>Black Building Testing (bi-annual)</u>

- **Short term NO_2:** the maximum PC (232 µg/m^3) was more than 10% of the short term ES (116%) and therefore could not be screened out as insignificant. Concentrations inclusive of background (PEC) (256 µg/m^3) are also more than 100% of the ES (128%), indicating the risk of a breach of the ES. However, a breach is defined as there being more than 18 one hour exceedances within a year. In this case the applicant has demonstrated that based on the defined testing regime there should, at worst, only be 12 exceedances annually and so a breach of the ES is not anticipated

- **Long term NO_2 (includes both the individual and black box (cell) tests):** the maximum PC (0.019 µg/m^3) screened out as insignificant being less than 1% of the long term ES (0.05%).

- **Short term NO:** the maximum PC (643 µg/m^3) was more than 10% of the short term ES (15%) and therefore could not be screened out as insignificant. However, concentrations inclusive of background (PEC) (648 µg/m^3) are less than 100% of the ES (15%) and so can be considered not significant.

- **Long term NO_2 (includes both the individual and black box tests):** the maximum PC (0.00554 µg/m^3) screened out as insignificant being less than 1% of the long term ES (0.0018%).

    - **AEGL-1:** PEC was above the relevant AEGL-1 for 10-minute exposure period. The report details that this is the case for thirteen modelled test cell groups, with a maximum PEC of 1612 µg/m^3. No exceedances of the AEGLs thresholds for 30-minute, 4-hour, and 8-hour NO_2 are expected.

Emergency scenarios

For emergency scenarios the applicant has provided results for CWL11, CWL12 and CWL11, 12 and 13 in-combination. For the purpose of this discussion, results from the in-combination scenario will be discussed as a worst case scenario.

The results presented below represent the maximum PC at any of the modelled receptors for the relevant pollutant species. This represents worst-case scenario as be definition, all other receptors have modelled PCs that are lower than the maximum.

<u>1 hour outage</u>

- **Short term NO_2:** maximum PC (11,089 µg/m^3) was predicted to be significantly more than 10% (5544 %) of the long term ES and so impacts could not be screened out as insignificant. Consideration of PEC (11,113 µg/m^3) indicated a substantial breach of the ES (5,556 %).

- **Long term NO_2:** maximum PC (0.148µg/m^3) screened out as insignificant being less than 1% of the long term ES (0.37%).

- **Short term NO:** maximum PC (22,197 µg/m^3) was predicted to be significantly more than 10% (504 %) of the long term ES and so impacts could not be screened out as insignificant. Consideration of PEC (22,202 µg/m^3) indicated a substantial breach of the ES (505 %).

- **Long term NO:** maximum PC (0.0414µg/m^3) screened out as insignificant being less than 1% of the long term ES (0.013%).

- **AEGL-1:** the PEC was above the relevant AEGL-1 for 10-minute (20,813 µg/m^3), 30-minute (13, 663µg/m^3), 1-hour (11,089µg/m^3) and 4-hour (1,441 µg/m^3) exposure period. No exceedances of the AEGLs threshold 8-hour NO_2 was predicted.

  For reasons already discussed above for short term NO_2 impacts, we do not consider a breach of this nature likely and consider there are sufficient controls in the permit to protect human health in the event of outage.

<u>72 hour outage</u>

- **Short term NO_2:** the maximum PC (11,089 µg/m^3) was predicted to be significantly more than 10% (5544 %) of the long term ES and so impacts could not be screened out as insignificant. Consideration of PEC (11,113 µg/m^3) indicated a substantial breach of the ES (5,556 %).

- **Long term NO_2:** the maximum PC (10.7 µg/m^3) was more than 1% of the short term ES (27%) and therefore could not be screened out as insignificant. However, concentrations inclusive of background (PEC) (22.6 µg/m^3) are less than 100% of the ES (56%) and so can be considered not significant.

- **Short term NO:** maximum PC (22,197 µg/m^3) was predicted to be significantly more than 10% (504 %) of the long term ES and so impacts could not be screened out as insignificant. Consideration of PEC (22,202 µg/m^3) indicated a substantial breach of the ES (505 %).

For reasons already discussed above, we do not consider a breach of this nature likely and consider there are sufficient controls in the permit to protect human health in the event of outage.

- **Long term NO:** maximum PC (2.98 µg/m^3) screened out as insignificant being less than 1% of the long term ES (0.013%).

- **AEGL-1:** PEC was above the relevant AEGL-1 for 10-minute (20,813 µg/m^3), 30-minute (13,663 µg/m^3), 1-hour (11,089µg/m^3) , 4-hour (5,764 µg/m^3) and the 8-hour (3,769 µg/m^3) exposure period.

Discussion of results and conclusions

Natural Resources Wales modelling specialists have audited the dispersion modelling and Air Quality Impact Assessment, carrying out check modelling and sensitivity analysis. We are in agreement of the modelling approach, the way the applicant has used dispersion models, its selection of input data, use of background data. The assumptions underpinning the model have been checked and are reasonably precautionary. Even though some of the check modelling results were shown to be slightly higher than the applicants, we are in agreement with the conclusions of the assessment and have used them to inform our human health assessment.

The impact on air quality from the proposed testing and maintenance regime is the primary concern as this aspect of the operation is guaranteed to occur. The results show that for all engine testing, predicted impacts can either be screened out as insignificant or considered not significant when assessed against the relevant ES.

No exceedances of the AEGLs thresholds were shown for the individual engine tests although PEC was above the relevant AEGL-1 for a 10-minute exposure period for the bi-annual cell (“black building”) testing. Whilst this indicates a potential human health impact as a result of the testing, we agree with the applicant that results represent a worst-case scenario of the meteorological conditions within the full 5 years of meteorological data used in the modelling and that for the predicted exceedance of the AEGL threshold to occur these worst-case conditions would need to coincide with

a generator testing event. This is considered highly unlikely and the applicant has committed to undertaking ambient monitoring during back building testing to verify the AEGL-1 threshold is not exceeded at the site. This has been conditioned into the permit as an improvement condition (see Annex 1). The Operator will be required to carry out monitoring over a 6 month period to confirm the cell testing does not result in an exceedance of the AEGL-1 threshold. A 6 month period will allow monitoring to take place for each cell under the normal testing regime. We did not consider it appropriate to allow for additional testing to support this verification work. Should this investigation show there to be exceedances of the AEGL-1 threshold, the operator will need to suggest and implement suitable techniques to improve performance.

Long term impacts of emergency operation, for both 1-hour and 72-hour emergency operation, can either be screened out as insignificant or considered not significant when assessed against the relevant ES. However, short term impact assessment indicated a risk of substantial breaches of the ES and AEGL-1 threshold exceedances for the majority of exposure periods assessed.

As previously explained in this document, the purpose of the engines is to provide back-up power in the event of a national grid outage. This is not an expected scenario and the operator has effectively demonstrated in previous applications how risk of having to operate during an outage has been minimised as far as is reasonable practicable. None of these operating techniques are changing as part of this variation. Statistical analysis provided in support of previous applications has demonstrated that, even in the event of a 24-hour outage in a single year, the hypergeometric mean indicates a less than 1% probability of exceeding the air quality objective. This is based on the allowance of up to 18 hourly exceedances per year (for NO_2). For the short term ES (hourly) to be breached, there would also need to be 19 1-hour outage events a year, which is considered highly unlikely. The 72-hour scenario modelled has a greater potential to breach the limit, but an event of that magnitude is considered extremely rare.

Furthermore, in order for the above predicted impacts to occur, the highly unlikely scenario of emergency operation will need to coincide with the prevalence of the least favourable meteorological conditions from a 5 year data set as modelled. We agree

with the applicant's conclusions that due to the conservative modelling approach, in the unexpected event that the engines are run for emergency purposes, impacts are expected to be better than modelled.

If operation of all engines on site were expected to take place for significant duration and impacts quantified above do occur, or occur to an extent where there is risk to human health, operation would be unlikely to be permitted by NRW. The existing permit includes controls to protect the human health in the event of emergency operation. These include an Air Quality Management Plan (AQMP) which requires the operator to notify NRW in the event of any emergency operation. The limits of the permitted activity specifically state that emergency generation shall cease or be reduced if there is credible information that there may be an immediate danger to human health.

Article 18 of the Industrial Emissions Directive requires that further measures are taken to control emissions if it is expected the ES would be beached. However, because the likelihood of occurrence is low, we do not consider that the ES is likely to be breached.

We do consider is necessary to impose an improvement conditions (IC) related to air quality. One will be for the operator to update their AQMP to incorporate the changes to the site and update the risk assessment as a result of the variation. This IC (IC8) does not override the requirements other ICs relating to an updated AQMP (IC5 and IC6), which were still pending completion (in accordance with agreements with Natural Resources Wales) at the time variation V004 was applied for. It is expected that any revised AQMP should take into account the requirements of all applicable Improvement Conditions. We have also asked for co-ordination and co-operation arrangements to be considered in line with ICs on the CWL13 permit. An IC will also be added compelling the Operator to undertake verification work to demonstrate that the engines fitted with SCR and ASC have emission levels which do not exceed those predicted in the air quality modelling. This is to ensure the abatement is performing as stated in the application.

11.2. Assessment of impact to surface and ground water

As detailed above in section 4.2.2, containment measures are in place for potentially polluting substances associated with engine operation. There are no changes to the existing surface water drainage / emission as part of this variation.

Based upon the information in the application we are satisfied that the appropriate measures will be in place to prevent pollution of ground and surface water.

11.3. Fugitive emissions

The applicant has identified the following potential fugitive emissions in their environmental risk assessment:

- Fugitive emissions to air from the storage of fuel
- Fugitive emissions to water from a leak or spill of potentially polluting substances.

The application details measures which will be in place for preventing and minimising fugitive emissions.

Based upon the information in the application we are satisfied that the appropriate measures will be in place to prevent or where that is not practicable to minimise fugitive emissions and to prevent pollution from fugitive emissions.

11.4. Assessment of odour impact

No significant odour emissions are anticipated as a result of this variation. Based upon the information in the application we are satisfied that the appropriate measures will be in place to prevent or where that is not practicable to minimise the effects of odour.

11.5. Noise and vibration assessment

There are sensitive receptors within the vicinity of the installation which include residential receptors.

The applicant has compared the anticipated noise levels from the existing permitted engines (Kohler KD1650E) which are to be replaced with the proposed engines (Kohler KD1800-F and Kohler KD1650-F) to demonstrate how the change of engine specification will result in lower noise emission levels. The variation will also mean a

reduced number of noise sources. Noise mitigation measures proposed as part of the previous permit application, which include acoustically enclosing the engines, are proposed as part of this variation.

No information was submitted which assessed the noise impact of removing the engine loading constraints from the existing 41 x Kohler KD45V20-5DES (EP A83-A93 and A113-A142). We have therefore imposed an improvement condition for the operator to provide evidence (or a noise impact assessment) which demonstrates this change will not have an adverse impact on noise from the site. Should an impact be identified, suitable mitigation measures will need to be proposed (see Annex 1 for more detail).

Based upon the information in the application and the permit conditions being imposed, we are satisfied that there is no increased risk of noise pollution as a result of this variation and appropriate measures will be in place to prevent noise nuisance.

12. Impact on National Site Network Sites, SSSIs and non-statutory sites

The applicant has used a 10km screening distance to identify all relevant protected conservation sites which could be at risk from the proposal. Whilst we agree with the use of a 10km screening distance to identify National Site Network sites, we consider it more appropriate to consider SSSI and non-statutory sites within 2km. This is because of the intermittent nature of the operation and emissions via low stacks with very localised maximum impact. This approach is also in line with the approach taken for previous permit applications for this site.

A full assessment of the variation application and its potential to affect the identified sites identified has been carried out as part of the permit determination process. National Site Network sites, Sites of Special Scientific Interest (SSSI) and non-statutory conservation sites will be discussed separately below.

12.1. The National Site Network

The following National Site Network sites are located within 10 km of the installation:

- Severn Estuary SAC, SPA and Ramsar (approximately 2.8 km to the South East of

the Installation)

- River Usk SAC (approximately 3.5km to the East of the Installation)

A Habitat Regulations Assessment (HRA) was completed to assess the potential to affect any of the sites identified. The assessment was completed using the air dispersion modelling results discussed in detail in section 11.

In light of the conclusions of an appropriate assessment and taking account of the advice received from NRW's protected sites advisors, it has been established that the project will not adversely affect the integrity of any National Site Network site, taking into account any conditions or restrictions as applicable, either alone or in-combination with other plans and projects (as documented in section 4 of OGN 200 Form 1, and section 5 if applicable). The full assessment is available to view on the public register, see here: OGN 200 HRA Form 1.

12.2. Sites of Special Scientific Interest (SSSI)

The following SSSIs are located within 2 km of the installation:

- Gwent Levels – St Brides (approximately 550m from the installation at closest point, lying to the South and West of the site)

As a Section 28G Authority as defined in the Countryside Rights of Way Act 2000 permitting teams within NRW have a legal duty, under Section 28I of the Wildlife and Countryside Act 1981, to consult with NRW for formal advice when permitting an activity which will likely damage the features of a SSSI.

To determine if consultation is required, a SSSI Assessment was completed. The assessment was completed using the air dispersion modelling results discussed in detail in section 11. The assessment concluded that the proposed permission is not likely to damage any of the flora, fauna or geological or physiological features which are of special interest.

A copy of the assessment is available to view on the public register, please see here: SSSI Assessment.

12.3. Non-statutory conservation sites

The following relevant non-statutory sites re located within 2 km of the installation:

- Celtic Springs SINC
- LG Duffryn Site 2 SINC
- LG Duffryn Site 1 SINC
- Duffryn Pond SINC
- Afon Ebbw River (3 sub-sections) SINC
- Coed Ffynon-Oer SINC
- Cwm Pensidan SINC
- Gaer Fort SINC
- Court wood SINC
- Various Ancient Woodland (24 discrete areas)

The only impact pathway to these sites as a result of this variation is changes to emissions to air which includes NOx. The applicant has provided dispersion modelling to assess the impact of changing NOx emissions as a result of the variation on non-statutory sites.

Predicted emissions have been assessed against a short term critical level of 200 µg/m^3 and long term critical level of 30 µg/m^3. No assessment of acidification has been completed as there are no site relevant critical loads for the sites identified available. Refer to section 11 for further details of the modelling, our audit and the relevant guidance for determining significance of results.

The impact of the testing regime has on non-statutory sites has been presented. This has shown that the modelled results for the short term and long term NO_X are below 100% of the critical level for short-term and long-term concentrations and are considered not significant.

For emergency scenarios, the modelled results for the short term and long term NOx are below 100% of the critical level for short-term and long-term concentrations for the

1- hour emergency scenario. However, for the 72-hour scenario the results show that the short term NOx PCs are predicted to exceed 100% of the short term critical levels at some of the non-statutory sites, the worst impacted site being 'Celtic Spring SINC' (2726 µg/m^3 representing 1363% of the short term critical level). These results indicate the possibility of a significant breach of the short term critical level in the event of a 72-hour outage. For the long term NOx concentrations the predicted PCs are below 1% of the maximum critical level at all receptors.

As already discussed in detail in section 11, the predicted impacts in the modelling are not expected to occur due to the conservative approach of the modelling. Furthermore, the likelihood of a 72-hour outage event is considered rare. There are existing controls in the permit to protect the environment in the event the engines are used in an emergency scenario.

Based upon the information in the application we are satisfied that there will be no adverse impact to the non-statutory conservation sites identified.

13. The Permit Conditions

13.1. Incorporating the variation

We have specified that the applicant must operate the permit in accordance with descriptions in the application. These descriptions have been specified in the Operating Techniques table in the permit.

13.2. Emission limits, monitoring and reporting

There will be no changes to the permits emission, limits and reporting requirements as a result of the changes made by the variation although emission point references will be updated in accordance with the new engine arrangements.

13.3. Raw Materials and fuels

The variation will add HVO to the permit's raw materials and fuels table (Table S2.1) and specify compliance with BS EN15940 or BS EN590 or EN 2869. This is so that the HVO can be considered a direct replacement for diesel, without any further assessment, in accordance with a Position Paper (dated 20/12/2022)[12] submitted to

[12] ISG Position Paper HVO as a replacement ofr gas oil (20/12/2022) (internal link only)

and approved by NRW's Industry Sub-Group (ISG). The ISG forum is part of NRW's wider governance network and structure, which ensures that policy decisions made by the organisation are robust, transparent and defensible.

13.4. Improvement conditions

Based on the information on the application, we consider that we need to impose improvement conditions (IC8, IC9 , IC10 and IC11). Details of the improvement conditions used can be found at Annex 1. Reasons for their inclusion have been discussed where relevant in this report.

14. OPRA

The OPRA score has been reviewed and updated as part of this variation, using the most up to date version of the OPRA scoresheet and guidance. The original score was 192. The Operator proposed a new score of 112. NRW reviewed the OPRA scoresheet provided and identified that as a result of the complexity attribute being calculated incorrectly by the Operator, the new score should be 165.

This updated score has been agreed with the Operator and will form the basis for ongoing subsistence fees.

ANNEX 1: Improvement Conditions

Table S1.2 Improvement programme requirements		
Reference	Requirement	Date
IC8	The operator shall review the effectiveness and suitability of the AQMP following changes made as a result of variation V004. Updates shall include but not be limited to the following considerations: Descriptions of engine specifications and arrangements throughout the document Updated risk assessment based on the new modelled total potential impacts at individual receptors co-ordination and co-operation arrangements with co-located backup facilities operated by the same operator which may be operating at the same time Following this review, the operator should submit a revised and updated AQMP to Natural Resources Wales for approval. The improvement condition shall be considered complete only following the approval of the revised AQMP by Natural Resources Wales.	Revised AQMP to be provided to Natural Resources Wales within 3 months of permit variation V004 issue, or as otherwise agreed in writing with Natural Resources Wales

IC9	The Operator shall undertake verification work to demonstrate that engine exhaust emission levels for the engines fitted with Selective Catalytic Reduction (SCR) for NOx control and an Ammonia Slip Catalyst (ASC) (A94 – A111 and A143 – A195) do not exceed those outlined in the application air quality assessment for oxides of nitrogen (NO_X as NO_2) and for ammonia (NH_3) A detailed plan of the verification work to be carried out shall be submitted to NRW for approval. A written report of the work and its results shall be submitted to Natural Resources Wales for approval. This shall: demonstrate the performance stated in the application, that is, that there is no ammonia slip in emissions due to the use of the ammonia slip catalyst demonstrate that NO_X emissions performance stated in the application (190 mg/m^3 @ reference conditions 15% oxygen) is achieved for all operational scenarios, including short duration operation of 10-15 minutes (as an average over that operating period from cold start-up) cover performance for any fuels utilised by the engines on site (expected to be at least Hydrotreated Vegetable Oil, and may also include diesel if engines have been run on this fuel) if verified emission levels are higher than those predicted in the application, include an assessment of the most suitable techniques to improve performance to achieve those levels, an estimate of the cost and a proposed timetable for their implementation It is anticipated that the verification will include measurements of emissions from the engines once installed, in which case such measurements shall meet the MCERTs standard. If verification is possible by other means (e.g. by using manufacturers' data) then this should be justified in the verification plan referred to above.	Within 12 months of commissioning of related engines (A94 - A111 and A143 - A195), or as otherwise agreed in writing with Natural Resources Wales

IC10	The Operator shall undertake monitoring to demonstrate that during one of the planned twice yearly cell tests (“black building tests”), emissions of oxides of nitrogen (NO2) do not exceed Acute Exposure Guidance Levels (AEGL) at the relevant sensitive human receptors identified in the V004 variation permit application. A detailed plan of the monitoring to be carried out shall be submitted to NRW for approval. A written report of the work and its results shall be submitted to Natural Resources Wales for approval. This shall: monitor and assess emissions from each cell test over a 6 month period ensuring each cell is tested under the normal testing regime if AEGL-1 thresholds are shown to be exceeded, then mitigation shall be proposed, with a timetable for implementation, to bring the risk to an acceptable level where a breach of the parameters above is no longer likely.	Within 12 months of commissioning of related engines (A94 - A111 and A143 - A195), or as otherwise agreed in writing with Natural Resources Wales
IC11	The Operator shall provide evidence to demonstrate that removing the 75% engine loading constraint from the 41 x 2.987MWth Kohler KD45V20-5DES engines (A83 – 93, A113-142) will not increase noise emissions from the site. Evidence may be a BS 4142:2014+A1:2019 noise impact assessment following guidance set out in Noise and Vibration Management: Environmental Permits and Method implementation document (MID) for BS 4142, to demonstrate that noise impact has not increased. If any evidence or impact assessment demonstrates an increased noise impact as a result of removing the 75% engine loading constraint, the Operator shall propose suitable mitigation measures and a proposed timetable for their implementation. Any evidence or reports shall be submitted to Natural Resources Wales for approval.	Within 12 months of permit variation V004 issue, or as otherwise agreed in writing with Natural Resources Wales

ANNEX 2: Consultation Responses

1. Advertising and consultation on the Application

The application has been advertised and consulted upon in accordance with Natural Resources Wales Public Participation Statement. Responses to this consultation and how we have taken consultation responses into account in reaching our draft decision is summarised in this Annex.

Consultation Responses from Statutory and Non-Statutory Bodies

Response Received from Public Health Wales	
Brief summary of issues raised:	**Summary of action taken / how this has been covered**
Concerns that modelled air quality impacts exceed environmental standards and USEPA Acute Exposure Guideline levels, particularly during emergency operations. The application should not be granted without stringent operational controls.	Section 11.1 of this document explains how we have assessed the risk of air quality impacts from planned testing and emergency operation. The permit variation will not change any of the existing permit controls in place to protect the environment and human health.
Concerns the air quality impact assessment does not account for cumulative impacts from other premises activating generators during grid failures. Recommendation that a comprehensive cumulative impact assessment is conducted, incorporating all backup power sources in the vicinity.	The air quality impact assessment does account for the emergency operation of the co-located data centre "CWL13" (permit number EPR/CB3895HY) and relevant existing background sources of NO_X as discussed in section 11.1. The risk of a regional outage resulting in numerous back-up engines being used at one time is considered an extremely rare event. This is supported by information provided by the applicant for previous applications. The use of the engines in an emergency scenario will be treated as an serious incident. Furthermore, following this variation, the permit will continue to include strict controls including limits on use of the engines should a risk of immediate danger to human health be identified from the use of the back-up engines. As discussed in section 9, the engines replacing the previously permitted engines are considered to be an

	improvement compared to those previously permitted. An improvement condition has been implemented as part of this variation, requiring the operator to consider *"co-ordination and co-operation arrangements with operator(s) of other co-located backup facilities which may be operating at the same time"* in their AQMP. At this time, for this particular application, we do not consider is necessary to request any further assessments from the applicant.
Recommendation that real-time emissions monitoring should be required, with NO_2 data available at sensitive receptors.	The operator has not applied for any changes to the permit which would initiate a change in the permits monitoring requirements. We have, as part of this variation, imposed improvement conditions which require the operator to carry out monitoring to verify the conclusions of the air quality impact assessment (see section 11.1 and Annex 1).
Concerns the air quality assessment does not consider business implications if worker health is affected or discuss potential exceedances of workplace NO_2 exposure standards at the data centre or adjacent sites. Recommendation that with the Health and Safety Executive (HSE) is consulted with regarding workplace exposure risks.	The HSE have been consulted on the application and are responsible for workplace exposure regulation.
Recommendation that the AQMP should include stringent controls to minimize public health risks.	An AQMP will continue to be required as per the permit's conditions following this variation. An improvement condition requires the operator to update the plan in line with the changes bought in by the permit variation (see Annex 1). This updated plan will need to be approved by NRW.
Emergency communication strategies should extend beyond public warnings, considering power	The existing AQMP includes provisions for the community liaison approach to be

outages that could impact communication channels	agreed with the regulator and local authority in the event of a power outage. We feel this is a reasonable approach. It is envisaged that the approach taken would be proportionate to the incident risk and would take into account any impacts on communication channels.
Non-diesel alternatives should be actively explored, including increased use of HVO or battery storage.	This variation adds HVO as a fuel type to the permit. Diesel will remain as a permitted fuel type as a back-up fuel. We consider the operators proposals to represent best available techniques for the sector as discussed in detail in section 9.
Concerns regarding potential significant noise impacts at nearby receptors. Recommendation for additional noise controls, active monitoring and investigation of compliances with remedial action taken as necessary.	Section 11.5 explains how we have assessed potential noise impacts. We do not consider it required to implement any additional noise controls as a result of changes to the permit made by this variation.
Recommendation for cumulative noise impacts from multiple back up generators in Imperial Park.	As discussed above, the risk of a regional outage resulting in numerous back-up engines being use is considered an extremely rare event. We do not consider it proportional to the scale of the changes being made as part of this variation to request an additional noise impact assessment to assess cumulative impacts.
Recommendation for operator to develop a noise management plan.	The operator has not applied for any changes to the permit which would initiate a change in the permit's noise controls.
Noted suitable containment proposed for generators and fuels but recommended a thorough assessment of ground contamination risks in any future operational plans including surrender.	Noted.

Community Councils

Response Received from Newport City Council	
Brief summary of issues raised:	**Summary of action taken / how this has been covered**
Request for a local data centre collaboration group including the operator, the council, NRW and Public Health Wales.	This response is not relevant to the permit application decision. The request was raised in the internal NRA 'Air Quality Cluster Group' on 23/01/2025 for the relevant teams to consider and discuss with Newport City Council further.