Didcot North Data Centre Campus.

AIR QUALITY
AIR EMISSIONS RISK ASSESSMENT

REVISION 05 – 27 NOVEMBER 2025

Audit sheet.

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Executive summary.

Hoare Lea have undertaken an Air Emissions Risk Assessment (AERA) of emissions to atmosphere at the proposed data centre development, located within the former Didcot Power Station (hereafter referred to as the 'Site'). The purpose of this assessment is to support the environmental permit application for the 129 back-up generators to be installed at the Site.

The proposals comprise the erection of up to 197,000 m^2 of Use Class B8 data centre development with ancillary Use Class E office space, together with associated groundworks, utilities, infrastructure, engineering and enabling works (hereafter referred to as the 'Development').

The Development comprises four separate data centres, three of which are three storey and one being one storey. The three storey data centres will utilise 38 main generators and 1 house generator. The one storey data centre is provided with 8 main generators and 1 house generator. The Development also includes a new substation with a single generator for backup power in case of outage. In addition, there will be a Central Industrial Water Building (CIWB) with 2 backup generators for power in case of outage. In total, the Development will have 129 generators for back-up power generation (the 'backup plant').

The assessment considers the potential impacts associated with nitrogen dioxide (NO_2), particulate matter (PM_{10}), sulphur dioxide (SO_2), carbon monoxide (CO), and hydrocarbons (HC) assessed as benzene on 61 human health receptors and 32 ecological sites for routine testing and maintenance scenarios, in addition to an emergency outage scenario, which is representative of a 72-hour National Grid outage. All short term impacts have been assessed at the 5% risk percentile which indicates a less than 5% risk of exceedance of relevant objective.

The assessment of human health identified that impacts associated with the operation of the backup plant were found to be insignificant in the combined testing and maintenance scenarios for all pollutants. However, potentially significant impacts on the 1-hour mean NO_2 and 1-hour mean benzene objectives were identified. The total 1-hour mean NO_2 concentrations are not predicted to lead to any exceedances of the objective. Benzene has been considered to be 100% of HC emissions, when in reality it will be much less. Based on the worst-case assumptions and the highly unlikely potential of the 72-hour outage scenario occurring, impacts associated with the operation of the backup plant in all scenarios at human health receptors can be either screened out and insignificant in line with the EA screening steps or determined to be not significant through professional judgement.

The assessment of ecological receptors identified that impacts associated with the operation of the backup plant in the combined testing and maintenance scenarios were screened to be insignificant for all relevant critical levels and critical loads at all ecological receptors. Impacts at ecological receptors in the 72-hour outage scenario were found to be potentially significant impacts for the 24-hour mean NO_x critical level at the 5% risk percentile. Due to the Site having two substations, the likelihood of a 72-hour outage is considered highly unlikely to occur and therefore the modelling is likely to be over precautionary in its assumptions. However, the very short-term nature of potentially high NOx emissions associated with the use of the backup plant would not be considered to result in significant changes to the vegetation assemblages of the designated sites, because increased nitrogen uptake would only potentially occur for a few hours at most. It is therefore concluded that effects to the designated sites of the short-term increase in N deposition as a result of NOx emissions from the backup plant would not be significant.

Overall, the backup plant is not anticipated to have significant impacts on human or ecological receptors under normal operation or emergency scenario. As such, no additional mitigation is considered to be required in regard to air quality.

1. Introduction.

Hoare Lea have undertaken an Air Emissions Risk Assessment (AERA) of emissions to atmosphere at the proposed data centre development located within the former Didcot Power Station (hereafter referred to as the 'Site'). The purposed of this assessment is to support the environmental permit application for the 129 back-up generators to be installed at the Site.

1.1 The Development.

The proposals comprise the erection of up to 197,000 m^2 of Use Class B8 data centre development with ancillary Use Class E office space, together with associated groundworks, utilities, infrastructure, engineering and enabling works (hereafter referred to as the 'Development').

The Development comprises four separate data centres, three of which are three storey and one being one storey. The three storey data centres will utilise 38 main generators and 1 house generator. The one storey data centre is provided with 8 main generators and 1 house generator. The Development also includes a new substation with a single generator for backup power in case of outage. In addition, there will be a Central Industrial Water Building (CIWB) with 2 backup generators for power in case of outage. In total, the Development will have 129 generators for back-up power generation (the 'backup plant').

1.2 Previous air quality modelling.

A hybrid planning application was submitted to the Vale of the White Horse District Council (VoWHDC) in 2022 (ref: P22/V1857/O) in which an Air Quality Assessment was undertaken. Within this assessment, a detailed dispersion model was used to assess the potential impact of the proposed generators for planning purposes. This was carried out at a stage when the generator specifications had not been finalised and was therefore based on a representative example specification.

1.3 Site context.

The Site is located within the VoWHDC administrative area at the approximate National Grid Reference (NGR): X 451330 Y 191860. The Site comprises a portion of the former Didcot A Power Station that was decommissioned in 2013 and now mostly demolished. It is bound to west by Didcot B Power Station, to the north by a national grid substation, and to the south and east by industrial & logistics parks.

The Site is not located within an Air Quality Management Area (AQMA). The closest AQMA is the Abingdon AQMA, located approximately 4.5 km to the north. The location of the Site is illustrated in Figure 1.

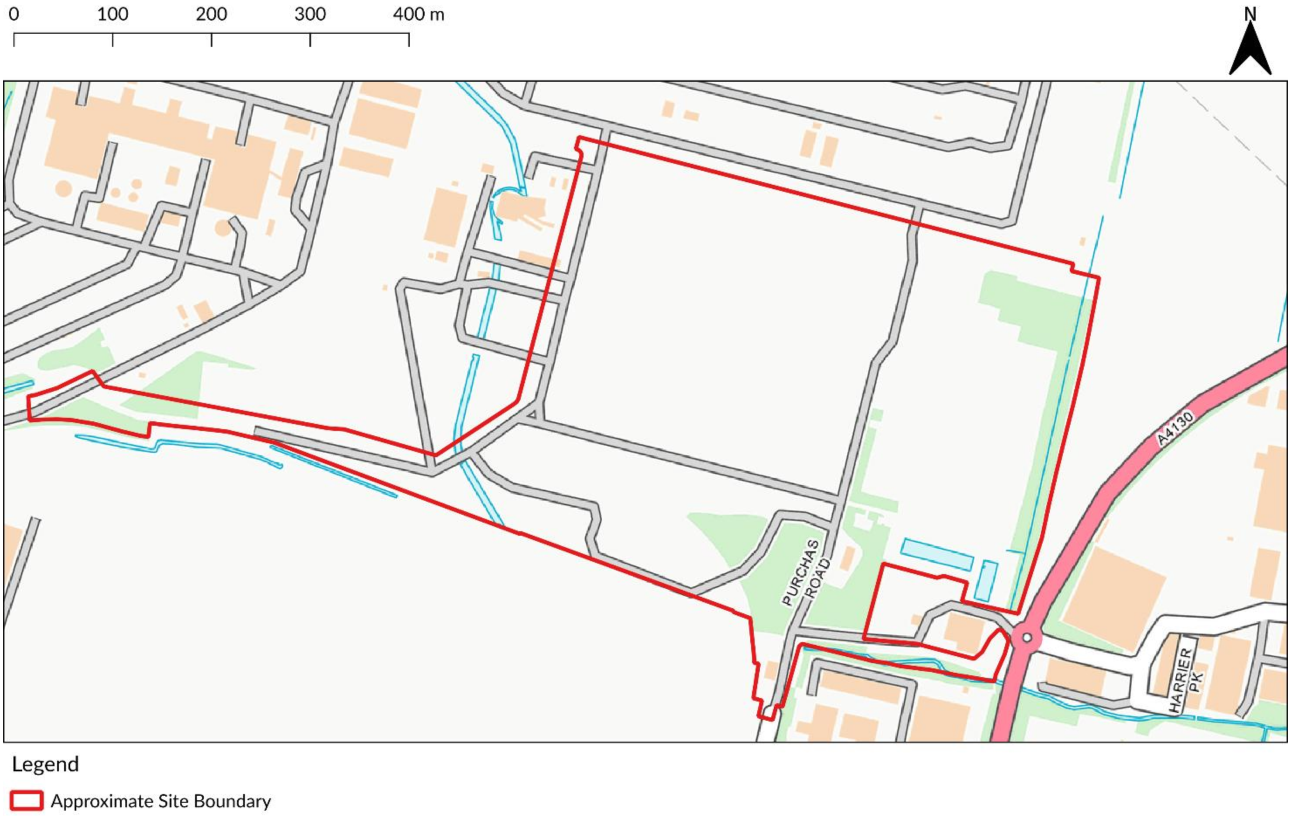

Figure 1: Location of the Site. Contains OS Data © Crown Copyright and Database rights 2024.

1.4 Scope of assessment.

The operational impacts associated with the backup plant have been reviewed using ADMS-6 dispersion model to predict the impact at ground level utilising three years of meteorological data (2022, 2023, 2024) from Benson Airfield. The potential impacts of nitrogen dioxide (NO_2), particulate matter (PM_{10} & $PM_{2.5}$), sulphur dioxide (SO_2), carbon monoxide (CO), and hydrocarbons (HC) assessed as benzene will be considered at nearby sensitive human and ecological receptors and across a gridded area for the following scenarios:

- Biweekly service testing;
- Biannual service testing;
- Maintenance testing; and
- A 72-hour emergency scenario.

This assessment has been undertaken in reference to the guidance provided by the Environment Agency (EA) in its Date Centre FAQ Headline Approach[1].

2. Legislation, policy and guidance documents.

2.1 The environment act.

The Environment Act 2021[2] acts as the UK's new framework of environmental protection and came into force on 1st April 2022. With regard to air quality, the Environment Act establishes a legally binding duty on government to bring forward at least two new air quality targets in secondary legislation. These were released for $PM_{2.5}$ in 2023 and are outlined in the Environment Improvement Plan 2023[3]. The targets are a long-term target of 10 µg/m^3 by 2040 and the interim annual mean concentration goal of 12 µg/m^3 by 31st January 2028.

2.2 Air quality standards regulations.

The Air Quality Standards Regulations 2010 (amended in 2016) defines the policy framework for 12 pollutants known to have harmful effect on human health or the natural environment. The air quality limit values for the relevant pollutants to this assessment are displayed in Table 1.

The standards for NO_2, NO, PM_{10}, $PM_{2.5}$, SO_2, CO and benzene are set out in Table 1.

The AQOs for NO_2, PM_{10} were to have been achieved by 2005 and 2004 respectively and continue to apply in all future years thereafter. It should be noted that all particulate matter has been assumed to be PM_{10}. Where AQOs are unavailable for specified pollutants, Environmental Assessment Levels (EALs), as set by the Environment Agency (EA), have been presented as detailed in the EA Risk Assessment Guidance[4] (formerly H1).

Table 1: Air quality standards for relevant pollutants.

Pollutant	Time Period	Objective
Nitrogen Dioxide (NO_2)	1-hour Mean	200 µg/m^3 Not to be exceeded more than 18 times a year
	Annual Mean	40 µg/m^3
Nitrogen monoxide (NO)	1-hour Mean*	4,400 µg/m^3
	Annual Mean*	310 µg/m^3
Particulate Matter (PM_{10})†	24-hour Mean	50 µg/m^3 Not to be exceeded more than 35 times a year
	Annual Mean	40 µg/m^3
Fine Particulate Matter ($PM_{2.5}$) †	Annual Mean	20 µg/m^3
Sulphur dioxide (SO_2)	24-hour Mean	125 µg/m^3 not to be exceeded more than 3 times a year
	1-hour Mean	350 µg/m^3 not to be exceeded more than 24 times a year
	15-minute Mean	266 µg/m^3 not to be exceeded more than 35 times a year
Carbon Monoxide (CO)	8-hour Mean	10,000 µg/m^3
	1-hour Mean*	30,000 µg/m^3
Benzene	Annual Mean	5 µg/m^3
	1-hour Mean*	195 µg/m^3

Notes:
†Measured gravimetrically.
*An EAL as set by the EA, detailed in the EA Risk Assessment Guidance (formerly H1).

The objectives apply at locations where members of the public are likely to be regularly present and exposed over the averaging period of the standard. Examples of where the annual mean objectives should apply are provided in LAQM.TG(22)[5], and include: building façades of residential properties, schools, hospitals. The annual mean objectives are not relevant for the building façades of offices or other places of work where members of the public do not have regular access, kerbsides or gardens.

The 24-hour objective is considered to apply at the same locations as the 1-hour mean objective, as well as in gardens of residential properties and at hotels.

The 1-hour objective also applies wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations, pavements of busy shopping streets, car parks and bus stations which are not fully enclosed. The 1-hour objective does not apply at kerbside sites where the public do not have regular access.

2.3 EU and UK legislation relating to combustion plant associated with data centres.

For combustion plant with a total thermal capacity of more than or equal to 1 MWth and less than 50 MWth burning any fuel, the Medium Combustion Plant regulations directive[6] apply (MCPD). The MCPD and Industrial Emissions Directive (IED) set emission limit values (ELVs) for any new combustion plant. These ELVs must be met before the plant is commissioned.

As the flues for the backup plant are not aggregated, the thermal input does not need to be combined to determine the backup plant capacity. Based on the individual sizes of the generators specified for the backup plant, the Development is classified as an MCP. However, as the generators are for backup power, with testing and maintenance equivalent to less than 50 hours per year for each generator, the ELVs do not apply. As the combined thermal input of the backup plant is anticipated to be greater than 50 MWth, Part II of the IED is also applicable.

2.3.1 Environmental permitting regulations.

The Environmental Permitting Regulations (EPR) as amended in 2016 to replace the EPR 2010, provide the main regulations for the environmental permitting regime and introduced requirements of the IED into UK legislation.

The EPR amendment 2018 SI 110 introduce the requirements of the MCPD into legislation and introduced requirements for the control of emissions from 'Specified Generators'.

2.3.2 Industrial emissions directive.

The EU's Industrial Emissions Directive[7] is the main EU instrument regulating pollutant emissions from industrial installations. The directive seeks to control the pollution to air, water, and land by listing methods to reduce harmful industrial emissions and promote the use of techniques that reduce pollutant emissions that are energy and resource efficient. The IED replaces previous guidance[8] on LCP installations. It is important to note that the ELVs outlined in the IED apply to new combustion plant operating, on average, for more than 500 hours per year and do not apply to standby generators. The limits set out above replace the LCP Directive (2001/80/EC) 500-hour operating exception.

The ELVs can be found in Annex V, Part 1 of the IED. New combustion plant operating less than 500 hours per year as a 3-year rolling average are exempt from meeting MCPD and IED ELVs.

For a datacentre that uses combustion plant solely for back-up and emergency standby, the 500-hour rule is a default ceiling limit if exhaust emission values are not set. The 500-hour rule applies to the air emissions for each individual flue. Any additional combustion plant on the site (other than those used solely for emergency use), such as boilers or heaters for regular heating supply, will be treated as non-emergency and therefore sufficient monitoring/ELVs and 'Best Available Techniques' (BAT) will apply (excluding plant below 1 MWth).

2.3.3 Medium combustion plant directive.

The MCPD limits the emissions of certain pollutants into the air from combustion plant with a thermal input of 1-50 MWth. The MCPD regulates emissions of NO_X, dust emissions (as PM_{10}) and SO_2 only, with the aim of reducing those emissions and the risk they pose to human health and the environment. There are also rules in place to monitor emissions of CO, but no ELV is in place.

For installations classed under MCPD that operate generators for emergency use and fewer than 500 hours per year as a rolling 3 year average, the ELVs set out in the MCPD do not need to be met, however an environmental permit is still required.

The 500 operating hour exemption can be extended to 1,000 operating hours per year when an emergency or standby MCP is used in the case of standby power generation when the power supply is interrupted. If an MCP qualifies for a 500-hour exemption it can run for more than 500 hours per 12 months but must not exceed 2,500 hours over five years and/or 1,500 hours over three years[9].

2.3.4 Best Available Techniques (BAT).

Any combustion plant undertaking specific types of activity are required to use BAT[10] to reduce emissions to the atmosphere. Competent authorities are to set ELVs that ensure that, under normal operating conditions, emissions do not exceed the emission levels.

Under 'General Considerations' of the BAT Conclusions, the legislation references the following in relation to air quality:

"The BAT-AELs set out in these BAT conclusions may not apply to liquid-fuel-fired and gas-fired turbines and engines for emergency use operated less than 500 h/yr, when such emergency use is not compatible with meeting the BAT-AELs."

As the Development is considered an MCP, the BAT relevant to LCP do not apply.

2.4 Habitats regulations.

The Conservation of Habitats and Species Regulations 2017, known as the 'Habitats Regulations', transposed the European Habitats Directive into UK legislation. Following the departure of the United Kingdom from the European Union (EU) in January 2020, the Habitats Regulations were updated in January 2021 following the draft publication of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. The Habitats Regulations require development to not cause a "likely to have a significant effect on a European site (either alone or in combination with other plan or projects)" or, where likely significant effects cannot be discounted, development "will not adversely affect the integrity of the site". It requires an assessment to determine if significant effects (alone or in combination) are likely, followed by an 'appropriate assessment' by the competent authority, if necessary. A competent authority is defined as a public body, statutory undertaker, minister of department of government, or anyone holding public office.

The changes to the Habitats Regulations requires the transfer of functions from the European Commission to the appropriate authorities in the UK. Due to the departure from the EU, SACs and SPAs in the UK no longer form part of the EU's Natura 2000 ecological network and instead, the updated 2019 Regulations have created a national site network where European sites are now referred to as national network sites. Many Ramsar sites overlap with SACs and SPAs and may be designated for the same or different species and habitats but do not form part of the national sites network. Despite this, all Ramsar sites remain protected in the same way as SACs and SPAs.

The Countryside and Rights of Way (CRoW) Act 2000 and the Wildlife and Countryside Act 1981 provides protection to Sites of Special Scientific Interest (SSSIs) to ensure that development does not cause damage to habitats within these sites. Locally important sites such as National Nature Reserves (NNR), Local Nature Reserves (LNR), Local Wildlife Sites (LWS) and Ancient Woodlands (AW) are also protected by legislation to ensure that development does not lead to a significant increase in pollution at these sites.

2.4.1 Critical levels.

Critical levels are thresholds for pollutant concentrations for vegetation and outline the concentrations below which harmful effects are unlikely to occur. The 2008 Air Quality Directive set limit values for the protection of vegetation and ecosystems, and these have been adopted by the Air Quality Strategy but are not currently set in regulations. These are presented in section 4.3.2.1.

2.4.2 NO_X 24-hour mean

There are two critical levels for NO_X based on the annual mean and 24-hour mean concentrations. For the 24-hour mean critical level, there is a higher criteria for environments where there are high concentrations of SO_2 and ozone, which is not generally considered the current situation in the UK according to the IAQM[11].

As such, the EA guidance on air emissions risk assessment for your environmental permit states that the less stringent 200 µg/m^3 daily mean should be considered if ozone is below the AOT40 critical level and SO_2 is below the lower critical level of 10 µg/m^3. The VoWHDC and the adjacent local authority to the Site, the South Oxfordshire District Council (SODC) are both considered compliant with the Ozone AOT40 long term objective according to Defra[12]. For this assessment the highest background SO_2 concentration is 3.27 µg/m^3, which is comfortably below the lower critical level of 10 µg/m^3. Therefore, the NO_X daily mean will be assessed against 200 µg/m^3 within this assessment in line with the EA guidance.

2.4.3 Critical loads

Critical loads are determined for nutrient nitrogen on the type of species or habitat being affected. Critical loads have been obtained from the Air Pollution Information System (APIS)[13]. These are presented in section 4.3.2.1.

2.5 Assessment guidance.

The primary guidance documents consulted in undertaking this assessment are detailed below.

2.5.1 Environment agency.

2.5.1.1 Risk assessment for specific activities: environmental permits.

The Air Emissions section of the EA guidance[14] has been referred to in the assessment of emissions to air from the generators. Included within the AERA guidance are:

- An approach for undertaking screening assessments;
- Information on when detailed atmospheric modelling in required; and
- EALs for a range of pollutants against which impact may be assessed.

2.5.1.2 Specified generators: dispersion modelling assessment

The Dispersion Modelling Assessment Guidance[15] outlines the requirements for completing detailed dispersion modelling for specified generators for which the purpose is to generate electricity, or a group of such combustion plant located at the same site, operated by the same operator, and having the same purpose, between 1 and 50 MWth. The generators within this assessment are not classed as specified generators as their primary use is for emergency backup power, however, the guidance includes useful information on modelling methodology and results presentation, which has been utilised where relevant within this assessment.

2.5.1.3 Environmental permitting: air dispersion modelling reports.

This guidance[16] outlines the information needed in an air quality assessment that has been prepared in support of an environmental permit application.

2.5.2 Defra and environment agency 'air emissions risk assessment' guidance.

Defra and the EA have released online guidance[17] to assist in completing an air emissions risk assessment with regards to obtaining an environmental permit. It outlines methodology to calculate the impact of emissions, and the environmental standards that must be achieved. It provides screening criteria to identify process contributions that will result in an insignificant impact and will not require detailed modelling.

2.5.3 Environment agency data centre FAQ Headline approach.

This document[18] may provide relevant guidance on the approach to permitting and regulatory aspects for data centres within the context of the IED and Environmental Permitting Regulations.

Under these definitions and whilst operating under the 500-hour rule, generators used solely for back-up and emergency standby are not explicitly defined by set emission limit values or BAT conclusions.

3. Operational periods.

3.1 Generator information

The current plans include 129 backup plant for the Development. Three models of generator are proposed for the Development, however they will operate under the same scenarios. The details of the generator models are presented in Table 2. It should be noted that the selected generators included within this assessment are not the finalised spec. It is anticipated that the actual generators will have reduced pollutant emissions rates and as such, this assessment is considered worst case. Detailed generator specifications are presented in Appendix 2.

Table 2: Proposed generator models.

Model	Purpose	Rated power (kW)	Number on Site
AWS QSK23-G3	House	720	4
AWS QSK95 STD	Main	2800	122
AWS QSX15 G8	CIWB & Substation	440	3

Main generators provide the primary backup power supply to the equipment in the data centres, two of which are dedicated to act as backup in the event of any failure. The house generators provide power to life safety facilities.

Main and House generators associated with the three storey data centre 1, data centre 2 and data centre 3 have an exhaust height of 33.0 m. Main and House generators associated with the one storey data centre 4 have an exhaust of 18.0 m. The CIWB generators have an exhaust height of 11.3 m and the Substation generator has an exhaust height of 1.5 m.

The specified generator models for the main generators meet the emissions requirements of 2g TA-Luft in line with BAT.

3.2 Scenarios.

The backup plant are only to be used for testing purposes in line with the routine testing and maintenance schedule or in the event of an emergency power outage in the event of a National Grid failure. A description of each scenario is presented in Table 3.

Table 3: Details of the modelled scenarios.

Scenario	Description	Hours per generator	Total operational hours per annum	Generator Load (%)
1 (Testing)	Biweekly service test. Each generator tested for up to 15 minutes at 10% load every two weeks. Generators tested one at a time.	6.5	838.5	10
2 (Testing)	Biannual service test. Each generator tested one at a time for up to 4 hours twice annually. Generators tested at 100% load	8	1032	100
3 (Maintenance)	Maintenance testing. Each generator tested individually for 10 cumulative hours over a year. Generators tested at 100% load.	10	1290	100
4 (Outage)	Emergency scenario considering a national grid outage for 72 hours. All generators operating at 100% load.	72	72	100

The testing and maintenance scenarios have been represented in the model by running each generator within the Development individually. The worst-case concentrations at each sensitive receptor from the individual generators are then presented in this report.

For Scenario 1, the generators will be tested at a 10% load. In the absence of emissions data for 10% load, these generators have been modelled at a load of 25% for the House and Main generators, and 20% for the CIWB & substation generators. This is considered to be representative of conservative emissions levels.

For annual mean concentrations the model has been run for a full year and factored by the cumulative number of hours the backup generators will be operational for during the relevant testing scenario divided by the total number of hours in the dataset (8,760 hours per year & 8,784 for a leap year). The cumulative hours for each scenario are presented in Table 3. This allows the model to capture all worst-case meteorological conditions within the year.

The contributions from the testing and maintenance scenarios (Scenarios 1-3) have been combined to capture the total annual pollutant increases for the Development. For the short-term assessment periods, the worst-case contribution from the testing and maintenance scenarios (Scenarios 1-3) have been presented. The combined testing and maintenance schedule equates to less than 500 hours of operation per generator per year, which is below the criteria of 500 hours per year per generator, therefore the installation is exempt from the ELVs.

Scenario 4 represents a 72-hour outage scenario with all generators operating at full capacity. This is the only scenario in which more than one generator would be operational simultaneously. The likelihood of this occurring is considered to be extremely low due to the Site being supplied by the existing substation at Didcot Power Station in addition to a new substation being provided within the Development. This will be configured in a dual feed system, therefore in the event of a loss of supply from a single source, 50% of the Site will be powered from the alternate source, while the remaining 50% will utilise the emergency backup generators temporarily until power is restored. Furthermore, the generators will be configured in the N+1 system, which ensures availability of power in the event of a component failure. These will ensure resilience to the power supply for the Development as there is the likelihood of an outage at both substations simultaneously is considered highly unlikely. As such, the 72-hour outage scenario has been included to ensure a highly conservative and robust assessment but is not expected to occur in operation.

The overall reliability of supply for the National Grid Electricity Transmission (NGET) system during 2023 – 2024 was 99.999930%[19]. During 2023-24, there were 627 NGET system events where transmission circuits were disconnected either automatically or by urgent manual switching. The majority of these events had no impact on electricity users with only 17 resulting in loss of supplies to customers. This highlights how unlikely it is that a 72-hour outage would occur at the Development.

Hypergeometric probability distribution is the EA's recommended statistical approach for the assessment of short-term air quality impacts when combustion plant is in operation for a limited number of hours per year. This is a method of accounting for the worst-case meteorological conditions during a year.

A hypergeometric distribution is a discrete probability distribution that can be used to determine the probability that a source, which only operates for a limited number of hours per year, will lead to an exceedance of an AQO. This is achieved through calculating the number of hourly values from a dataset (8,760 hours per year, 8,784 hours for a leap year) that would need to exceed the respective criteria before the overall chance of exceeding the AQO reaches 5% during the standard testing schedule and outage scenario. In this assessment, the percentiles that represent a 5% risk of exceedance have been used to identify the potential for pollutants to exceed the relevant objective. Further detail on the modelled percentiles is presented in section 4.7.1 and Appendix 2.

4. Methodology of assessment.

4.1 Existing air quality in the study area.

A baseline air quality review was undertaken to determine the existing air quality in the vicinity of the Site. This desk-top study was undertaken using the following sources:

- Air quality data for VoWHDC, including a review of VoWHDC air quality reports and local monitoring data[20];
- Background pollution maps taken from Defra's Local Air Quality Management (LAQM) website[21];
- Pollution Inventory from the Environment Agency[22]
- The UK Ambient Air Quality Interactive Map[23];
- Ordnance Survey data and aerial photography from Google Maps.

4.2 Energy impacts.

Potential air quality impacts associated with the generators at the Proposed Development have been modelled using the ADMS 6 (v6.0.2) dispersion modelling software. ADMS 6 is an extensively validated Gaussian plume air dispersion model, and is used by regulators, government departments, consultancies and industry. The model is able to simulate the entrainment of the plume in the wake of buildings.

The assessment considers the emissions of NO_2, NO, PM_{10}, SO_2, CO and benzene at existing human health and ecological receptors.

It should be noted that to ensure a worst case approach, it has been assumed throughout this assessment that benzene represents 100% of HC emissions. In reality benzene emissions are anticipated to be a small percentage of the VOCs emitted during the operation of the backup plant.

4.3 Sensitive receptors.

4.3.1 Human health receptors.

Existing sensitive receptors to human health impacts from the operation of the proposed diesel generators have been considered in this strategic modelling review. These receptors have been identified based on worst-case nearby human exposure to emissions from the Site. Receptor locations have been determined based on sensitivity modelling which identified the locations where the plume is anticipated to ground. These receptor locations are presented in Table 4 and Figure 2.

Table 4: Modelled existing human health receptor locations.

Human Health Receptor ID	Receptor Type	Easting	Northing	Height (m)
R1	Industrial	451220	191544	1.5
R2	Industrial	450564	191662	1.5
R3	Residential	451543	191141	1.5
R4	Industrial	450344	192234	1.5
R5	Residential	452215	192175	1.5
R6	Residential	451195	191008	1.5
R7	Residential	450977	191098	1.5
R8	Industrial	450186	192357	1.5
R9	Residential	451341	190918	1.5
R10	Residential	452334	192403	1.5

Human Health Receptor ID	Receptor Type	Easting	Northing	Height (m)
R11	Industrial	451662	193017	1.5
R12	Residential	452396	191464	1.5
R13	Residential	450005	192653	1.5
R14	Residential	449958	192534	1.5
R15	Residential	452493	191702	1.5
R16	Residential	450153	193038	1.5
R17	Residential	450801	190820	1.5
R18	Industrial	451451	193176	1.5
R19	School	449837	192520	1.5
R20	Residential	452441	192808	1.5
R21	Residential	452418	191044	1.5
R22	School	451185	190551	1.5
R23	Residential	450522	190643	1.5
R24	School	452636	191067	1.5
R25	Residential	452529	193162	1.5
R26	Industrial	450344	193702	1.5
R27	School	451964	190259	1.5
R28	School	451639	190168	1.5
R29	Healthcare	452041	190218	1.5
R30	Residential	449285	191383	1.5
R31	School	452463	190410	1.5
R32	Residential	450587	193908	1.5
R33	Residential	452519	193484	1.5
R34	School	450790	189952	1.5
R35	Residential	452382	193708	1.5
R36	Healthcare	453120	190739	1.5
R37	Residential	451205	194159	1.5
R38	Healthcare	451357	189786	1.5
R39	Residential	449028	192493	1.5
R40	School	453117	190538	1.5
R41	Healthcare	451422	189690	1.5
R42	Residential	450997	194294	1.5
R43	Residential	448826	192083	1.5

Human Health Receptor ID	Receptor Type	Easting	Northing	Height (m)
R44	School	450397	189920	1.5
R45	Residential	450173	194887	1.5
R46	Residential	450864	195024	1.5
R47	School	450760	195059	1.5
R48	Residential	454177	193474	1.5
R49	Residential	451142	195408	1.5
R50	Industrial	452622	195015	1.5
R51	School	451350	195459	1.5
R52	Residential	449744	195606	1.5
R53	Residential	453345	195089	1.5
R54	Residential	450208	195823	1.5
R55	School	453375	195337	1.5
R56	Residential	451931	196262	1.5
R57	Residential	450533	196731	1.5
R58	Healthcare	449646	196674	1.5
R59	Residential	450007	196836	1.5
R60	Industrial	451318	197266	1.5
R61	Healthcare	450568	197312	1.5

Receptors greater than 1 km away from the Site where step 1 of the EA screening criteria has determined impacts to be insignificant have not been presented in the results section of this report as there are other receptors that can be considered worse case representations of these receptors. Full results are provided in Appendix 3.

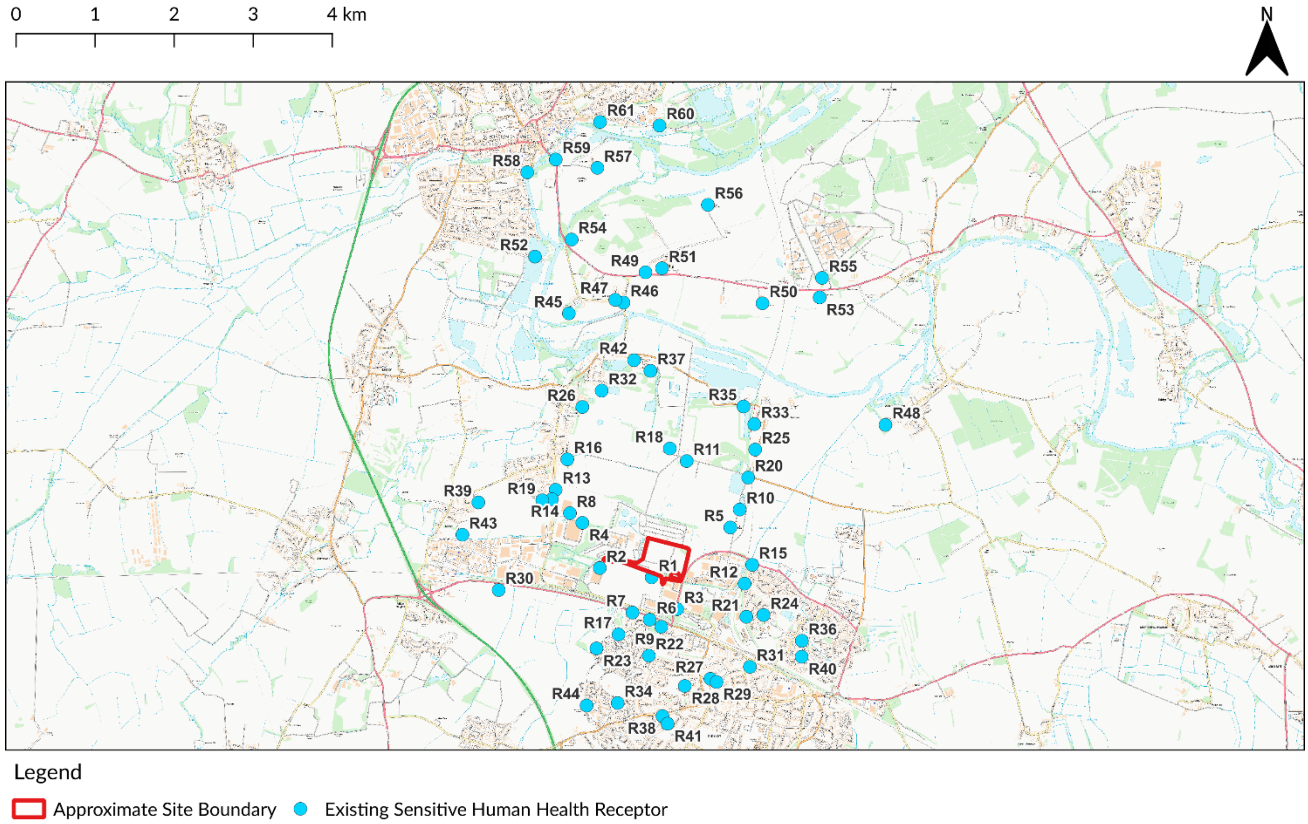

Figure 2: Existing receptors in the vicinity of the Site. Contains Ordnance Survey Data © Crown Copyright 2024.

It should be noted that the existing receptors identified above are considered to be worst-case locations in terms of sensitivity to poor air quality. However, this is not an exhaustive list and there may be other locations within the vicinity of the Site which may experience air quality impacts as a result of emissions generated by the installation that have not been individually assessed, but contour plots have been included to cover these.

In addition, impacts have been modelled across a grid at ground level (1.5 m) to cover the surrounding area. The extent for this grid is presented in Table 5.

Table 5: Modelled grid extent.

Scenario		Start	Finish	Number of points
4 (10 km x 10 km, 100 m resolution)	X	446328	456328	101
	Y	190040	200040	101
	Z	1.5	1.5	1
1, 2 & 3 (2 km x 2 km, 20 m resolution)	X	450600	452600	101
	Y	191190	193190	101
	Z	1.5	1.5	1

4.3.2 Ecological receptors.

The EA Guidance on AERAs outlines which ecological sites should be considered as sensitive receptors within dispersion modelling studies. They are:

- SPAs, SACs, SSSIs or Ramsar sites within 15 km of the installation; and

– NNRs, LNRs, LWS and Ancient Woodland within 2 km of the installation.

Within this range there are 27 SSSIs, 3 SACs and 1 Ancient Woodland. The closest point to the Site along the boundaries of these areas have been modelled in this assessment. The location of modelled ecological receptors are presented in Table 6 and Figure 3.

Table 6: Modelled existing ecological receptor locations.

Name	Easting	Northing
Appleton Lower Common SSSI	442558	200729
Ashridge Wood SSSI	450020	178214
Aston Upthorpe Downs SSSI	454465	183406
Barrow Farm Fen SSSI	446816	197575
Brasenose Wood and Shotover Hill SSSI	456923	205912
Cothill Fen SAC	446259	199864
Cothill Fen SSSI	445768	199486
Culham Brake SSSI	450882	196455
Cumnor SSSI	446113	203255
Dry Sandford Pit SSSI	446790	199480
Frilford Heath, Ponds and Fens SSSI	444031	198291
Holies Down SSSI	459408	179853
Hurst Hill SSSI	447539	204211
Iffley Meadows SSSI	452329	204421
Lamb and Flag Quarry SSSI	438018	197445
Langley's Lane Meadow SSSI	439106	201483
Lardon Chase SSSI	458744	180911
Little Wittenham SAC	457200	192861
Littlemore Railway Cutting SSSI	453069	202744
Lye Valley SSSI	454757	205812
Magdalen Grove SSSI	451970	206506
Moulsford Downs SSSI	457799	182654
New Marston Meadows SSSI	452211	207215
Oxford Meadows SAC	449395	208600
Port Meadow with Wolvercote Common & Green SSSI	449686	207988
Rock Edge SSSI	454988	206461
Streatley Warren SSSI	455263	180800
Sugworth SSSI	451282	200778
Warren Bank SSSI	465338	185724
Wytham Woods SSSI	445821	207380

Name	Easting	Northing
Ancient Woodland	453084	192021

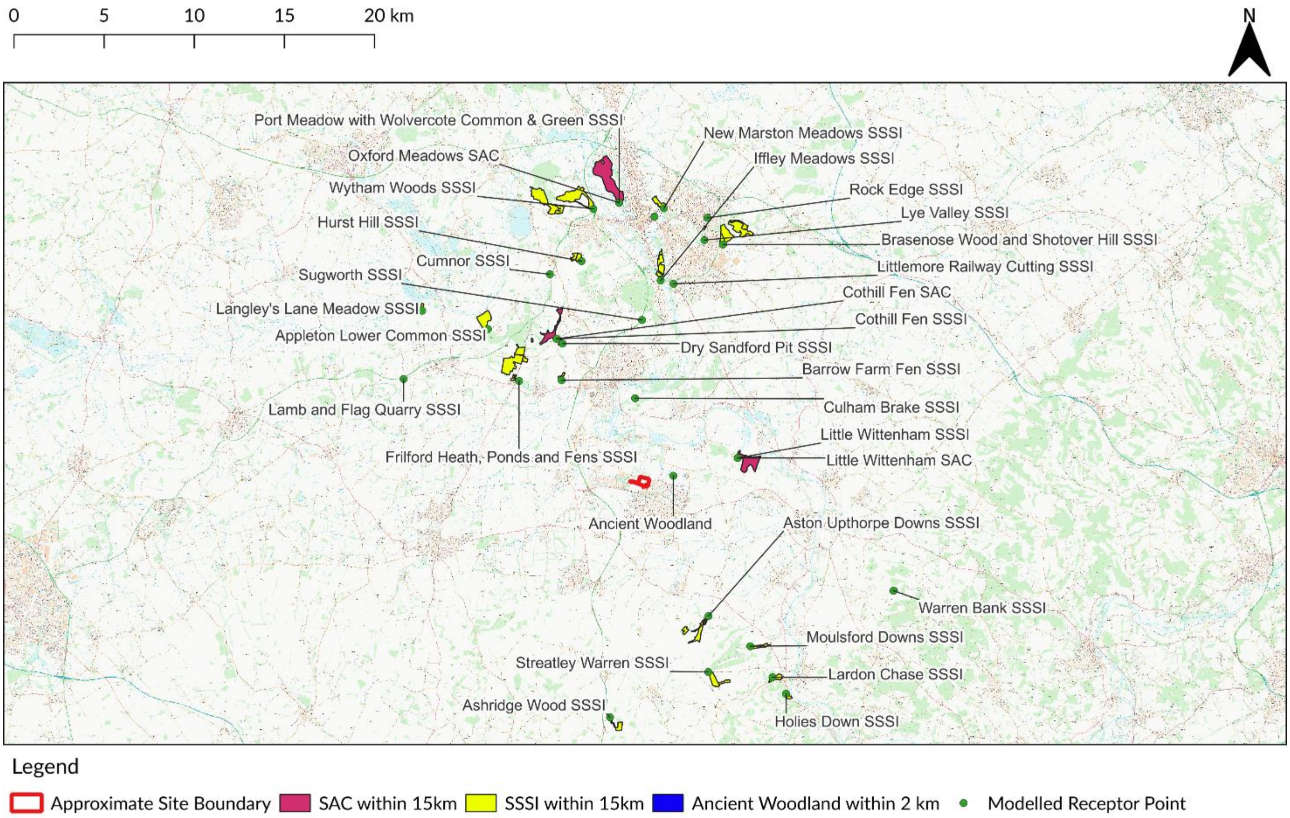

Figure 3: Modelled ecological receptor locations. Contains Ordnance Survey Data © Crown Copyright 2024.

4.3.2.1 Critical levels and critical loads.

Critical levels and critical loads for this assessment have been obtained from APIS. For the ecological sites considered in this assessment, the most stringent critical levels and loads from the habitats they comprise have been used.

As Ancient Woodland ecological sites are not presented by APIS, critical levels and loads have been taken from a representative unmanaged woodland habitat on APIS as a reasonable conservative approach.

Table 7: Relevant critical levels and critical loads for the assessed ecological receptors.

Name	Nitrogen Critical Load Range (kg N/ha/yr)	NOx Critical Level (ug/m^3)	SO_2 Critical Level (ug/m^3)	Minimum Critical Load Nitrogen Acidification (keq/ha/yr)	Minimum Critical Load Sulphur Acidification (keq/ha/yr)
Appleton Lower Common SSSI	15 - 20	30	10 - 20	0.36	10.73
Ashridge Wood SSSI	15 - 20	30	10 - 20	0.14	1.82
Aston Upthorpe Downs SSSI	10 - 20	-	-	0.86	4.00
Barrow Farm Fen SSSI	10 - 15	30	10 - 20	0.14	10.70

Name	Nitrogen Critical Load Range (kg N/ha/yr)	NOx Critical Level (ug/m^3)	SO_2 Critical Level (ug/m^3)	Minimum Critical Load Nitrogen Acidification (keq/ha/yr)	Minimum Critical Load Sulphur Acidification (keq/ha/yr)
Brasenose Wood and Shotover Hill SSSI	5 - 15	30	10	0.14	0.45
Cothill Fen SAC	10 - 20	30	10	0.14	0.69
Cothill Fen SSSI	10 - 15	30	10 - 20	0.14	0.69
Culham Brake SSSI	-	30	20	-	-
Cumnor SSSI	-	-	-	-	-
Dry Sandford Pit SSSI	5 - 10	30	10	0.89	0.22
Frilford Heath, Ponds and Fens SSSI	5 - 15	30	10	-	-
Holies Down SSSI	10 - 20	30	10 - 20	0.86	4.00
Hurst Hill SSSI	6 - 10	30	10	-	-
Iffley Meadows SSSI	10 - 20	30	20	1.07	4.00
Lamb and Flag Quarry SSSI	-	-	-	-	-
Langley's Lane Meadow SSSI	10 - 20	30	20	1.07	4.00
Lardon Chase SSSI	10 - 20	30	10 - 20	0.86	4.00
Little Wittenham SAC	-	-	-	-	-
Littlemore Railway Cutting SSSI	-	-	-	-	-
Lye Valley SSSI	15 - 25	30	10 - 20	-	-
Magdalen Grove SSSI	-	-	-	-	-
Moulsford Downs SSSI	10 - 20	30	10 - 20	-	-
New Marston Meadows SSSI	10 - 20	30	10 - 20	0.86	4.00
Oxford Meadows SAC	10 - 20	30	10 - 20	0.86	4.00
Port Meadow with Wolvercote Common & Green SSSI	10 - 20	30	20	0.86	4.00
Rock Edge SSSI	-	-	-	0.86	4.00
Streatley Warren SSSI	10 - 20	30	10 - 20	-	-
Sugworth SSSI	-	-	-	0.86	4.00
Warren Bank SSSI	10 - 20	30	10 - 20	-	-
Wytham Woods SSSI	10 - 20	30	10 - 20	0.86	4.00
Ancient Woodland	10 - 20	30	-	0.14	10.74
"-" indicates that no relevant criteria for the habitat types within the ecological site provided APIS for the ecological site. Where no sensitive habitat types are present, the relevant critical load/level has not been assessed.					

Four of the listed ecological receptors do not have habitats with critical levels or loads for the considered pollutants available on APIS. These ecological sites do not contain habitats considered to be sensitive to the assessed pollutants. As such, these receptors have not been considered further in this assessment.

4.4 Human health background concentrations.

Defra's background concentrations for the 1 km x 1 km grid square that the Site falls within has been used for NO_2, NO_x, PM_{10}, SO_2, CO and benzene background concentrations in the assessment. 2024 has been used as the background year, where data is available. In the case of SO_2 and CO the latest available year is 2001, and for benzene it is 2010. For short term concentrations, the annual mean background is doubled, in line with the EA guidance outlined in Section 4.10.1. The annual mean background concentrations for all assessed pollutants are listed in Table 8 respectively.

Table 8: Annual mean background concentration for assessing human health receptors.

Annual Mean Background Concentration Utilised within this Assessment ($\mu g/m^3$)						
Receptors	NO_2	NO_x	PM_{10}	SO_2	CO	Benzene
R1, R3, R6	8.55	11.04	12.52	3.27	293	0.28
R2, R7	8.31	10.70	12.40	3.06	293	0.27
R4, R8, R13	9.35	12.18	13.15	2.95	284	0.25
R5, R10, R20	7.79	10.00	13.12	3.27	277	0.24
R9, R22, R27, R28	8.18	10.52	12.57	2.09	290	0.27
R11, R18	7.79	10.00	13.14	3.13	280	0.25
R12, R15, R21, R24	8.34	10.75	12.97	2.24	286	0.26
R14, R19, R39	7.91	10.16	12.93	2.86	282	0.24
R16, R26, R32	7.91	10.16	12.45	2.87	285	0.25
R17, R23	7.35	9.39	13.24	2.30	290	0.26
R25, R33, R35	7.84	10.06	13.04	3.25	276	0.23
R29, R31	8.62	11.14	12.06	2.30	282	0.26
R30	9.61	12.52	13.18	2.80	283	0.24
R34, R44	7.37	9.42	13.84	3.28	291	0.25
R36, R40	8.07	10.37	11.97	2.35	281	0.25
R37	9.24	12.02	12.41	2.96	280	0.24
R38, R41	8.17	10.51	12.52	2.10	290	0.26
R42, R45	8.38	10.82	11.88	2.84	284	0.25
R43	7.65	9.80	12.33	2.91	277	0.22
R46, R47, R54	8.05	10.36	12.57	2.55	315	0.30
R48	7.16	9.14	12.02	2.13	271	0.22
R49, R51	7.93	10.19	12.88	2.07	305	0.29

Annual Mean Background Concentration Utilised within this Assessment (µg/m^3)						
Receptors	NO_2	NO_x	PM_{10}	SO_2	CO	Benzene
R50	8.15	10.49	12.53	2.15	294	0.26
R52	8.53	11.01	12.07	2.82	309	0.28
R53, R55	8.33	10.74	12.43	2.14	289	0.25
R56	8.20	10.57	11.88	2.08	313	0.30
R57, R59	8.18	10.54	12.47	2.40	326	0.32
R58	9.43	12.27	12.34	2.81	322	0.31
R60	8.26	10.64	11.86	2.91	320	0.31
R61	9.44	12.29	12.82	2.96	333	0.33

4.5 Ecological site background concentrations.

The background concentrations for the modelled ecological receptors and the nutrient nitrogen and acidification values for the grid square that the receptors fall within have been taken from APIS. Where ecological sites overlap multiple grid squares, the maximum concentrations have been presented. The relevant background concentrations for assessing impacts on ecological receptors are displayed in Table 9 below.

Table 9: Background concentrations for assessing ecological receptors.

Receptors	NO_X (µg/m^3)	SO_2 (µg/m^3)	Nutrient Nitrogen (kg N/ha/a)	Acidification Nitrogen (keq/ha/a)
Appleton Lower Common SSSI	10.2	0.9	8.8	0.7
Ashridge Wood SSSI	10.7	0.8	9.3	0.7
Aston Upthorpe Downs SSSI	8.5	0.7	8.8	0.7
Barrow Farm Fen SSSI	12.1	1.0	8.0	0.6
Brasenose Wood and Shotover Hill SSSI	22.5	2.1	10.4	0.8
Cothill Fen SAC	10.5	1.1	9.3	0.7
Cothill Fen SSSI	10.5	1.1	9.3	0.7
Culham Brake SSSI	12.3	1.2	8.2	0.6
Cumnor SSSI	11.1	1.1	9.8	0.8
Dry Sandford Pit SSSI	9.7	0.9	8.7	0.7
Frilford Heath Ponds and Fens SSSI	9.2	0.9	8.6	0.7
Holies Down SSSI	11.0	0.9	11.0	0.8
Hurst Hill SSSI	11.1	1.1	10.4	0.8
Iffley Meadows SSSI	16.3	1.5	9.9	0.8
Lamb and Flag Quarry SSSI	8.8	0.7	7.9	0.6
Langley's Lane Meadow SSSI	9.8	0.9	8.0	0.6

Receptors	NO_X (µg/m³)	SO_2 (µg/m³)	Nutrient Nitrogen (kg N/ha/a)	Acidification Nitrogen (keq/ha/a)
Lardon Chase SSSI	11.0	0.9	11.2	0.8
Little Wittenham SAC	11.1	1.0	7.9	0.6
Little Wittenham SSSI	11.1	1.0	7.9	0.6
Littlemore Railway Cutting SSS	15.3	1.6	9.6	0.7
Lye Valley SSSI	14.2	1.6	9.5	0.8
Magdalen Grove SSSI	21.0	1.4	9.5	0.8
Moulsford Downs SSSI	9.4	0.7	11.2	0.8
New Marston Meadows SSSI	15.9	1.5	9.4	0.8
Oxford Meadows SAC	15.7	1.4	10.2	0.8
Port Meadow with Wolvercote Common & Green SSSI	15.7	1.4	10.2	0.8
Rock Edge SSSI	18.8	2.1	9.9	0.8
Streatley Warren SSSI	8.8	0.7	10.9	0.8
Sugworth SSSI	13.2	1.2	9.4	0.7
Warren Bank SSSI	9.0	0.7	11.8	0.9
Wytham Woods SSSI	14.8	1.3	11.0	0.8
Ancient Woodland	9.4	0.7	11.2	0.8

These background concentrations have been obtained from APIS using the latest background maps available for 2021. This is considered to be a conservative approach as background concentrations are expected to improve since 2021 and will be lower in the opening year of the Development.

4.6 Plant emission rates.

The emissions rates for the generator models specified for the Development have been provided by the generator supplier, Cummins, and have been presented in Table 10. Further information on model inputs and generator data and emission sheets have been provided in the submission pack.

Table 10: Plant emissions rates for modelled pollutants

Pollutant	Emission Rate (g/s)					
	AWS QSK23-G3 (House)		AWS QSK95 STD (Main)		AWS QSX15 G8 (CIWB and Sub-station)	
	100% Load	25% Load	100% Load	25% Load	100% Load	20% Load
NO_X	1.992875	0.538056	5.394383	1.348267	1.310222	0.291378
CO	0.858675	0.231833	0.500744	0.125156	0.106083	0.023592
PM_{10}	0.018725	0.005056	0.136567	0.034133	0.005583	0.001242
SO_2	0.0428	0.011556	0.00569	0.001422	-	-
HC as Benzene	0.001873	0.000506	0.398319	0.099556	0.009306	0.002069
"-" indicates that no emissions data available.						

4.7 Calculation of long and short term emissions.

4.7.1 Human health.

In the testing and maintenance scenarios, each generator has been run all year round, with a factor then being applied to determine the annual mean PC for the number of hours run from each generator. The scenarios have been factored by the cumulative hours presented in Table 3 divided by the number of hours in a year (8760 for 2022 & 2023, 8784 for 2024) in line with the EAs guidance for an Air Emissions Risk Assessment for Environmental Permits.

For short term impacts, different percentiles have used within the assessment scenarios to represent the highest permissible concentration for each pollutant for the relevant time period. The percentiles used within the outage scenario represent the 5% risk of the short term AQO being exceeded for the number of operating hours. The 1% risk percentile has been included for information, based on the worst case assessment approach but the 5% risk percentile has been used in this assessment and is considered a reasonable level of risk as to the likelihood of the relevant objectives being exceeded.

It should be noted that percentiles differ for the modelled leap year, 2024. The percentiles used within this assessment, where applicable, are displayed for each short term objective in Table 11 for 2022 & 2023, and Table 12 for 2024.

Table 11: Short term air quality objectives and relevant percentiles for evaluation of impacts (2022 & 2023).

Pollutant	Time period	Objective (µg/m^3)	Permissible	Percentile							
				Scenario 1 - Testing		Scenario 2 - Testing		Scenario 3 - Maintenance		Scenario 4 - Outage	
				1% Risk	5% Risk	1% Risk	5% Risk	1% Risk	5% Risk	1% Risk	5% Risk
NO_2	1-hour Mean	200	18 hours per year	98.72	98.48	98.95	98.76	99.16	99.01	84.74	81.95
PM_{10}	24-hour Mean	50	35 days per year	-	-	32.60	27.95	47.67	43.56	-	-
SO_2	24-hour Mean	125	3 days per year	97.26	95.89	97.81	96.71	98.08	97.26	-	-
	1-hour Mean	350	24 hours per year	98.72	98.48	98.50	98.28	98.79	98.62	77.81	74.55
	15-minute mean	266	35 x 15-minute periods per year	99.68	99.62	99.41	99.34	99.53	99.47	91.65	90.57
CO	8-hour mean	10000	None	99.82	99.63	99.91	99.97	99.91	99.98	98.26	95.89
	1-hour mean	30000	None	99.98	99.95	99.99	99.97	99.99	99.98	99.79	99.51
Benzene	1-hour Mean	195	None	99.98	99.95	99.99	99.97	99.99	99.98	99.79	99.51

Note: "–" During both the testing scenarios and the outage scenario there will not be enough operational hours to lead to an exceedance of the PM_{10} 24-hour mean AQO (allowing 35 exceedances) and during the outage scenario there will not be enough operational hours to cause an exceedance of SO_2 24-hour mean AQO allowing (3 exceedances).

Table 12: Short term air quality objectives and relevant percentiles for evaluation of impacts (2024).

Pollutant	Time period	Objective (µg/m^3)	Permissible	Percentile							
				Scenario 1 - Testing		Scenario 2 - Testing		Scenario 3 - Maintenance		Scenario 4 - Outage	
				1% Risk	5% Risk	1% Risk	5% Risk	1% Risk	5% Risk	1% Risk	5% Risk
NO_2	1-hour Mean	200	18 hours per year	98.72	98.49	98.95	98.77	99.16	99.01	84.74	81.96
PM_{10}	24-hour Mean	50	35 days per year	-	-	32.51	27.87	47.81	43.44	-	-
SO_2	24-hour Mean	125	3 days per year	97.27	95.90	97.81	96.72	98.09	97.27	-	-
	1-hour Mean	350	24 hours per year	98.72	98.49	97.81	96.72	98.09	97.27	77.80	74.56
	15-minute mean	266	35 x 15-minute periods per year	99.68	99.62	99.41	99.34	99.53	99.47	91.65	90.57
CO	8-hour mean	10000	None	99.82	99.95	99.91	99.97	99.91	99.98	98.27	99.51
	1-hour mean	30000	None	99.98	99.95	99.99	99.97	99.99	99.98	99.80	99.51
Benzene	1-hour Mean	195	None	99.98	99.95	99.99	99.97	99.99	99.98	99.80	99.51

Note: "–" During both the testing scenarios and the outage scenario there will not be enough operational hours to lead to an exceedance of the PM_{10} 24-hour mean AQO (allowing 35 exceedances) and during the outage scenario there will not be enough operational hours to cause an exceedance of SO_2 24-hour mean AQO allowing (3 exceedances).

In line with EA Guidance[24], short-term concentrations have been multiplied by the below factors:

- 1.34 to represent a 15-minute mean concentration.
- 0.7 to represent an 8-hour mean concentration.
- 0.59 to represent a 24 hour mean concentration.

4.7.2 Ecological sites.

4.7.2.1 24-hour mean NOx.

To calculate the 24-hour mean NO_x the percentiles listed in Table 13 were used for the respective scenario to represent a 5% probability of exceedance of the 24-hour mean NOx limit. The output from ADMS was factored by 0.59 as presented above to represent a 24-mean concentration. Percentiles for the 24-hour mean NO_x were the same for standard years (2022 & 2023) and leap years (2024).

Table 13: 24-hour Mean NOx objective and relevant percentiles for evaluation of impacts.

Pollutant	Time period	Objective (µg/m³)	Permissible	Percentile							
				Scenario 1 - Testing		Scenario 2 - Testing		Scenario 3 - Maintenance		Scenario 4 - Outage	
				1% Risk	5% Risk	1% Risk	5% Risk	1% Risk	5% Risk	1% Risk	5% Risk
NO_x	24-hour Mean	200	None	100	100	100	100	100	100	99.73	98.36

4.7.2.2 Acidification and nutrient nitrogen deposition.

In order to calculate acidification and nutrient nitrogen deposition, the following deposition velocities and conversion factors have been used, as displayed in Table 14. The annual mean output from the model is first multiplied by the deposition velocity, the result is then multiplied by the conversion factors in order to be able to assess against nutrient nitrogen deposition or acidification of nitrogen or sulphur, respectively.

Table 14: Factors for conversion of annual mean concentrations to nutrient nitrogen and acid deposition.

Pollutant	Deposition Velocity (m/s)		Conversion Factor (µg/m²/s to kg N/ha/a)	Conversion Factor (µg/m²/s to keq S/ha/a)
	Woodland	Grassland		
NOx (as NO_2)	0.003	0.0015	96	6.84
SO_2	0.024	0.012	-	9.84

For ecological sites containing both woodland and grassland habitats, the worst case deposition velocity (woodland) has been used. Habitat types have been obtained from APIS.

4.7.3 NO_X to NO_2 and NO conversion

Annual mean NOx and the relevant percentile of 1-hour mean NOx concentrations have been modelled in ADMS-6. The approach recommended by Defra/EA online guidance[24] has been used to estimate annual mean NO_2 concentrations and relevant percentiles of 1-hour mean NO_2 concentrations from the modelled NO_X output assuming:

- Annual mean NO_2 concentrations = annual mean NO_X concentrations x 0.7; and
- Relevant percentiles of 1-hour mean NO_2 concentrations = Relevant percentiles of 1-hour mean NO_X multiplied by 0.35.

It has been assumed that all NO_x is NO + NO_2 and therefore NO = NO_x x 0.3.

4.8 Meteorological data.

The model has been run using meteorological data from Benson airfield for the three-year period 2022-2024 with all meteorological hours being run. The Benson airfield meteorological station is located in an RAF base approximately 11 km east of the Site and has a similar surrounding topography to the Proposed Development. Concentrations from all three years have been assessed, and worst-case concentrations from across the three meteorological years have been presented for each existing sensitive receptor location. This ensures a robust approach that captures a wide range of possible meteorological conditions in the area. Further information on the meteorological inputs is provided in Appendix 2.

4.9 Building downwash.

The buildings within and surrounding the Site can have an effect on the dispersion of emissions from the backup plant. For this assessment the buildings within the Site boundary have been included within the model. This includes the main data centres, substation, and CIWB along with the generator blocks and shrouds. The parameters of which are outlined in Table 15. The buildings included within the model are displayed in Figure 4.

Figure 4: Buildings included in the model. Contains Ordnance Survey Data © Crown Copyright and Database rights 2024.

Table 15: Modelled building parameters.

Building	Centroid X	Centroid Y	Height (m)	Length (m)	Width (m)	Angle (°)
Data centre 1	451469	191827.	28.6	71.2	223.9	104.8
Data centre 1 Generators	451518	191815	13.0	19.8	209.8	104.8
Data centre 1 Shroud	451511	191817	27.5	4.0	209.6	104.8
Data centre 2	451300	191914	28.6	68.9	233.8	193.5
Data centre 2 Generators	451312	191962	13	20.8	209.6	193.5
Data centre 2 Shroud	451310	191954	27.5	4.0	210.0	193.5
Data centre 3	451262	191770	28.6	68.9	234.1	193.5
Data centre 3 Generators'	451274	191820	13.0	20.6	210.3	193.5
Data centre 3 Shroud	451272	191811	27.5	4.0	210.2	193.5
Data centre 4	451596	191762	12.9	71.2	117.6	103.9
Data centre 4 Generators 1	451553	191801	6.1	15.4	98.0	103.9
Data centre 4 Generators 2	451575	191839	6.1	13.6	37.2	193.9
Data centre 4 Shroud 1	451561	191806	13.9	3.5	65.8	103.9
Shroud 2	451579	191833	13.9	4.6	26.1	193.9
CIWB 1	451266	191859	8.3	40.0	20.0	104.4
CIWB 2	451317	191847	4.6	8.7	9.7	193.9
Substation Building	451624	191864	6.4	37.2	17.3	103.9
Water Tanks	451209	191874	12.0	17.0	75.8	193.5

4.10 Assessment of significance.

4.10.1 Human health energy impacts.

The EA guidance for the initial screening stages for undertaking air emissions risk assessment in supporting of environmental permit applications says that the process contribution (PC) can be screened out as insignificant at human health receptors if the following criteria are met:

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

The above criteria have been used within this assessment to identify potential exceedances of the long term and short term AQOs due to emissions associated with the testing of the generators and an outage scenario.

There is also a second stage of screening if the impact cannot be screened out in the first stage. If both of the following requirements are met then no further assessment is required and impacts are likely to be insignificant. This assessment has modelled all impacts, therefore in the case that one or none of the following are met, further consideration to significance will be required.

- The short term PC is less than 20% of the short term environmental standards minus twice the long term background concentration; and
- The long term PEC is less than 70% of the long term environmental standards.

After the second stage of screening, there are no criteria to determine whether:

- PCs are significant; and
- PECs are insignificant or significant.

The judgement of significance after the second stage must therefore be based on site specific circumstances using professional judgement. The professional experience of the consultants preparing this report is set out in Appendix 5.

The EAs guidance on the undertaking of dispersion modelling for backup generators says that where the hypergeometric probability of achieving the relevant short term AQO is:

- Less than 1% - the risk of exceedance is highly unlikely;
- Less than 5% - the risk of exceedance is unlikely as long as the backup plant's operational lifetime is no more than 20 years; and
- Greater than or equal to 5% - there is a risk of exceedance and the regulator must consider if it is acceptable.

4.10.2 Ecological energy impacts.

The EA guidance for undertaking air emissions risk assessment in supporting of environmental permit applications says that PCs can be screened out as insignificant at SSSIs and SACs if the following criteria are met:

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

Emissions that affect Ancient Woodlands can be screened out as insignificant if the following criteria are met:

- The short-term PC is less than 100% of the short-term environmental standard; and
- The long-term PC is less than 100% of the long-term environmental standard.

As with human health, the EAs guidance on the undertaking of dispersion modelling for backup generators and the second stage of screening and judgement of significance at the detailed modelling stage is the same for ecological sites.

4.11 Limitations and assumptions.

In order to undertake a robust assessment, the following assumptions have been made throughout this assessment:

- The model has been run for all hours of the day. In practice, testing and maintenance is only likely to happen during daytime working hours (9 am to 5 pm). By modelling all hours, all potential meteorological conditions are included and represented in the model. This ensures that worst-case conditions are included.
- The model has been run for three years of meteorological data. The maximum impact from all three years at each existing receptor location has been presented. This is considered to be representative of worst-case meteorological conditions.
- In the absence of emissions data for 10% load, scenario 1 has been modelled with emissions data at a load of 25% for the House and Main generators, and 20% for the CIWB & Sub-station generators.
- For the testing and maintenance scenarios, each generator has been modelled individually. The worst-case impact at each existing receptor has been presented.

We are also considering the limitation of the ADMS 6 model, which is an approved model by the EA for this type of assessment:

- The ADMS 6 model is a steady state model, assuming constant and continuous emissions over the time averaging period of modelling and constant meteorological conditions between the source and the receptor.

By incorporating the worst-case assumptions described above, the results should be considered as the upper limit of the model uncertainty. The actual predicted ground concentrations are likely to be lower than those reported in this assessment.

5. Baseline environment.

This section sets out the available information on air quality in the vicinity of the Site.

5.1 Air quality monitoring data.

5.1.1 Nitrogen dioxide.

VoWHDC collaborate on air quality monitoring with the neighbouring local authority, SODC. According to the most recent VoWHDC and SODC air quality annual status report (ASR) (2024)[20], these councils operate four automatic monitoring locations at roadside and kerbside locations. The closest monitoring location to the Site is Abingdon CA, located approximately 4.8 km to the north.

It should be noted that the pollutant concentrations recorded in 2020 and 2021 are lower than previous years as a direct result of reduced traffic levels during the COVID-19 pandemic. As such the pollutant concentrations recorded in 2020 and 2021 are not considered to be representative of 'normal' air quality conditions.

However, 2022 and 2023 monitoring data is available and is considered representative of a return to 'normal' air quality conditions. As such, 2023 has been presented as the baseline year as this is the latest year of available representative data. The one automatic monitoring location within 5 km of the Site is presented in Table 16 and illustrated in Figure 5.

Table 16: NO_2 Automatic monitoring locations within 5 km of the Site.

Monitoring station and distance (km) from site boundary (approx.)	Objective	2019	2020	2021	2022	2023
NO_2						
Abingdon CA, 4.8 km	Annual mean concentration (µg/m^3)	22	16	17	18	18
	Number of hours with concentrations >200 µg/m^3	0	0	0	0	0

As indicated by Table 16, Abingdon CA has not recorded any exceedances of the annual mean or 1-hour mean NO_2 AQOs between 2019 and 2023.

In addition to automatic monitoring locations, VoWHDC and SODC operated 129 passive diffusion tube monitoring locations to record annual mean NO_2 concentrations in 2023. Within 5 km of the Site, there are 9 passive diffusion tube monitoring locations operated by VoWHDC and SODC. The annual mean concentrations for those located within the vicinity of the Site are shown in Figure 5 and detailed in Table 17.

Table 17: Passive diffusion tube monitoring results within 2 km of the Site.

Site ID	Site Type	Distance (m) from Site (approx.)	Annual Mean NO_2 Concentration (µg/m^3)				
			2019	2020	2021	2022	2023
SS79	Roadside	540	17	13	12	12	12
SS75	Roadside	930	27	20	20	20	20
SS78	Kerbside	1,100	20	15	16	14	16
SS74	Kerbside	1,230	23	17	17	17	17
SS76	Kerbside	1,575	24	19	17	20	20
VS35	Kerbside	1,850	21	14	14	14	15
VS47	Kerbside	1,850	26	15	15	17	16

Site ID	Site Type	Distance (m) from Site (approx.)	Annual Mean NO_2 Concentration (µg/m^3)				
			2019	2020	2021	2022	2023
VS48	Kerbside	1,890	25	14	16	17	15
SS72	Roadside	1,970	24	19	19	21	20
Notes: Concentrations in **bold** indicate an exceedance of the relevant AQO. Likely exceedance of the NO_2 short term AQO of 200 µg/m^3 over the permitted 18 hours per year are shown in **bold** and underlined.							

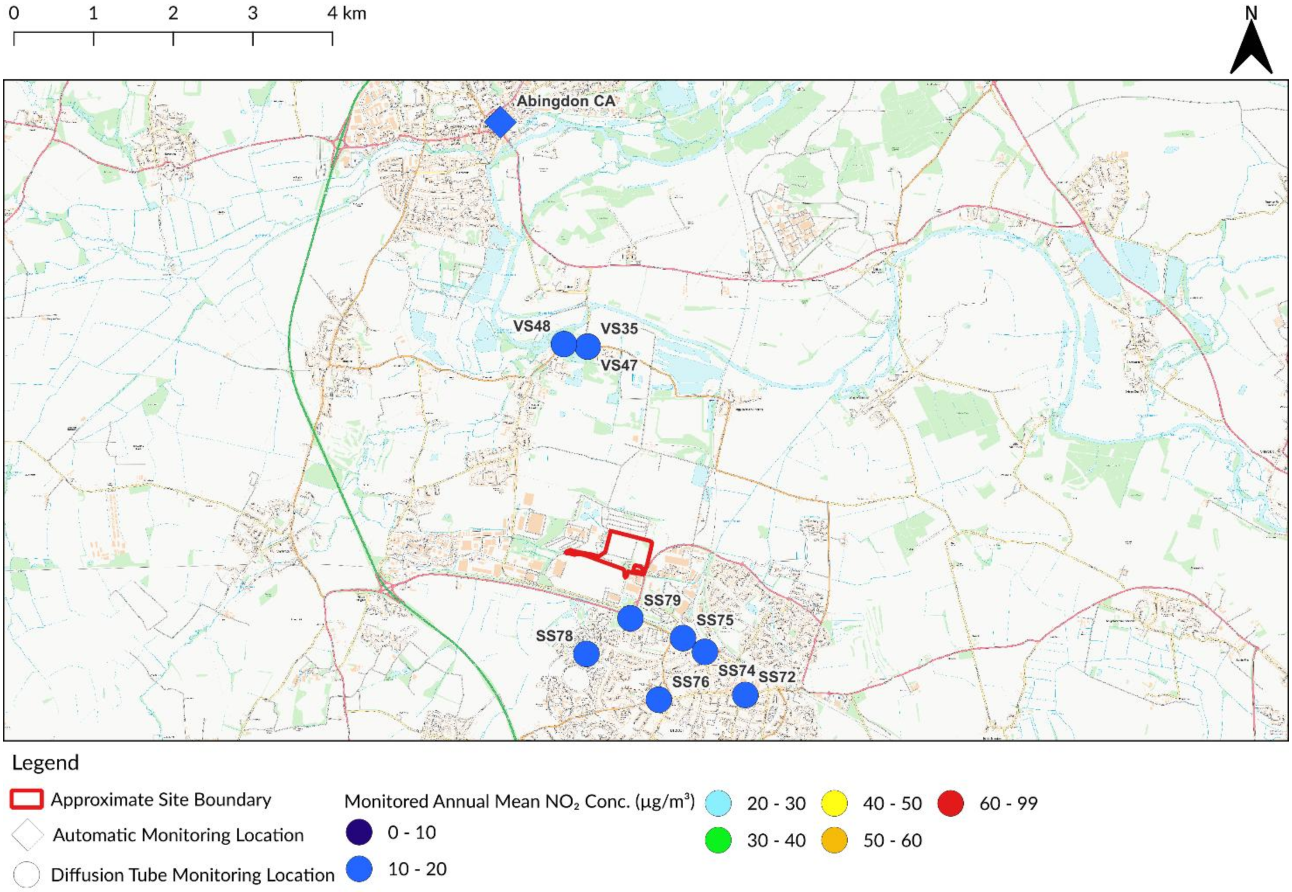

Figure 5: Location of NO_2 monitoring sites in the vicinity of the Site. Contains OS Data © Crown Copyright and Database rights 2024.

As indicated by Table 17, the annual mean NO_2 AQO has not been exceeded at any monitoring location in the vicinity of the Site between 2019 and 2023.

Additionally, as outlined in LAQM.TG(22), an annual mean concentration of 60 µg/m^3 or above is often used to indicate a possible exceedance of the 1-hour mean NO_2 AQO. This has not occurred at any passive diffusion tube monitoring location in the vicinity of the Application Site between 2019 and 2023.

5.1.2 **Particulate matter (PM_{10} & $PM_{2.5}$).**

There are currently no PM_{10} or $PM_{2.5}$ monitoring locations operated by VoWHDC and SODC.

5.2 Background Air Quality Data

5.2.1 Defra Predicted Concentrations

National maps produced by Defra provide background concentrations of key pollutants for the whole of the UK[21]. These estimated concentrations are produced on a 1 km by 1 km grid basis. The Site falls into four grid squares. Predicted concentrations for these grid squares for NO_2, NO_X, PM_{10} and $PM_{2.5}$ in 2024 the model assessment year, and the current year of 2025, are shown in Table 18.

Table 18: Predicted background concentrations of NO_2, NO_X, PM_{10} and $PM_{2.5}$ in 2024 and 2025.

Year	Grid Square		Predicted Background Concentration (µg/m^3)			
	X	Y	NO_2	NO_X	PM_{10}	$PM_{2.5}$
2024	450500	192500	9.4	12.2	13.1	7.3
	451500	192500	7.8	10.0	12.6	6.8
	450500	191500	8.3	10.7	12.4	6.8
	451500	191500	8.6	11.0	12.5	6.9
2025	450500	192500	9.2	12.0	13.1	7.3
	451500	192500	7.7	9.8	12.5	6.8
	450500	191500	8.1	10.4	12.3	6.8
	451500	191500	8.4	10.8	12.4	6.8

As shown in Table 18, the predicted background concentrations are below the relevant air quality objectives for all pollutants.

5.2.1.1 Sulphur dioxide (SO_2).

VoWHDC and SODC do not currently monitor SO_2 concentrations. As such, Defra predicted background concentrations from the latest year of available data (2001) for the grid squares in which the Site is located have been used to understand the baseline conditions. The Defra predicted background concentration are presented in Table 19.

Table 19: Predicted background concentrations of SO_2 in 2001.

Grid square		Predicted Background Concentration (µg/m^3)
X	Y	SO_2
450500	192500	2.7
451500	192500	2.8
450500	191500	2.4
451500	191500	2.4

5.2.1.2 Carbon monoxide (CO).

VoWHDC and SODC do not currently monitor CO concentrations. As such, Defra predicted background concentrations from the latest year of available data (2001) for the grid squares in which the Site is located have been used to understand the baseline conditions. The Defra predicted background concentration are presented in Table 20.

Table 20: Predicted background concentrations of CO in 2001.

Grid square		Predicted Background Concentration (µg/m^3)
X	Y	CO
450500	192500	261
451500	192500	270
450500	191500	260
451500	191500	261

5.2.1.3 Benzene

VoWHDC and SODC do not currently monitor benzene concentrations. As such, Defra predicted background concentrations from the latest year of available data (2010) for the grid squares in which the Site is located have been used to understand the baseline conditions. The Defra predicted background concentration are presented in Table 21.

Table 21: Predicted background concentrations of benzene in 2010.

Grid square		Predicted Background Concentration (µg/m^3)
X	Y	Benzene
450500	192500	0.2
451500	192500	0.2
450500	191500	0.2
451500	191500	0.2

5.3 Industrial pollution.

A desk-based review of potential industrial sources using the UK Pollutant Release and Transfer Register[25] and the Pollution Inventory from the Environment Agency[26] identified eight potentially significant industrial or waste management sources of air pollution within 2 km of the Site, which are presented in Table 22.

Table 22: Industrial & waste management sources of air pollution within 2 km of the Site from 2018 onwards.

Source Name	Distance to the Site (m)	Source Type	Air Pollutant Release
National Gas Transmission PLC	0	Gasification, liquefaction, and refining; odorising natural gas	Controlled by environmental permit (EPR/LP3835LK)
RWE Generation UK PLC (Didcot B Power Station)	90	Combustion; any fuel =>50mw	Controlled by environmental permit (EPR/YP3930LZ)
Peak Gen Power Limited	190	Medium combustion plant and specified generator	Controlled by environmental permit (EPR/ZB3095YY)
Amazon Data Services UK Limited	225	Combustion; any fuel =>50mw	Controlled by environmental permit (EPR/LP3005BL)

Source Name	Distance to the Site (m)	Source Type	Air Pollutant Release
Waste Recycling Group (Central) Limited	250	Waste landfilling	Controlled by environmental permit (EPR/BV7001IK)
Anti-Waste Limited (Sutton Courtenay Materials Recycling Facility)	250	Recovery or a mix of recovery and disposal of non-hazardous waste involving pre-treatment of waste for incineration or co-incineration	Controlled by environmental permit (EPR/NP3890VV)
FCC Recycling (UK) Limited	925	Recovery or a mix of recovery and disposal of non-hazardous waste involving pre-treatment of waste for incineration or co-incineration	Controlled by environmental permit (EPR/BP3295ET)
APTUIT (Oxford) Limited	1,300	Pharmaceuticals; producing pharmaceuticals using chemical/biological processes	Controlled by environmental permit (EPR/MP3632FW)

As illustrated by Table 22, all industrial and waste management sources of air pollution in the vicinity of the Site are controlled by environmental permits. As such, their impacts on air quality at the Site are anticipated to be not significant.

5.4 Summary of baseline data.

In 2023, the most recent year with available representative monitoring data, there were no recorded exceedances of the annual mean NO_2 AQO or 1-hour mean NO_2 AQO within 2 km of the Application Site.

Defra predicted background concentrations have been used to identify baseline conditions for PM_{10}, $PM_{2.5}$, SO_2, CO and benzene. Concentrations of these pollutants have been taken for the grid squares containing the Site for the most recent year of data available.

Industrial and waste management sources of air pollution in the vicinity of the Site are not anticipated to have a significant impact on air quality.

6. Human health assessment.

The potential for air quality impacts on human health from the operation of the Proposed Plant are assessed in this section.

Receptors greater than 1 km away from the Site where step 1 of the EA screening criteria has determined impacts to be insignificant have not been presented in this section as there are other receptors that can be considered worse case representations of these receptors. Full results are provided in Appendix 3.

6.1 Testing and maintenance scenarios.

The following outlines the results of the dispersion modelling for the testing and maintenance scenarios. This considers the three modelled testing and maintenance scenarios (scenarios 1-3) cumulatively for the annual mean assessment and the period mean for the short-term criteria. For the short-term objectives, the worst-case impact from each individually modelled generator at each receptor location has been presented in this section.

To represent the worst-case meteorological conditions, the maximum concentration from the three modelled years (2022, 2023, 2024) has been presented for each receptor location.

6.1.1 NO_2.

Annual mean and 1-hour mean PC of NO_2 have been assessed against the annual mean and 1-hour mean objective of 40 µg/m^3 and 200 µg/m^3 respectively at existing receptors. The 5% risk of there being an exceedance of the 1-hour mean has been calculated using the percentiles presented in section 4.7.1.

6.1.1.1 Annual mean.

The annual mean PC are shown in Table 23.

Table 23: Step 1 screening of NO_2 annual mean concentrations from the combined testing and maintenance scenarios on human health.

Receptor ID	PC (µg/m^3)	PC as a % of Relevant AQO	Significance
R1	0.89	2.22	Potentially significant
R2	0.11	0.29	Insignificant
R3	0.29	0.71	Insignificant
R4	0.11	0.27	Insignificant
R5	0.46	1.15	Potentially significant
R6	0.29	0.72	Insignificant
R7	0.32	0.79	Insignificant
R8	0.09	0.23	Insignificant
R9	0.24	0.60	Insignificant
R10	0.36	0.89	Insignificant
R11	0.40	0.99	Insignificant
R12	0.13	0.33	Insignificant
R13	0.07	0.18	Insignificant
R14	0.07	0.18	Insignificant
R15	0.18	0.44	Insignificant
R16	0.08	0.20	Insignificant
R17	0.21	0.52	Insignificant

Receptor ID	PC (µg/m³)	PC as a % of Relevant AQO	Significance
R18	0.36	0.91	Insignificant
R19	0.07	0.16	Insignificant
R20	0.27	0.68	Insignificant
R21	0.10	0.25	Insignificant
R22	0.18	0.44	Insignificant

In line with step 1 of the screening process, there are two receptors where the PC exceeds 1% of the relevant criteria, and therefore they cannot be screened out under step 1. The extent of the exceedance is shown in Figure 6. Therefore, the impact at all other existing receptors can be screened out as being insignificant.

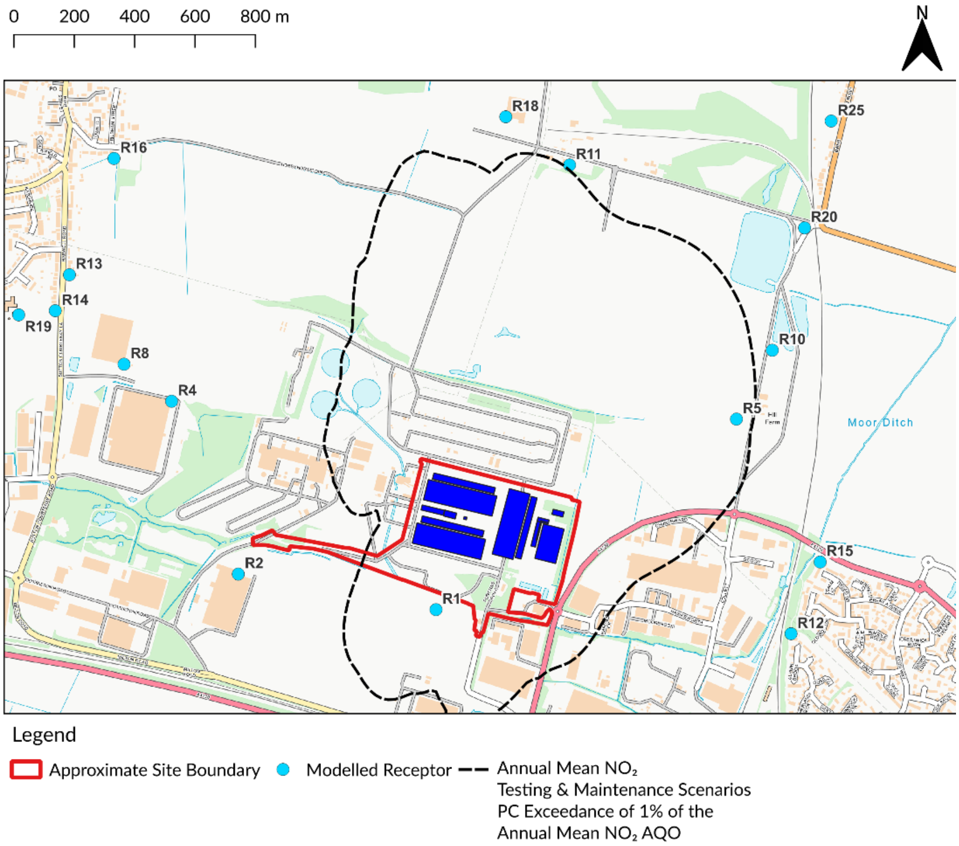

Figure 6: Extent of the PC exceedance of the annual mean NO_2 AQO within the combined testing and maintenance scenarios. Contains OS Data © Crown Copyright and Database rights 2024.

There are existing sensitive receptors located within the area exceeding 1% of the annual mean NO_2 AQO as outlined in Figure 6. Though not included within the model, industrial properties within the area exceeding 1% change will likely experience similar impacts to the discrete worst-case modelled receptors as shown in Figure 6.

Step 2 of the screening process for annual mean impacts are displayed in Table 24.

Table 24: Step 2 of screening for NO_2 annual mean concentrations from the combined testing and maintenance scenarios on human health.

Receptor ID	PEC (µg/m³)	PEC as a % of Relevant AQO	Significance
R1	9.44	23.60	Insignificant
R5	8.25	20.63	Insignificant

In line with step 2 of the screening process, there are no receptors where the PEC exceeds 70% of the annual mean NO_2 criteria. As such, the impact of the combined testing and maintenance scenarios on the annual mean NO_2 can be considered insignificant at all existing sensitive receptors.

6.1.1.2 1-hour mean.

The results for a 5% risk of exceedance of the 1-hour mean are shown in Table 25 for step 1 of the screening process.

Table 25: Step 1 of screening for 5% risk of there being an exceedance of the NO_2 1-hour mean from the combined testing and maintenance scenarios on human health.

Receptor ID	PC (µg/m³)	PC as a % of Relevant AQO	Significance
R1	21.55	10.77	Potentially significant
R2	6.56	3.28	Insignificant
R3	10.34	5.17	Insignificant
R4	4.53	2.27	Insignificant
R5	8.34	4.17	Insignificant
R6	6.91	3.45	Insignificant
R7	7.93	3.97	Insignificant
R8	4.05	2.03	Insignificant
R9	6.20	3.10	Insignificant
R10	6.70	3.35	Insignificant
R11	6.71	3.36	Insignificant
R12	5.43	2.72	Insignificant
R13	3.19	1.59	Insignificant
R14	3.13	1.57	Insignificant
R15	5.88	2.94	Insignificant
R16	3.12	1.56	Insignificant
R17	5.66	2.83	Insignificant
R18	6.89	3.45	Insignificant
R19	3.02	1.51	Insignificant
R20	5.36	2.68	Insignificant
R21	4.25	2.12	Insignificant
R22	5.22	2.61	Insignificant

There is one receptor from step 1 of the screening process where the PC as a % of the relevant AQO exceeds 10% and as such, impacts may be potentially significant, the extent of which is displayed in Figure 7. The impacts at the remaining receptors are likely to be insignificant.

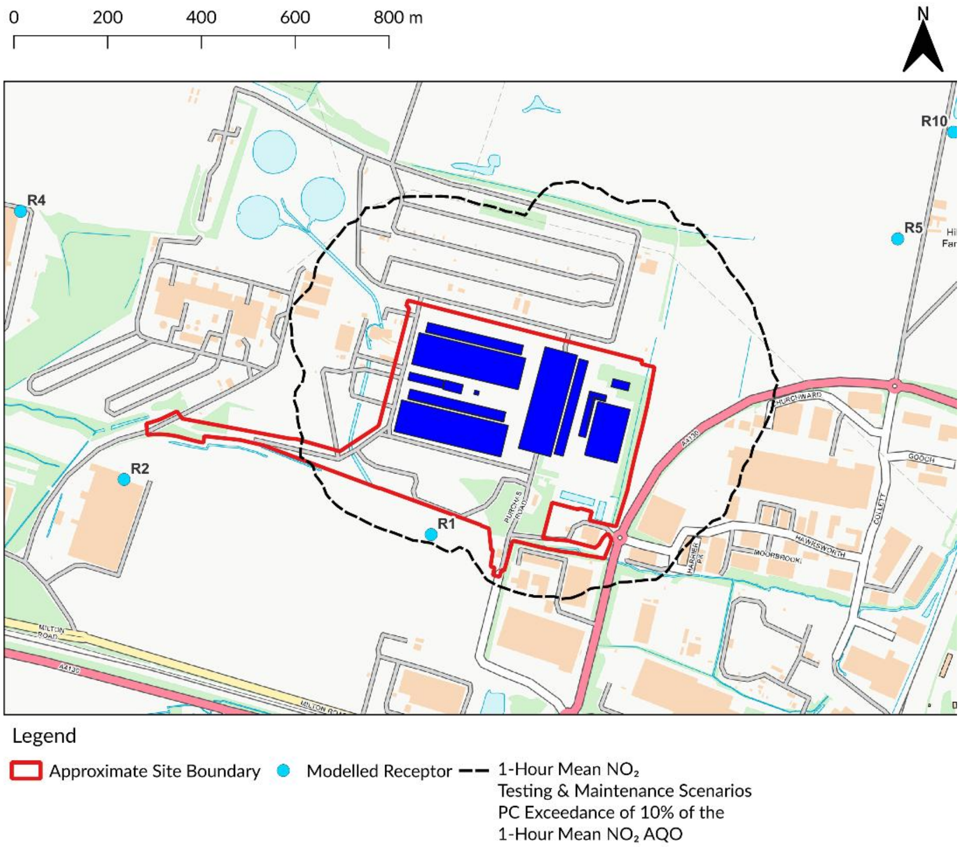

Figure 7: Extent of the 5% risk of PC exceedance of the 1-hour mean NO_2 AQO within the combined testing and maintenance scenarios. Contains OS Data © Crown Copyright and Database rights 2024.

Step 2 of the screening process for 1-hour mean impacts are displayed in Table 26.

Table 26: Step 2 of screening for NO_2 1-hour mean concentrations from the combined testing and maintenance scenarios on human health.

Receptor ID	PC (µg/m³)	1-hour mean AQO minus twice the long-term background (µg/m³)	PC as a % of the 1-hour mean AQO minus twice the long-term background	PEC (µg/m³)	Significance
R1	21.55	182.89	11.78	38.66	Insignificant
Note: The background NO_2 concentration utilised within this calculation is 8.55 as stated in Table 8.					

The 5% risk PC as a percentage of the 1-hour mean NO_2 AQO minus twice the long-term background is less than 20% at the one receptor that exceeded stage 1 of the screening criteria. As such, the impact of the combined testing and maintenance scenarios on the 1-hour mean NO_2 can be considered insignificant at all receptors.

6.1.2 PM_{10}.

Annual mean and 24-hour mean PC of PM_{10} have been assessed against the annual mean and 24-hour mean objective of 40 µg/m^3 and 50 µg/m^3 respectively at existing receptors. The 5% risk of there being an exceedance of the 1-hour mean has been calculated using the percentiles presented in section 4.7.1.

6.1.2.1 Annual Mean

The annual mean PC are shown in Table 27.

Table 27: Step 1 screening of PM_{10} annual mean concentrations from the combined testing and maintenance scenarios on human health.

Receptor ID	PC (µg/m^3)	PC as a % of Relevant AQO	Significance
R1	0.03	0.08	Insignificant
R2	<0.01	0.01	Insignificant
R3	0.01	0.03	Insignificant
R4	<0.01	0.01	Insignificant
R5	0.02	0.04	Insignificant
R6	0.01	0.03	Insignificant
R7	0.01	0.03	Insignificant
R8	<0.01	0.01	Insignificant
R9	0.01	0.02	Insignificant
R10	0.01	0.03	Insignificant
R11	0.02	0.04	Insignificant
R12	0.01	0.01	Insignificant
R13	<0.01	0.01	Insignificant
R14	<0.01	0.01	Insignificant
R15	0.01	0.02	Insignificant
R16	<0.01	0.01	Insignificant
R17	0.01	0.02	Insignificant
R18	0.01	0.03	Insignificant
R19	<0.01	0.01	Insignificant
R20	0.01	0.03	Insignificant
R21	<0.01	0.01	Insignificant
R22	0.01	0.02	Insignificant

In line with step 1 of the screening process, there are no receptors where the PC exceeds 1% of the relevant criteria. Therefore, all receptors can be screened out under step 1. The impact at existing receptors can be screened out as being insignificant.

6.1.2.2 24-hour mean.

The results for a 5% risk of exceedance of the 24-hour mean are shown in Table 28 for step 1 of the screening process.

Table 28: Step 1 of screening for 5% risk of there being an exceedance of the PM_{10} 24-hour mean from the combined testing and maintenance scenarios on human health.

Receptor ID	PC (µg/m^3)	PC as a % of Relevant AQO	Significance
R1	<0.01	<0.01	Insignificant
R2	<0.01	<0.01	Insignificant
R3	<0.01	<0.01	Insignificant
R4	<0.01	<0.01	Insignificant
R5	<0.01	<0.01	Insignificant
R6	<0.01	<0.01	Insignificant
R7	<0.01	<0.01	Insignificant
R8	<0.01	<0.01	Insignificant
R9	<0.01	<0.01	Insignificant
R10	<0.01	<0.01	Insignificant
R11	<0.01	<0.01	Insignificant
R12	<0.01	<0.01	Insignificant
R13	<0.01	<0.01	Insignificant
R14	<0.01	<0.01	Insignificant
R15	<0.01	<0.01	Insignificant
R16	<0.01	<0.01	Insignificant
R17	<0.01	<0.01	Insignificant
R18	<0.01	<0.01	Insignificant
R19	<0.01	<0.01	Insignificant
R20	<0.01	<0.01	Insignificant
R21	<0.01	<0.01	Insignificant
R22	<0.01	<0.01	Insignificant

There are no receptors from step 1 of the screening process where the PC as a % of the relevant AQO exceeds 10%. The impacts at all receptors are likely to be insignificant.

6.1.3 SO_2.

24-hour mean, 1-hour mean and 15-minute mean PC of SO_2 have been assessed against the 24-hour mean, 1-hour mean and 15-minute objectives of 125 µg/m^3, 350 µg/m^3 and 266 µg/m^3 respectively at existing receptors. The 5% risk of there being an exceedance of the 24-hour mean, 1-hour mean, and 15-minute mean have been calculated using the percentiles presented in section 4.7.1.

6.1.3.1 24-hour mean.

The results for a 5% risk of exceedance of the 24-hour mean are shown in Table 29 for step 1 of the screening process.

Table 29: Step 1 of screening for 5% risk of there being an exceedance of the SO_2 24-hour mean from the combined testing and maintenance scenarios on human health.

Receptor ID	PC (µg/m^3)	PC as a % of Relevant AQO	Significance
R1	0.29	0.23	Insignificant
R2	0.04	0.03	Insignificant
R3	0.10	0.08	Insignificant
R4	0.04	0.03	Insignificant
R5	0.10	0.08	Insignificant
R6	0.08	0.07	Insignificant
R7	0.07	0.06	Insignificant
R8	0.03	0.03	Insignificant
R9	0.08	0.06	Insignificant
R10	0.07	0.06	Insignificant
R11	0.07	0.06	Insignificant
R12	0.05	0.04	Insignificant
R13	0.02	0.02	Insignificant
R14	0.03	0.02	Insignificant
R15	0.06	0.05	Insignificant
R16	0.02	0.02	Insignificant
R17	0.05	0.04	Insignificant
R18	0.07	0.06	Insignificant
R19	0.02	0.02	Insignificant
R20	0.06	0.04	Insignificant
R21	0.04	0.03	Insignificant
R22	0.05	0.04	Insignificant

There are no receptors from step 1 of the screening process where the PC as a % of the relevant AQO exceeds 10%. The impacts at all receptors are likely to be insignificant.

6.1.3.2 1-hour mean.

The results for a 5% risk of exceedance of the 1-hour mean are shown in Table 30 for step 1 of the screening process.

Table 30: Step 1 of screening for 5% risk of there being an exceedance of the SO_2 1-hour mean from the combined testing and maintenance scenarios on human health.

Receptor ID	PC (µg/m^3)	PC as a % of Relevant AQO	Significance
R1	0.54	0.15	Insignificant
R2	0.11	0.03	Insignificant
R3	0.25	0.07	Insignificant
R4	0.09	0.03	Insignificant
R5	0.19	0.05	Insignificant
R6	0.17	0.05	Insignificant
R7	0.15	0.04	Insignificant
R8	0.08	0.02	Insignificant
R9	0.16	0.04	Insignificant
R10	0.14	0.04	Insignificant
R11	0.15	0.04	Insignificant
R12	0.12	0.03	Insignificant
R13	0.06	0.02	Insignificant
R14	0.06	0.02	Insignificant
R15	0.13	0.04	Insignificant
R16	0.05	0.02	Insignificant
R17	0.11	0.03	Insignificant
R18	0.16	0.05	Insignificant
R19	0.06	0.02	Insignificant
R20	0.12	0.03	Insignificant
R21	0.11	0.03	Insignificant
R22	0.12	0.04	Insignificant

There are no receptors from step 1 of the screening process where the PC as a % of the relevant AQO exceeds 10%. The impact at existing receptors can be screened out as being insignificant.

6.1.3.3 15-minute mean.

The results for a 5% risk of exceedance of the 15-minute mean are shown in Table 31 for step 1 of the screening process.

Table 31: Step 1 of screening for 5% risk of there being an exceedance of the SO_2 15-minute mean from the combined testing and maintenance scenarios on human health.

Receptor ID	PC (µg/m^3)	PC as a % of Relevant AQO	Significance
R1	0.76	0.29	Insignificant
R2	0.22	0.08	Insignificant
R3	0.46	0.17	Insignificant
R4	0.16	0.06	Insignificant
R5	0.29	0.11	Insignificant
R6	0.27	0.10	Insignificant
R7	0.24	0.09	Insignificant
R8	0.15	0.06	Insignificant
R9	0.26	0.10	Insignificant
R10	0.25	0.09	Insignificant
R11	0.24	0.09	Insignificant
R12	0.21	0.08	Insignificant
R13	0.14	0.05	Insignificant
R14	0.14	0.05	Insignificant
R15	0.22	0.08	Insignificant
R16	0.14	0.05	Insignificant
R17	0.19	0.07	Insignificant
R18	0.27	0.10	Insignificant
R19	0.13	0.05	Insignificant
R20	0.23	0.09	Insignificant
R21	0.20	0.07	Insignificant
R22	0.21	0.08	Insignificant

There are no receptors from step 1 of the screening process where the PC as a % of the relevant AQO exceeds 10%. The impact at existing receptors can be screened out as being insignificant.

6.1.4 CO.

8-hour mean and 1-hour mean PC of CO have been assessed against the 8-hour mean and 1-hour mean objective of 10,000 µg/m^3 and 30,000 µg/m^3 respectively at receptors. The 5% risk of there being an exceedance of the 8-hour mean and 1-hour mean has been calculated using the percentiles presented in section 4.7.1..

6.1.4.1 8-hour mean.

The results for a 5% risk of exceedance of the 8-hour mean are shown in Table 32 for step 1 of the screening process.

Table 32: Step 1 of screening for 5% risk of there being an exceedance of the CO 8-hour mean from the combined testing and maintenance scenarios on human health.

Receptor ID	PC (µg/m^3)	PC as a % of Relevant AQO	Significance
R1	9.29	0.09	Insignificant
R2	3.73	0.04	Insignificant
R3	5.99	0.06	Insignificant
R4	2.84	0.03	Insignificant
R5	4.70	0.05	Insignificant
R6	4.50	0.04	Insignificant
R7	4.41	0.04	Insignificant
R8	2.86	0.03	Insignificant
R9	4.20	0.04	Insignificant
R10	5.03	0.05	Insignificant
R11	4.00	0.04	Insignificant
R12	4.93	0.05	Insignificant
R13	2.41	0.02	Insignificant
R14	2.61	0.03	Insignificant
R15	4.77	0.05	Insignificant
R16	2.91	0.03	Insignificant
R17	3.91	0.04	Insignificant
R18	4.31	0.04	Insignificant
R19	2.51	0.03	Insignificant
R20	4.27	0.04	Insignificant
R21	3.76	0.04	Insignificant
R22	3.06	0.03	Insignificant

There are no receptors from step 1 of the screening process where the PC as a % of the relevant AQO exceeds 10%. The impact at existing receptors can be screened out as being insignificant.

6.1.4.2 1-hour mean.

The results for a 5% risk of exceedance of the 1-hour mean are shown in Table 33 for step 1 of the screening process.

Table 33: Step 1 of screening for 5% risk of there being an exceedance of the CO 1-hour mean from the combined testing and maintenance scenarios on human health.

Receptor ID	PC (µg/m^3)	PC as a % of Relevant AQO	Significance
R1	13.28	0.04	Insignificant
R2	5.33	0.02	Insignificant
R3	8.55	0.03	Insignificant
R4	4.06	0.01	Insignificant
R5	6.72	0.02	Insignificant
R6	6.43	0.02	Insignificant
R7	6.30	0.02	Insignificant
R8	4.08	0.01	Insignificant
R9	6.00	0.02	Insignificant
R10	7.19	0.02	Insignificant
R11	5.71	0.02	Insignificant
R12	7.05	0.02	Insignificant
R13	3.44	0.01	Insignificant
R14	3.73	0.01	Insignificant
R15	6.81	0.02	Insignificant
R16	4.16	0.01	Insignificant
R17	5.58	0.02	Insignificant
R18	6.15	0.02	Insignificant
R19	3.58	0.01	Insignificant
R20	6.10	0.02	Insignificant
R21	5.36	0.02	Insignificant
R22	4.37	0.01	Insignificant

There are no receptors from step 1 of the screening process where the PC as a % of the relevant AQO exceeds 10%. The impact at existing receptors can be screened out as being insignificant.

6.1.5 Benzene.

Annual mean and 1-hour mean PC of benzene have been assessed against the annual mean and 1-hour mean objective of 5 µg/m^3 and 195 µg/m^3 respectively at existing receptors. The 5% risk of there being an exceedance of the 1-hour mean has been calculated using the percentiles presented in section 4.7.1.

6.1.5.1 Annual Mean

The annual mean PC are shown in Table 34.

Table 34: Step 1 screening of benzene annual mean concentrations from the combined testing and maintenance scenarios on human health.

Receptor ID	PC (µg/m^3)	PC as a % of Relevant AQO	Significance
R1	0.08	1.68	Potentially significant
R2	0.01	0.22	Insignificant
R3	0.03	0.54	Insignificant
R4	0.01	0.21	Insignificant
R5	0.04	0.87	Insignificant
R6	0.03	0.55	Insignificant
R7	0.03	0.60	Insignificant
R8	0.01	0.17	Insignificant
R9	0.02	0.46	Insignificant
R10	0.03	0.68	Insignificant
R11	0.04	0.75	Insignificant
R12	0.01	0.25	Insignificant
R13	0.01	0.14	Insignificant
R14	0.01	0.14	Insignificant
R15	0.02	0.33	Insignificant
R16	0.01	0.15	Insignificant
R17	0.02	0.39	Insignificant
R18	0.03	0.69	Insignificant
R19	0.01	0.12	Insignificant
R20	0.03	0.52	Insignificant
R21	0.01	0.19	Insignificant
R22	0.02	0.33	Insignificant

In line with step 1 of the screening process, there is one receptor where the PC exceeds 1% of the relevant criteria and therefore cannot be screened out under step 1. The impacts at the remaining receptors are likely to be insignificant.

There is a receptor located within the area exceeding 1% of the annual mean benzene AQO. Step 2 of the screening process for annual mean impacts are displayed in Table 35.

Table 35: Step 2 of screening for benzene annual mean concentrations from the combined testing and maintenance scenarios on human health.

Receptor ID	PEC (µg/m^3)	PEC as a % of Relevant AQO	Significance
R1	0.29	5.80	Insignificant

In line with step 2 of the screening process, there are no receptors where the PEC exceeds 70% of the annual mean benzene criteria. As such, the impact of the combined testing and maintenance scenarios on the annual mean benzene can be considered insignificant at all existing sensitive receptors.

6.1.5.2 1-hour mean.

The results for a 5% risk of exceedance of the 1-hour mean are shown in Table 36 for step 1 of the screening process.

Table 36: Step 1 of screening for 5% risk of there being an exceedance of the benzene 1-hour mean from the combined testing and maintenance scenarios on human health.

Receptor ID	PC (µg/m^3)	PC as a % of Relevant AQO	Significance
R1	6.28	3.22	Insignificant
R2	3.14	1.61	Insignificant
R3	3.60	1.84	Insignificant
R4	1.86	0.95	Insignificant
R5	3.14	1.61	Insignificant
R6	2.84	1.45	Insignificant
R7	2.56	1.31	Insignificant
R8	2.25	1.15	Insignificant
R9	3.12	1.60	Insignificant
R10	3.24	1.66	Insignificant
R11	2.56	1.32	Insignificant
R12	3.04	1.56	Insignificant
R13	2.49	1.28	Insignificant
R14	2.19	1.12	Insignificant
R15	2.91	1.49	Insignificant
R16	2.52	1.29	Insignificant
R17	2.43	1.25	Insignificant
R18	2.71	1.39	Insignificant
R19	2.11	1.08	Insignificant
R20	2.98	1.53	Insignificant
R21	3.00	1.54	Insignificant
R22	2.37	1.22	Insignificant

There are no receptors from step 1 of the screening process where the PC as a % of the relevant AQO exceeds 10%. The impacts at all receptors are likely to be insignificant.

6.2 Outage scenario.

The following outlines the results of the dispersion modelling for the 72-hour outage scenario. This scenario considers all generators running simultaneously for 72-hours.

To represent the worst-case meteorological conditions, the maximum concentration from the three modelled years (2022, 2023, 2024) has been presented for each receptor location.

6.2.1 NO_2.

Annual mean and 1-hour mean PC of NO_2 have been assessed against the annual mean and 1-hour mean objective of 40 µg/m^3 and 200 µg/m^3 respectively at existing receptors. The 5% risk of there being an exceedance of the 1-hour mean has been calculated using the percentiles presented in section 4.7.1.

6.2.1.1 Annual Mean

The annual mean PC are shown in Table 37.

Table 37: Step 1 screening of NO_2 annual mean concentrations from the outage scenario on human health.

Receptor ID	PC (µg/m^3)	PC as a % of Relevant AQO	Significance
R1	1.80	4.51	Potentially significant
R2	0.30	0.76	Insignificant
R3	0.66	1.64	Potentially significant
R4	0.31	0.78	Insignificant
R5	1.00	2.50	Potentially significant
R6	0.71	1.77	Potentially significant
R7	0.83	2.08	Potentially significant
R8	0.28	0.69	Insignificant
R9	0.55	1.37	Potentially significant
R10	0.85	2.13	Potentially significant
R11	1.08	2.70	Potentially significant
R12	0.36	0.90	Insignificant
R13	0.22	0.55	Insignificant
R14	0.22	0.56	Insignificant
R15	0.45	1.14	Potentially significant
R16	0.24	0.60	Insignificant
R17	0.58	1.44	Potentially significant
R18	1.10	2.74	Potentially significant
R19	0.21	0.52	Insignificant
R20	0.72	1.79	Potentially significant
R21	0.29	0.72	Insignificant
R22	0.44	1.11	Potentially significant
R25	0.84	1.47	Potentially significant
R32	0.62	1.09	Potentially significant
R33	0.75	1.31	Potentially significant
R35	0.73	1.28	Potentially significant

Receptor ID	PC (µg/m³)	PC as a % of Relevant AQO	Significance
R37	0.91	1.59	Potentially significant
R42	0.82	1.43	Potentially significant
R46	0.59	1.03	Potentially significant

In line with step 1 of the screening process, there are 20 receptors where the PC exceeds 1% of the relevant criteria, and therefore they cannot be screened out under step 1. The extent of the exceedance is shown Figure 8. The impact at existing receptors can be screened out as being insignificant.

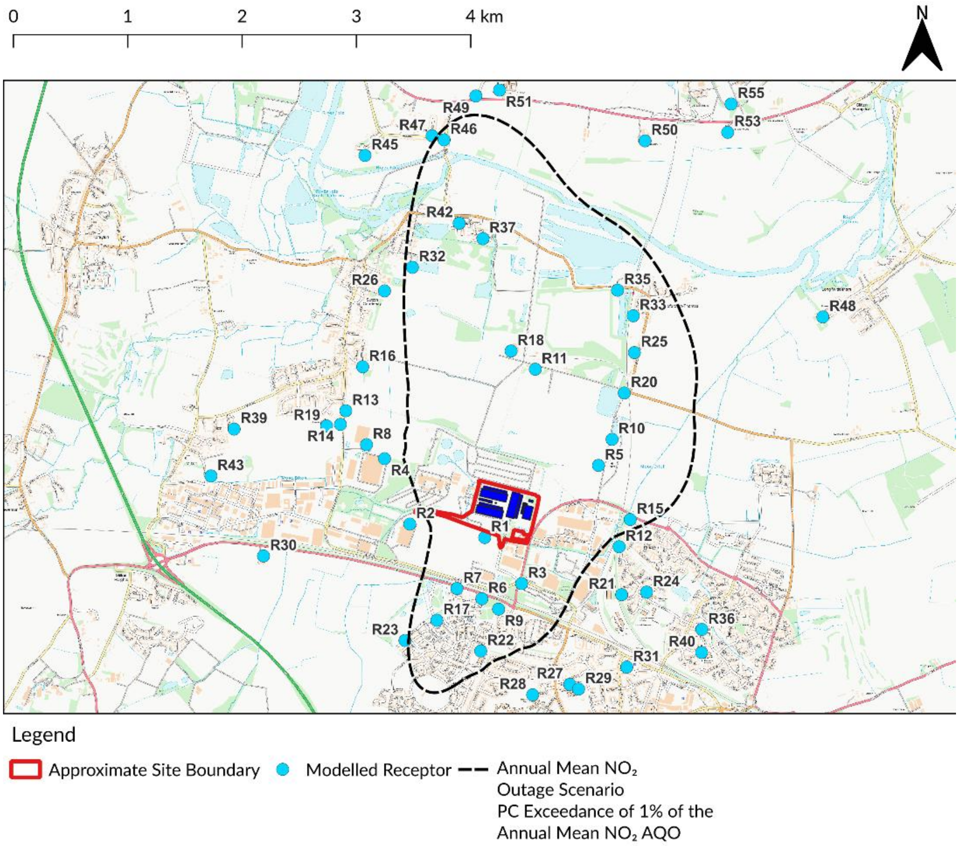

Figure 8: Extent of the PC exceedance of the annual mean NO_2 AQO within the outage scenario. Contains OS Data © Crown Copyright and Database rights 2024.

There are existing sensitive receptors located within the area exceeding 1% of the annual mean NO_2 AQO as outlined in Figure 8.

Step 2 of the screening process for annual mean impacts are displayed in Table 38.

Table 38: Step 2 of screening for NO_2 annual mean concentrations from the combined outage scenario on human health.

Receptor ID	PEC (µg/m³)	PEC as a % of Relevant AQO	Significance
R1	10.36	25.89	Insignificant
R3	9.21	23.02	Insignificant
R5	8.79	21.98	Insignificant

Receptor ID	PEC (µg/m^3)	PEC as a % of Relevant AQO	Significance
R6	9.26	23.16	Insignificant
R7	9.14	22.85	Insignificant
R9	8.73	21.82	Insignificant
R10	8.65	21.62	Insignificant
R11	8.87	22.17	Insignificant
R15	8.79	21.98	Insignificant
R17	7.93	19.82	Insignificant
R18	8.88	22.21	Insignificant
R20	8.51	21.28	Insignificant
R22	8.62	21.55	Insignificant
R25	8.42	21.06	Insignificant
R32	8.35	20.86	Insignificant
R33	8.36	20.90	Insignificant
R35	8.35	20.87	Insignificant
R37	9.88	24.70	Insignificant
R42	8.96	22.39	Insignificant
R46	8.47	21.16	Insignificant

In line with step 2 of the screening process, there are no receptors where the PEC exceeds 70% of the annual mean NO_2 criteria. The impact at existing receptors can be screened out as being insignificant.

6.2.1.2 1-hour mean.

The results for a 5% risk of exceedance of the 1-hour mean are shown in Table 39 for step 1 of the screening process.

Table 39: Step 1 of screening for 5% risk of there being an exceedance of the NO_2 1-hour mean from the outage scenario on human health.

Receptor ID	PC (µg/m^3)	PC as a % of Relevant AQO	Significance
R1	33.36	16.68	Potentially significant
R2	<0.01	<0.01	Insignificant
R3	1.74	0.87	Insignificant
R4	<0.01	<0.01	Insignificant
R5	37.79	18.89	Potentially significant
R6	4.82	2.41	Insignificant
R7	0.67	0.33	Insignificant
R8	<0.01	<0.01	Insignificant
R9	3.25	1.63	Insignificant

Receptor ID	PC (µg/m^3)	PC as a % of Relevant AQO	Significance
R10	49.64	24.82	Potentially significant
R11	153.71	76.85	Potentially significant
R12	<0.01	<0.01	Insignificant
R13	<0.01	<0.01	Insignificant
R14	<0.01	<0.01	Insignificant
R15	0.12	0.06	Insignificant
R16	0.01	0.01	Insignificant
R17	0.05	0.03	Insignificant
R18	153.19	76.60	Potentially significant
R19	<0.01	<0.01	Insignificant
R20	53.80	26.90	Potentially significant
R21	<0.01	<0.01	Insignificant
R22	0.70	0.35	Insignificant
R33	43.16	21.58	Potentially significant
R35	49.25	24.63	Potentially significant
R37	58.53	29.26	Potentially significant
R42	38.40	19.20	Potentially significant
R46	22.77	11.39	Potentially significant
R47	26.95	13.48	Potentially significant
R49	27.09	13.55	Potentially significant
R51	33.64	16.82	Potentially significant

There are 15 receptors from step 1 of the screening process where the PC as a % of the relevant AQO exceeds 10% and as such, impacts may be potentially significant, the extent of which is displayed in Figure 9. The impact at existing receptors can be screened out as being insignificant.

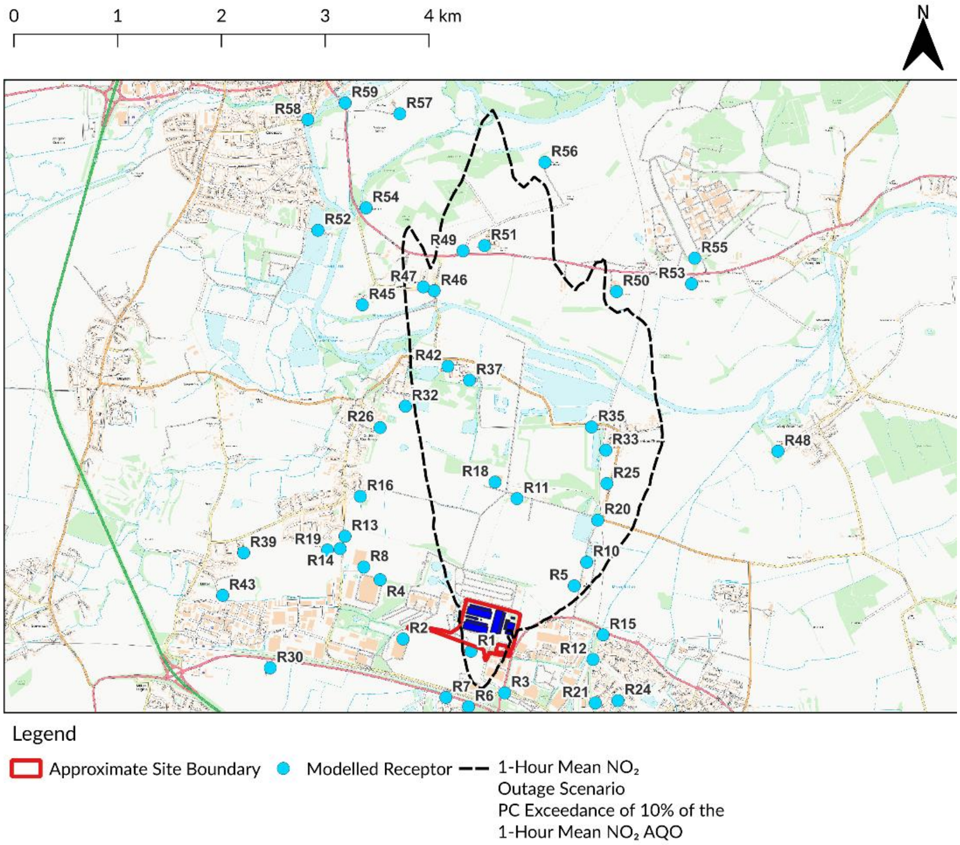

Figure 9: Extent of the 5% risk of PC exceedance of the 1-hour mean NO_2 AQO within the outage scenario. Contains OS Data © Crown Copyright and Database rights 2024.

Step 2 of the screening process for 1-hour mean impacts are displayed in Table 40.

Table 40: Step 2 of screening for NO_2 1-hour mean concentrations from the outage scenario on human health.

Receptor ID	PC (µg/m³)	1-hour mean AQO minus twice the long-term background (µg/m³)	PC as a % of the 1-hour mean AQO minus twice the long-term background	PEC (µg/m³)	Significance
R1	33.36	182.89	18.24	50.46	Insignificant
R5	37.79	184.41	20.49	53.38	Potentially significant
R10	49.64	184.41	26.92	65.23	Potentially significant
R11	153.71	184.42	83.34	169.28	Potentially significant
R18	153.19	184.42	83.07	168.77	Potentially significant
R20	53.80	184.41	29.17	69.39	Potentially significant
R25	47.03	184.33	25.52	62.70	Potentially significant
R33	43.16	184.33	23.41	58.83	Potentially significant
R35	49.25	184.33	26.72	64.93	Potentially significant
R37	58.53	181.51	32.24	77.01	Potentially significant

Receptor ID	PC ($\mu g/m^3$)	1-hour mean AQO minus twice the long-term background ($\mu g/m^3$)	PC as a % of the 1-hour mean AQO minus twice the long-term background	PEC ($\mu g/m^3$)	Significance
R42	38.40	183.23	20.95	55.16	Potentially significant
R46	22.77	183.89	12.38	38.88	Insignificant
R47	26.95	183.89	14.66	43.06	Insignificant
R49	27.09	184.14	14.71	42.95	Insignificant
R51	33.64	184.14	18.27	49.50	Insignificant

The 5% risk PC as a percentage of the 1-hour mean NO_2 AQO minus twice the long-term background is less than 20% at the five receptors that exceeded stage 1 of the screening criteria. However, it is exceeded at 10 receptors. The 5% risk PEC at all modelled receptors is less than 200 $\mu g/m^3$, indicating that an exceedance of the 1-hour mean NO_2 AQO is considered to be unlikely. There is a minimum headroom of 30.72 $\mu g/m^3$ before an exceedance of the 1-hour mean NO_2 AQO is predicted, equivalent to 15.36% of the AQO.

Furthermore, due to the Site having two substations, the likelihood of a 72-hour outage occurring simultaneously at both is considered highly unlikely. This scenario has been considered with a number of worst-case assumptions, when in reality impacts are anticipated to be smaller.

As such, the impact of the outage scenarios on the 1-hour mean NO_2 can be considered not significant at all receptors.

6.2.2 PM_{10}.

The annual mean PC of PM_{10} has been assessed against the annual mean objective of 40 $\mu g/m^3$ at existing receptors.

Due to the 72-hour duration of the outage scenario, it is not possible for the 24-hour mean PM_{10} objective to be exceeded 35 times. As such, it has not been presented for this scenario.

6.2.2.1 Annual Mean

The annual mean PC are shown in Table 41.

Table 41: Step 1 screening of PM_{10} annual mean concentrations from the outage scenario on human health.

Receptor ID	PC ($\mu g/m^3$)	PC as a % of Relevant AQO	Significance
R1	0.06	0.16	Insignificant
R2	0.01	0.03	Insignificant
R3	0.02	0.06	Insignificant
R4	0.01	0.03	Insignificant
R5	0.04	0.09	Insignificant
R6	0.03	0.06	Insignificant
R7	0.03	0.07	Insignificant
R8	0.01	0.02	Insignificant
R9	0.02	0.05	Insignificant

Receptor ID	PC (µg/m^3)	PC as a % of Relevant AQO	Significance
R10	0.03	0.08	Insignificant
R11	0.04	0.10	Insignificant
R12	0.01	0.03	Insignificant
R13	0.01	0.02	Insignificant
R14	0.01	0.02	Insignificant
R15	0.02	0.04	Insignificant
R16	0.01	0.02	Insignificant
R17	0.02	0.05	Insignificant
R18	0.04	0.10	Insignificant
R19	0.01	0.02	Insignificant
R20	0.03	0.06	Insignificant
R21	0.01	0.03	Insignificant
R22	0.02	0.04	Insignificant

In line with step 1 of the screening process, there are no receptors where the PC exceeds 1% of the relevant criteria. Therefore, all receptors can be screened out under step 1. The impact at existing receptors can be screened out as being insignificant.

6.2.3 SO_2.

1-hour mean and 15-minute mean PC of SO_2 have been assessed against the 1-hour mean and 15-minute objectives of 350 µg/m^3 and 266 µg/m^3 respectively at existing receptors. The 5% risk of there being an exceedance of the 1-hour mean and 15-minute mean have been calculated using the percentiles presented in section 4.7.1. Due to the 72-hour duration of the outage scenario, it is not possible for the 24-hour mean SO_2 objective to be exceeded 3 times. As such, it has not been presented for this scenario.

6.2.3.1 1-hour mean.

The results for a 5% risk of exceedance of the 1-hour mean are shown in Table 42 for step 1 of the screening process.

Table 42: Step 1 of screening for 5% risk of there being an exceedance of the SO_2 1-hour mean from the outage scenario on human health.

Receptor ID	PC (µg/m^3)	PC as a % of Relevant AQO	Significance
R1	<0.01	<0.01	Insignificant
R2	<0.01	<0.01	Insignificant
R3	<0.01	<0.01	Insignificant
R4	<0.01	<0.01	Insignificant
R5	0.01	<0.01	Insignificant
R6	<0.01	<0.01	Insignificant
R7	<0.01	<0.01	Insignificant
R8	<0.01	<0.01	Insignificant

Receptor ID	PC (µg/m^3)	PC as a % of Relevant AQO	Significance
R9	<0.01	<0.01	Insignificant
R10	0.03	0.01	Insignificant
R11	0.36	0.10	Insignificant
R12	<0.01	<0.01	Insignificant
R13	<0.01	<0.01	Insignificant
R14	<0.01	<0.01	Insignificant
R15	<0.01	<0.01	Insignificant
R16	<0.01	<0.01	Insignificant
R17	<0.01	<0.01	Insignificant
R18	0.32	0.09	Insignificant
R19	<0.01	<0.01	Insignificant
R20	0.04	0.01	Insignificant
R21	<0.01	<0.01	Insignificant
R22	<0.01	<0.01	Insignificant

There are no receptors from step 1 of the screening process where the PC as a % of the relevant AQO exceeds 10%. The impacts at all receptors are likely to be insignificant.

6.2.3.2 15-minute mean.

The results for a 5% risk of exceedance of the 15-minute mean are shown in Table 43 for step 1 of the screening process.

Table 43: Step 1 of screening for 5% risk of there being an exceedance of the SO_2 15-minute mean from the outage scenario on human health.

Receptor ID	PC (µg/m^3)	PC as a % of Relevant AQO	Significance
R1	3.42	1.29	Insignificant
R2	<0.01	<0.01	Insignificant
R3	0.55	0.21	Insignificant
R4	0.01	<0.01	Insignificant
R5	1.62	0.61	Insignificant
R6	1.12	0.42	Insignificant
R7	1.34	0.50	Insignificant
R8	0.01	<0.01	Insignificant
R9	0.73	0.27	Insignificant
R10	1.32	0.50	Insignificant
R11	1.36	0.51	Insignificant
R12	0.09	0.03	Insignificant

Receptor ID	PC (µg/m^3)	PC as a % of Relevant AQO	Significance
R13	0.01	0.01	Insignificant
R14	0.01	<0.01	Insignificant
R15	0.28	0.11	Insignificant
R16	0.05	0.02	Insignificant
R17	0.89	0.34	Insignificant
R18	1.41	0.53	Insignificant
R19	<0.01	<0.01	Insignificant
R20	0.94	0.36	Insignificant
R21	0.04	0.01	Insignificant
R22	0.54	0.20	Insignificant

There are no receptors from step 1 of the screening process where the PC as a % of the relevant AQO exceeds 10%. The impacts at all receptors are likely to be insignificant.

6.2.4 CO.

8-hour mean and 1-hour mean PC of CO have been assessed against the 8-hour mean and 1-hour mean objective of 10,000 µg/m^3 and 30,000 µg/m^3 respectively at receptors. The 5% risk of there being an exceedance of the 8-hour mean and 1-hour mean has been calculated using the percentiles presented in section 4.7.1.

6.2.4.1 8-hour mean.

The results for a 5% risk of exceedance of the 8-hour mean are shown in Table 44 for step 1 of the screening process.

Table 44: Step 1 of screening for 5% risk of there being an exceedance of the CO 8-hour mean from the outage scenario on human health.

Receptor ID	PC (µg/m^3)	PC as a % of Relevant AQO	Significance
R1	221.06	0.74	Insignificant
R2	127.66	0.43	Insignificant
R3	143.21	0.48	Insignificant
R4	103.57	0.35	Insignificant
R5	144.86	0.48	Insignificant
R6	117.03	0.39	Insignificant
R7	123.94	0.41	Insignificant
R8	91.53	0.31	Insignificant
R9	110.35	0.37	Insignificant
R10	129.48	0.43	Insignificant
R11	105.27	0.35	Insignificant
R12	104.04	0.35	Insignificant

Receptor ID	PC (µg/m^3)	PC as a % of Relevant AQO	Significance
R13	77.57	0.26	Insignificant
R14	82.02	0.27	Insignificant
R15	115.01	0.38	Insignificant
R16	81.85	0.27	Insignificant
R17	99.76	0.33	Insignificant
R18	123.43	0.41	Insignificant
R19	77.52	0.26	Insignificant
R20	113.79	0.38	Insignificant
R21	100.29	0.33	Insignificant
R22	91.82	0.31	Insignificant

There are no receptors from step 1 of the screening process where the PC as a % of the relevant AQO exceeds 10%. The impacts at all receptors are likely to be insignificant.

6.2.4.2 1-hour mean.

The results for a 5% risk of exceedance of the 1-hour mean are shown in Table 45 for step 1 of the screening process.

Table 45: Step 1 of screening for 5% risk of there being an exceedance of the CO 1-hour mean from the outage scenarios on human health.

Receptor ID	PC (µg/m^3)	PC as a % of Relevant AQO	Significance
R1	329.46	3.29	Insignificant
R2	182.37	1.82	Insignificant
R3	206.97	2.07	Insignificant
R4	151.24	1.51	Insignificant
R5	208.08	2.08	Insignificant
R6	167.28	1.67	Insignificant
R7	191.89	1.92	Insignificant
R8	145.92	1.46	Insignificant
R9	157.64	1.58	Insignificant
R10	184.97	1.85	Insignificant
R11	164.88	1.65	Insignificant
R12	159.78	1.60	Insignificant
R13	131.88	1.32	Insignificant
R14	141.14	1.41	Insignificant
R15	171.76	1.72	Insignificant
R16	139.47	1.39	Insignificant

Receptor ID	PC (µg/m^3)	PC as a % of Relevant AQO	Significance
R17	150.04	1.50	Insignificant
R18	177.04	1.77	Insignificant
R19	133.91	1.34	Insignificant
R20	176.38	1.76	Insignificant
R21	149.82	1.50	Insignificant
R22	137.50	1.38	Insignificant

There are no receptors from step 1 of the screening process where the PC as a % of the relevant AQO exceeds 10%. The impact at existing receptors can be screened out as being insignificant.

6.2.5 Benzene.

Annual mean and 1-hour mean PC of benzene have been assessed against the annual mean and 1-hour mean objective of 5 µg/m^3 and 195 µg/m^3 respectively at existing receptors. The 5% risk of there being an exceedance of the 1-hour mean has been calculated using the percentiles presented in section 4.7.1.

6.2.5.1 Annual mean.

The annual mean PC are shown in Table 46.

Table 46: Step 1 screening of benzene annual mean concentrations from the outage scenario on human health.

Receptor ID	PC (µg/m^3)	PC as a % of Relevant AQO	Significance
R1	0.18	3.65	Potentially significant
R2	0.03	0.62	Insignificant
R3	0.07	1.33	Potentially significant
R4	0.03	0.64	Insignificant
R5	0.10	2.05	Potentially significant
R6	0.07	1.45	Potentially significant
R7	0.09	1.71	Potentially significant
R8	0.03	0.57	Insignificant
R9	0.06	1.12	Potentially significant
R10	0.09	1.75	Potentially significant
R11	0.11	2.21	Potentially significant
R12	0.04	0.74	Insignificant
R13	0.02	0.46	Insignificant
R14	0.02	0.46	Insignificant
R15	0.05	0.93	Insignificant
R16	0.02	0.49	Insignificant
R17	0.06	1.19	Potentially significant
R18	0.11	2.25	Insignificant

Receptor ID	PC (µg/m^3)	PC as a % of Relevant AQO	Significance
R19	0.02	0.43	Insignificant
R20	0.07	1.47	Potentially significant
R21	0.03	0.59	Insignificant
R22	0.05	0.91	Insignificant
R25	0.06	1.21	Potentially significant
R33	0.05	1.08	Potentially significant
R35	0.05	1.06	Potentially significant
R37	0.07	1.32	Potentially significant
R42	0.06	1.18	Potentially significant

In line with step 1 of the screening process, there are 16 receptors where the PC exceeds 1% of the relevant criteria and therefore cannot be screened out under step 1. The impact at existing receptors can be screened out as being insignificant.

Step 2 of the screening process for annual mean impacts are displayed in Table 47.

Table 47: Step 2 of screening for benzene annual mean concentrations from the outage scenario on human health.

Receptor ID	PEC (µg/m^3)	PEC as a % of Relevant AQO	Significance
R1	0.39	7.77	Insignificant
R3	0.27	5.45	Insignificant
R5	0.33	6.59	Insignificant
R6	0.28	5.57	Insignificant
R7	0.29	5.77	Insignificant
R9	0.23	4.68	Insignificant
R10	0.31	6.29	Insignificant
R11	0.35	7.05	Insignificant
R17	0.26	5.25	Insignificant
R18	0.35	7.09	Insignificant
R20	0.30	6.01	Insignificant
R25	0.29	5.85	Insignificant
R33	0.29	5.72	Insignificant
R35	0.28	5.70	Insignificant
R37	0.27	5.34	Insignificant
R42	0.21	4.24	Insignificant

In line with step 2 of the screening process, there are no receptors where the PEC exceeds 70% of the annual mean benzene criteria. As such, the impact of the combined testing and maintenance scenarios on the annual mean benzene can be considered insignificant at all existing sensitive receptors.

6.2.5.2 1-hour mean.

The results for a 5% risk of exceedance of the 1-hour mean are shown in Table 48 for step 1 of the screening process.

Table 48: Step 1 of screening for 5% risk of there being an exceedance of the benzene 1-hour mean from the outage scenario on human health.

Receptor ID	PC ($\mu g/m^3$)	PC as a % of Relevant AQO	Significance
R1	247.38	126.86	Potentially significant
R2	137.35	70.43	Potentially significant
R3	151.49	77.69	Potentially significant
R4	110.83	56.84	Potentially significant
R5	153.03	78.47	Potentially significant
R6	123.77	63.47	Potentially significant
R7	142.65	73.15	Potentially significant
R8	107.98	55.37	Potentially significant
R9	114.76	58.85	Potentially significant
R10	137.48	70.50	Potentially significant
R11	123.15	63.15	Potentially significant
R12	116.71	59.85	Potentially significant
R13	96.53	49.50	Potentially significant
R14	104.68	53.68	Potentially significant
R15	126.00	64.62	Potentially significant
R16	103.14	52.89	Potentially significant
R17	111.68	57.27	Potentially significant
R18	130.05	66.69	Potentially significant
R19	99.16	50.85	Potentially significant
R20	130.20	66.77	Potentially significant
R21	110.20	56.51	Potentially significant
R22	101.16	51.87	Potentially significant
R23	99.96	51.26	Potentially significant
R24	107.48	55.12	Potentially significant
R25	112.17	57.52	Potentially significant
R26	100.70	51.64	Potentially significant
R27	109.30	56.05	Potentially significant
R28	107.88	55.32	Potentially significant

Receptor ID	PC (µg/m^3)	PC as a % of Relevant AQO	Significance
R29	106.73	54.73	Potentially significant
R30	79.57	40.80	Potentially significant
R31	109.31	56.06	Potentially significant
R32	114.56	58.75	Potentially significant
R33	101.71	52.16	Potentially significant
R34	93.08	47.73	Potentially significant
R35	97.22	49.86	Potentially significant
R36	102.15	52.39	Potentially significant
R37	112.26	57.57	Potentially significant
R38	94.34	48.38	Potentially significant
R39	66.86	34.29	Potentially significant
R40	89.30	45.79	Potentially significant
R41	92.52	47.45	Potentially significant
R42	112.48	57.68	Potentially significant
R43	67.59	34.66	Potentially significant
R44	89.90	46.10	Potentially significant
R45	77.99	39.99	Potentially significant
R46	88.57	45.42	Potentially significant
R47	88.72	45.50	Potentially significant
R48	64.24	32.94	Potentially significant
R49	74.10	38.00	Potentially significant
R50	72.74	37.30	Potentially significant
R51	71.40	36.62	Potentially significant
R52	61.74	31.66	Potentially significant
R53	65.39	33.54	Potentially significant
R54	63.92	32.78	Potentially significant
R55	59.09	30.30	Potentially significant
R56	57.88	29.68	Potentially significant
R57	57.32	29.40	Potentially significant
R58	49.92	25.60	Potentially significant
R59	52.59	26.97	Potentially significant
R60	47.44	24.33	Potentially significant
R61	49.83	25.55	Potentially significant

All 61 receptors from step 1 of the screening process where the PC as a % of the relevant AQO exceeds 10% and as such, impacts may be potentially significant.

Step 2 of the screening process for 1-hour mean impacts are displayed in Table 49.

Table 49: Step 2 of screening for benzene 1-hour mean concentrations from the outage scenario on human health.

Receptor ID	PC (µg/m^3)	1-hour mean AQO minus twice the long-term background (µg/m^3)	PC as a % of the 1-hour mean AQO minus twice the long-term background	PEC (µg/m^3)	Significance
R1	247.38	194.59	127.13	247.80	Potentially significant
R2	137.35	194.59	70.58	137.75	Potentially significant
R3	151.49	194.59	77.85	151.90	Potentially significant
R4	110.83	194.59	56.96	111.24	Potentially significant
R5	153.03	194.55	78.66	153.48	Potentially significant
R6	123.77	194.59	63.61	124.18	Potentially significant
R7	142.65	194.59	73.30	143.05	Potentially significant
R8	107.98	194.59	55.49	108.39	Potentially significant
R9	114.76	194.64	58.96	115.12	Potentially significant
R10	137.48	194.55	70.66	137.93	Potentially significant
R11	123.15	194.52	63.31	123.63	Potentially significant
R12	116.71	194.70	59.94	117.00	Potentially significant
R13	96.53	194.59	49.61	96.94	Potentially significant
R14	104.68	194.60	53.79	105.09	Potentially significant
R15	126.00	194.70	64.72	126.30	Potentially significant
R16	103.14	194.52	53.02	103.62	Potentially significant
R17	111.68	194.59	57.39	112.09	Potentially significant
R18	130.05	194.52	66.86	130.54	Potentially significant
R19	99.16	194.60	50.96	99.57	Potentially significant
R20	130.20	194.55	66.93	130.66	Potentially significant
R21	110.20	194.70	56.60	110.50	Potentially significant
R22	101.16	194.64	51.97	101.51	Potentially significant
R23	99.96	194.59	51.37	100.36	Potentially significant
R24	107.48	194.70	55.20	107.78	Potentially significant
R25	112.17	194.54	57.66	112.63	Potentially significant
R26	100.70	194.52	51.77	101.18	Potentially significant
R27	109.30	194.64	56.15	109.65	Potentially significant
R28	107.88	194.64	55.42	108.23	Potentially significant

Receptor ID	PC (µg/m^3)	1-hour mean AQO minus twice the long-term background (µg/m^3)	PC as a % of the 1-hour mean AQO minus twice the long-term background	PEC (µg/m^3)	Significance
R29	106.73	194.63	54.84	107.10	Potentially significant
R30	79.57	194.59	40.89	79.97	Potentially significant
R31	109.31	194.63	56.16	109.68	Potentially significant
R32	114.56	194.52	58.89	115.04	Potentially significant
R33	101.71	194.54	52.28	102.18	Potentially significant
R34	93.08	194.59	47.83	93.48	Potentially significant
R35	97.22	194.54	49.98	97.68	Potentially significant
R36	102.15	194.62	52.49	102.54	Potentially significant
R37	112.26	194.60	57.69	112.66	Potentially significant
R38	94.34	194.63	48.47	94.70	Potentially significant
R39	66.86	194.60	34.36	67.26	Potentially significant
R40	89.30	194.62	45.88	89.68	Potentially significant
R41	92.52	194.63	47.54	92.89	Potentially significant
R42	112.48	194.69	57.77	112.78	Potentially significant
R43	67.59	194.60	34.74	68.00	Potentially significant
R44	89.90	194.59	46.20	90.30	Potentially significant
R45	77.99	194.69	40.06	78.29	Potentially significant
R46	88.57	194.72	45.49	88.85	Potentially significant
R47	88.72	194.72	45.56	89.00	Potentially significant
R48	64.24	194.73	32.99	64.51	Potentially significant
R49	74.10	194.71	38.06	74.39	Potentially significant
R50	72.74	194.70	37.36	73.04	Potentially significant
R51	71.40	194.71	36.67	71.70	Potentially significant
R52	61.74	194.58	31.73	62.16	Potentially significant
R53	65.39	194.69	33.59	65.70	Potentially significant
R54	63.92	194.72	32.83	64.20	Potentially significant
R55	59.09	194.69	30.35	59.40	Potentially significant
R56	57.88	194.70	29.73	58.18	Potentially significant
R57	57.32	194.70	29.44	57.62	Potentially significant
R58	49.92	194.55	25.66	50.37	Potentially significant
R59	52.59	194.70	27.01	52.89	Potentially significant

Receptor ID	PC (µg/m^3)	1-hour mean AQO minus twice the long-term background (µg/m^3)	PC as a % of the 1-hour mean AQO minus twice the long-term background	PEC (µg/m^3)	Significance
R60	47.44	194.55	24.38	47.89	Potentially significant
R61	49.83	194.56	25.61	50.27	Potentially significant

The 5% risk PC as a percentage of the 1-hour mean benzene AQO minus twice the long-term background is greater than 20% at all 61 receptors that exceeded stage 1 of the screening criteria. There is an exceedance of the 1-hour mean benzene AQO at receptor R1. This indicates a greater than 5% risk of exceedance at this location.

However, due to the Site having two substations, the power supply for the Development is resilient to potential outages. Due to this, the potential of a 72-hour outage occurring simultaneously at both is considered highly unlikely as outlined in Section 3.2. In addition, benzene has been assumed to represent 100% of HC emissions from the backup plant. In reality, there will be a combination of other compounds within these emissions and benzene impacts will be a small percentage of the VOCs emitted during the operation of the backup plant.

There are no predicted exceedances of the 1-hour mean benzene AQO at any other modelled receptors.

As such, the impact of the outage scenarios on the 1-hour mean benzene objective can be considered not significant at all receptors.

6.3 Summary of human health assessment.

The impacts of the operation of the backup plant in the combined testing and maintenance scenarios were found to be insignificant following the EA screening steps for all relevant objectives.

The impacts of the backup generators in the 72-hour outage scenario were found to be potentially significant for the 1-hour mean NO_2 and 1-hour mean benzene objectives. All other objectives were found to have insignificant impacts at all modelled sensitive receptors.

As there are no predicted exceedances of the 1-hour mean NO_2 objective and only one exceedance of the 1-hour mean benzene objective at the 5% risk percentile. Benzene has been considered as 100% of the HC emissions when in reality it is anticipated to be less. Overall, the impact at existing receptors has been determined to be not significant.

Furthermore, due to the Site having two substations, the likelihood of a 72-hour outage occurring simultaneously at both is considered highly unlikely.

Subsequently, impacts on all relevant objectives at all receptors in all scenarios can be either screened out and insignificant in line with the EA screening steps, or determined to be not significant through professional judgement.

7. Ecological assessment.

The potential for air quality impacts on ecological sites from the operation of the Plant are assessed in this section.

7.1 Testing and maintenance scenarios.

The following outlines the results of the dispersion modelling for the testing and maintenance scenarios. This considers the three modelled testing and maintenance scenarios (scenarios 1-3) cumulatively for the annual mean assessment criteria and the period mean for the short-term criteria. The worst-case impact from each individually modelled generator at each receptor location has been presented in this section.

To represent the worst-case meteorological conditions, the maximum concentration from the three modelled years (2022, 2023, 2024) has been presented for each receptor location.

7.1.1 NO_x

The PC predicted in the combined testing and maintenance scenarios have been compared to the relevant annual mean critical levels for NO_x. In addition, the 24-hour mean NO_x PC has been compared against the 200 µg/m^3 criteria set out by the EA guidance.

7.1.1.1 Annual mean.

Predicted annual mean concentrations for the ecological receptors are presented in Table 50.

Table 50: Step 1 screening for NO_X annual mean from the combined testing and maintenance scenarios on ecological receptors.

Receptor ID	PC (µg/m^3)	PC % of Critical Level	Significance
Ancient Woodland	0.20	0.68	Insignificant
Appleton Lower Common SSSI	0.01	0.02	Insignificant
Ashridge Wood SSSI	0.01	0.04	Insignificant
Barrow Farm Fen SSSI	0.02	0.06	Insignificant
Brasenose Wood and Shotover Hill SSSI	0.02	0.07	Insignificant
Cothill Fen SAC	0.02	0.05	Insignificant
Cothill Fen SSSI	0.02	0.05	Insignificant
Culham Brake SSSI	0.12	0.39	Insignificant
Dry Sandford Pit SSSI	0.02	0.06	Insignificant
Frilford Heath Ponds and Fens	0.01	0.03	Insignificant
Holies Down SSSI	0.01	0.03	Insignificant
Hurst Hill SSSI	0.02	0.08	Insignificant
Iffley Meadows SSSI	0.03	0.11	Insignificant
Langley's Lane Meadow SSSI	<0.01	0.01	Insignificant
Lardon Chase SSSI	0.01	0.03	Insignificant
Lye Valley SSSI	0.02	0.07	Insignificant
Moulsford Downs SSSI	0.01	0.04	Insignificant
New Marston Meadows SSSI	0.02	0.08	Insignificant
Oxford Meadows SAC	0.02	0.08	Insignificant

Receptor ID	PC (µg/m^3)	PC % of Critical Level	Significance
Port Meadow with Wolvercote Common & Green SSSI	0.02	0.08	Insignificant
Streatley Warren SSSI	0.01	0.04	Insignificant
Warren Bank SSSI	0.01	0.03	Insignificant
Wytham Woods SSSI	0.02	0.07	Insignificant

In line with step 1 of the screening process, the annual mean PC is less than 100% at the Ancient Woodland and less than 1% at the SSSIs and SACs. Therefore, all receptors can be screened out under step 1 and impact can be considered insignificant.

7.1.1.2 24-hour mean.

The results for a 5% risk of exceedance of the 24-hour mean are shown in Table 51 for step 1 of the screening process.

Table 51: Step 1 screening for NO_X 24-hour mean from the combined testing and maintenance scenarios on ecological receptors.

Name	PC (µg/m^3)	PC % of Critical Level	Significance
Ancient Woodland	21.17	10.59	Insignificant
Appleton Lower Common SSSI	1.77	0.88	Insignificant
Ashridge Wood SSSI	1.82	0.91	Insignificant
Aston Upthorpe Downs SSSI	3.10	1.55	Insignificant
Barrow Farm Fen SSSI	3.97	1.99	Insignificant
Brasenose Wood and Shotover Hill SSSI	1.62	0.81	Insignificant
Cothill Fen SAC	2.61	1.31	Insignificant
Cothill Fen SSSI	2.61	1.31	Insignificant
Culham Brake SSSI	7.93	3.96	Insignificant
Cumnor SSSI	1.79	0.89	Insignificant
Dry Sandford Pit SSSI	2.78	1.39	Insignificant
Frilford Heath Ponds and Fens	2.87	1.44	Insignificant
Holies Down SSSI	1.56	0.78	Insignificant
Hurst Hill SSSI	1.70	0.85	Insignificant
Iffley Meadows SSSI	2.09	1.05	Insignificant
Lamb and Flag Quarry SSSI	1.34	0.67	Insignificant
Langley's Lane Meadow SSSI	1.34	0.67	Insignificant
Lardon Chase SSSI	1.70	0.85	Insignificant
Little Wittenham SAC	5.54	2.77	Insignificant
Little Wittenham SSSI	5.54	2.77	Insignificant
Littlemore Railway Cutting SSS	2.08	1.04	Insignificant
Lye Valley SSSI	1.56	0.78	Insignificant

Name	PC (µg/m^3)	PC % of Critical Level	Significance
Magdalen Grove SSSI	1.40	0.70	Insignificant
Moulsford Downs SSSI	2.05	1.02	Insignificant
New Marston Meadows SSSI	1.40	0.70	Insignificant
Oxford Meadows SAC	1.42	0.71	Insignificant
Port Meadow with Wolvercote Common & Green SSSI	1.42	0.71	Insignificant
Rock Edge SSSI	1.43	0.71	Insignificant
Streatley Warren SSSI	2.00	1.00	Insignificant
Sugworth SSSI	2.84	1.42	Insignificant
Warren Bank SSSI	1.39	0.70	Insignificant
Wytham Woods SSSI	1.49	0.75	Insignificant

In line with step 1 of the screening process, the 24-hour mean PC is less than 100% at the Ancient Woodland and less than 10% at the SSSIs and SACs. Therefore, all receptors can be screened out under step 1 and impact can be considered insignificant.

7.1.2 SO_2.

The PC predicted in the combined testing and maintenance scenarios have been compared to the relevant annual mean critical levels for SO_2.

7.1.2.1 Annual mean.

Predicted annual mean concentrations for the ecological receptors are presented in Table 52.

Table 52: Step 1 screening for SO_2 annual mean from the combined testing and maintenance scenarios on ecological receptors.

Name	PC (µg/m^3)	PC % of Critical Level	Significance
Ancient Woodland	<0.01	0.02	Insignificant
Appleton Lower Common SSSI	<0.01	<0.01	Insignificant
Ashridge Wood SSSI	<0.01	<0.01	Insignificant
Aston Upthorpe Downs SSSI	<0.01	<0.01	Insignificant
Barrow Farm Fen SSSI	<0.01	<0.01	Insignificant
Brasenose Wood and Shotover Hill SSSI	<0.01	<0.01	Insignificant
Cothill Fen SAC	<0.01	<0.01	Insignificant
Cothill Fen SSSI	<0.01	0.01	Insignificant
Culham Brake SSSI	<0.01	<0.01	Insignificant
Cumnor SSSI	<0.01	<0.01	Insignificant
Dry Sandford Pit SSSI	<0.01	<0.01	Insignificant
Frilford Heath, Ponds and Fens SSSI	<0.01	<0.01	Insignificant
Holies Down SSSI	<0.01	<0.01	Insignificant

Name	PC (µg/m3)	PC % of Critical Level	Significance
Hurst Hill SSSI	<0.01	<0.01	Insignificant
Iffley Meadows SSSI	<0.01	<0.01	Insignificant
Lamb and Flag Quarry SSSI	<0.01	<0.01	Insignificant
Langley's Lane Meadow SSSI	<0.01	<0.01	Insignificant
Lardon Chase SSSI	<0.01	<0.01	Insignificant
Little Wittenham SAC	<0.01	<0.01	Insignificant
Littlemore Railway Cutting SSSI	<0.01	<0.01	Insignificant
Lye Valley SSSI	<0.01	<0.01	Insignificant
Magdalen Grove SSSI	<0.01	<0.01	Insignificant
Moulsford Downs SSSI	<0.01	<0.01	Insignificant
New Marston Meadows SSSI	<0.01	0.02	Insignificant
Oxford Meadows SAC	<0.01	<0.01	Insignificant
Port Meadow with Wolvercote Common & Green SSSI	<0.01	<0.01	Insignificant
Rock Edge SSSI	<0.01	<0.01	Insignificant
Streatley Warren SSSI	<0.01	<0.01	Insignificant
Sugworth SSSI	<0.01	<0.01	Insignificant
Warren Bank SSSI	<0.01	<0.01	Insignificant
Wytham Woods SSSI	<0.01	<0.01	Insignificant

In line with step 1 of the screening process, the annual mean PC is less than 100% at the Ancient Woodland and less than 1% at the SSSIs and SACs. Therefore, all receptors can be screened out under step 1. Therefore, all receptors can be screened out under step 1 and impact can be considered insignificant.

7.1.3 Acidification.

The deposition of nitrogen and sulphur compounds has been assessed against the relevant critical loads outlined in Table 7.

7.1.3.1 Nitrogen.

Predicted acidification of nitrogen contributions for the ecological receptors are presented in Table 53.

Table 53: Step 1 screening for acidification of nitrogen as a result of the combined testing and maintenance scenarios on ecological receptors.

Name	PC (keq/ha/a)	PC % of Critical Load	Significance
Ancient Woodland	<0.01	2.96	Insignificant
Appleton Lower Common SSSI	<0.01	0.04	Insignificant
Ashridge Wood SSSI	<0.01	0.19	Insignificant
Aston Upthorpe Downs SSSI	<0.01	0.02	Insignificant
Barrow Farm Fen SSSI	<0.01	0.24	Insignificant

Name	PC (keq/ha/a)	PC % of Critical Load	Significance
Brasenose Wood and Shotover Hill SSSI	<0.01	0.28	Insignificant
Cothill Fen SAC	<0.01	0.24	Insignificant
Cothill Fen SSSI	<0.01	0.24	Insignificant
Dry Sandford Pit SSSI	<0.01	0.02	Insignificant
Holies Down SSSI	<0.01	0.01	Insignificant
Iffley Meadows SSSI	<0.01	0.03	Insignificant
Langley's Lane Meadow SSSI	<0.01	<0.01	Insignificant
Lardon Chase SSSI	<0.01	0.01	Insignificant
Moulsford Downs SSSI	<0.01	0.01	Insignificant
New Marston Meadows SSSI	<0.01	0.03	Insignificant
Oxford Meadows SAC	<0.01	0.03	Insignificant
Port Meadow with Wolvercote Co	<0.01	0.03	Insignificant
Streatley Warren SSSI	<0.01	0.02	Insignificant
Warren Bank SSSI	<0.01	0.01	Insignificant
Wytham Woods SSSI	<0.01	0.05	Insignificant

In line with step 1 of the screening process, the annual mean PC is less than 100% at the Ancient Woodland and less than 1% at the SSSIs and SACs. Therefore, all receptors can be screened out under step 1 and impact can be considered insignificant.

7.1.3.2 Sulphur.

Predicted acidification of sulphur contributions for the ecological receptors are presented in Table 54.

Table 54: Step 1 screening for acidification of sulphur as a result of the combined testing and maintenance scenarios on ecological receptors.

Name	PC (keq/ha/a)	PC % of Critical Load	Significance
Ancient Woodland	<0.01	<0.01	Insignificant
Appleton Lower Common SSSI	<0.01	<0.01	Insignificant
Ashridge Wood SSSI	<0.01	<0.01	Insignificant
Aston Upthorpe Downs SSSI	<0.01	<0.01	Insignificant
Barrow Farm Fen SSSI	<0.01	<0.01	Insignificant
Brasenose Wood and Shotover Hill SSSI	<0.01	0.01	Insignificant
Cothill Fen SAC	<0.01	<0.01	Insignificant
Cothill Fen SSSI	<0.01	<0.01	Insignificant
Dry Sandford Pit SSSI	<0.01	0.01	Insignificant
Holies Down SSSI	<0.01	<0.01	Insignificant
Iffley Meadows SSSI	<0.01	<0.01	Insignificant

Name	PC (keq/ha/a)	PC % of Critical Load	Significance
Langley's Lane Meadow SSSI	<0.01	<0.01	Insignificant
Lardon Chase SSSI	<0.01	<0.01	Insignificant
Moulsford Downs SSSI	<0.01	<0.01	Insignificant
New Marston Meadows SSSI	<0.01	<0.01	Insignificant
Oxford Meadows SAC	<0.01	<0.01	Insignificant
Port Meadow with Wolvercote Co	<0.01	<0.01	Insignificant
Streatley Warren SSSI	<0.01	<0.01	Insignificant
Warren Bank SSSI	<0.01	<0.01	Insignificant
Wytham Woods SSSI	<0.01	<0.01	Insignificant

In line with step 1 of the screening process, the annual mean PC is less than 100% at the Ancient Woodland and less than 1% at the SSSIs and SACs. Therefore, all receptors can be screened out under step 1 and impact can be considered insignificant.

7.1.4 Nutrient nitrogen.

The deposition of nutrient nitrogen has been assessed against the relevant critical loads outlined in Table 7.

Table 55: Step 1 screening for nutrient nitrogen from the combined testing and maintenance scenarios on ecological receptors.

Name	PC (kq N/ha/a)	PC % of Critical Load	Significance
Ancient Woodland	0.06	0.59	Insignificant
Appleton Lower Common SSSI	<0.01	0.01	Insignificant
Ashridge Wood SSSI	<0.01	0.02	Insignificant
Aston Upthorpe Downs SSSI	<0.01	0.03	Insignificant
Barrow Farm Fen SSSI	<0.01	0.05	Insignificant
Brasenose Wood and Shotover Hill SSSI	0.01	0.11	Insignificant
Cothill Fen SAC	<0.01	0.05	Insignificant
Cothill Fen SSSI	<0.01	0.05	Insignificant
Dry Sandford Pit SSSI	<0.01	0.05	Insignificant
Frilford Heath Ponds and Fens	<0.01	0.03	Insignificant
Holies Down SSSI	<0.01	0.01	Insignificant
Hurst Hill SSSI	<0.01	0.06	Insignificant
Iffley Meadows SSSI	<0.01	0.05	Insignificant
Langley's Lane Meadow SSSI	<0.01	0.01	Insignificant
Lardon Chase SSSI	<0.01	0.01	Insignificant
Lye Valley SSSI	<0.01	0.02	Insignificant
Moulsford Downs SSSI	<0.01	0.02	Insignificant
New Marston Meadows SSSI	<0.01	0.03	Insignificant

Name	PC (kq N/ha/a)	PC % of Critical Load	Significance
Oxford Meadows SAC	<0.01	0.03	Insignificant
Port Meadow with Wolvercote Common & Green SSSI	<0.01	0.03	Insignificant
Streatley Warren SSSI	<0.01	0.02	Insignificant
Warren Bank SSSI	<0.01	0.01	Insignificant
Wytham Woods SSSI	0.01	0.06	Insignificant

In line with step 1 of the screening process, the annual mean PC is less than 100% at the Ancient Woodland and less than 1% at the SSSIs and SACs. Therefore, all receptors can be screened out under step 1 and impact can be considered insignificant.

7.2 Outage scenario.

The following outlines the results of the dispersion modelling for the 72-hour outage scenario. This scenario considers all generators running simultaneously for 72-hours.

To represent the worst-case meteorological conditions, the maximum concentration from the three modelled years (2022, 2023, 2024) has been presented for each receptor location.

7.2.1 NO_x

The PC predicted in the outage scenario have been compared to the relevant annual mean critical levels for NO_x. In addition, the 24-hour mean NO_x PC has been compared against the 200 µg/m^3 criteria set out by the EA guidance.

7.2.1.1 Annual mean.

Predicted annual mean concentrations for the ecological receptors are presented in Table 56.

Table 56: Step 1 screening for NO_X annual mean from the outage scenario on ecological receptors.

Receptor ID	PC (µg/m^3)	PC % of Critical Level	Significance
Ancient Woodland	0.56	1.88	Insignificant
Appleton Lower Common SSSI	0.02	0.08	Insignificant
Ashridge Wood SSSI	0.04	0.14	Insignificant
Barrow Farm Fen SSSI	0.06	0.19	Insignificant
Brasenose Wood and Shotover Hill SSSI	0.06	0.21	Insignificant
Cothill Fen SAC	0.05	0.18	Insignificant
Cothill Fen SSSI	0.05	0.18	Insignificant
Culham Brake SSSI	0.39	1.31	Potentially significant
Dry Sandford Pit SSSI	0.06	0.20	Insignificant
Frilford Heath Ponds and Fens	0.03	0.11	Insignificant
Holies Down SSSI	0.03	0.09	Insignificant
Hurst Hill SSSI	0.08	0.27	Insignificant
Iffley Meadows SSSI	0.11	0.36	Insignificant

Receptor ID	PC (µg/m^3)	PC % of Critical Level	Significance
Langley's Lane Meadow SSSI	0.01	0.05	Insignificant
Lardon Chase SSSI	0.03	0.11	Insignificant
Lye Valley SSSI	0.07	0.22	Insignificant
Moulsford Downs SSSI	0.04	0.13	Insignificant
New Marston Meadows SSSI	0.07	0.24	Insignificant
Oxford Meadows SAC	0.08	0.26	Insignificant
Port Meadow with Wolvercote Common & Green SSSI	0.08	0.26	Insignificant
Streatley Warren SSSI	0.04	0.14	Insignificant
Warren Bank SSSI	0.03	0.09	Insignificant
Wytham Woods SSSI	0.07	0.25	Insignificant

In line with step 1 of the screening process, the PC for annual mean NO_x exceeds 1% of the critical load at the Culham Brake SSSI, therefore impacts cannot be screened out under step 1. For the remaining ecological receptors, the annual mean PC is less than 100% at the Ancient Woodland and less than 1% at the SSSIs and SACs. Therefore, the impact at these existing receptors can be screened out as being insignificant.

Step 2 of the screening process for Culham Brake is presented in Table 57.

Table 57: Step 2 screening for NO_X annual mean from the outage scenario on ecological receptors.

Receptor ID	PEC (µg/m^3)	PEC % of Critical Level	Significance
Culham Brake SSSI	12.69	42.31	Insignificant

In line with step 2 of the screening process, the PEC at Culham Brake SSSI does not exceed 70% of the annual mean NO_x critical level. Therefore, the impact at this receptor can be screened out as being insignificant.

7.2.1.2 24-hour mean.

The results for a 5% risk of exceedance of the 24-hour mean are shown in Table 58 for step 1 of the screening process.

Table 58: Step 1 screening for NO_X 24-hour mean from the outage scenario on ecological receptors.

Name	PC (µg/m^3)	PC % of Critical Level	Significance
Ancient Woodland	604.34	302.17	Potentially significant
Appleton Lower Common SSSI	26.66	13.33	Potentially significant
Ashridge Wood SSSI	71.76	35.88	Potentially significant
Aston Upthorpe Downs SSSI	88.63	44.31	Potentially significant
Barrow Farm Fen SSSI	70.06	35.03	Potentially significant
Brasenose Wood and Shotover Hill SSSI	88.86	44.43	Potentially significant
Cothill Fen SAC	64.29	32.14	Potentially significant
Cothill Fen SSSI	64.29	32.15	Potentially significant

Name	PC (µg/m^3)	PC % of Critical Level	Significance
Culham Brake SSSI	379.76	189.88	Potentially significant
Cumnor SSSI	75.39	37.69	Potentially significant
Dry Sandford Pit SSSI	71.93	35.97	Potentially significant
Frilford Heath Ponds and Fens	43.43	21.72	Potentially significant
Holies Down SSSI	40.92	20.46	Potentially significant
Hurst Hill SSSI	106.11	53.05	Potentially significant
Iffley Meadows SSSI	116.26	58.13	Potentially significant
Lamb and Flag Quarry SSSI	22.56	11.28	Potentially significant
Langley's Lane Meadow SSSI	20.14	10.07	Potentially significant
Lardon Chase SSSI	44.17	22.08	Potentially significant
Little Wittenham SAC	153.37	76.68	Potentially significant
Little Wittenham SSSI	153.37	76.68	Potentially significant
Littlemore Railway Cutting SSS	123.74	61.87	Potentially significant
Lye Valley SSSI	80.90	40.45	Potentially significant
Magdalen Grove SSSI	86.88	43.44	Potentially significant
Moulsford Downs SSSI	53.00	26.50	Potentially significant
New Marston Meadows SSSI	79.73	39.87	Potentially significant
Oxford Meadows SAC	88.02	44.01	Potentially significant
Port Meadow with Wolvercote Common & Green SSSI	88.02	44.01	Potentially significant
Rock Edge SSSI	69.60	34.80	Potentially significant
Streatley Warren SSSI	65.23	32.61	Potentially significant
Sugworth SSSI	167.16	83.58	Potentially significant
Warren Bank SSSI	42.80	21.40	Potentially significant
Wytham Woods SSSI	91.49	45.75	Potentially significant

In line with step 1 of the screening process, the PC for 24-hour mean NO_x exceeds 1% of the critical load at all relevant SSSIs and SACs, and exceeds 100% of the critical load at the Ancient Woodland (which is the closest sensitive ecological receptor to the site). Therefore, impacts cannot be screened out under step 1.

Step 2 of the screening process for the ecological receptors is presented in Table 59.

Table 59: Step 2 screening for NO_X 24-hour mean from the outage scenario on ecological receptors.

Name	PC (µg/m^3)	PC as a % of the 24-hour mean objective minus twice the long-term background	PEC (µg/m^3)	Significance
Ancient Woodland	604.34	341.05	627.14	Potentially significant

Name	PC (µg/m^3)	PC as a % of the 24-hour mean objective minus twice the long-term background	PEC (µg/m^3)	Significance
Appleton Lower Common SSSI	26.66	14.84	47.06	Potentially significant
Ashridge Wood SSSI	71.76	40.18	93.16	Potentially significant
Aston Upthorpe Downs SSSI	88.63	48.43	105.63	Potentially significant
Barrow Farm Fen SSSI	70.06	39.85	94.26	Potentially significant
Brasenose Wood and Shotover Hill SSSI	88.86	57.33	133.86	Potentially significant
Cothill Fen SAC	64.29	35.92	85.29	Potentially significant
Cothill Fen SSSI	64.29	35.92	85.29	Potentially significant
Culham Brake SSSI	379.76	216.51	404.36	Potentially significant
Cumnor SSSI	75.39	42.40	97.59	Potentially significant
Dry Sandford Pit SSSI	71.93	39.83	91.33	Potentially significant
Frilford Heath Ponds and Fens	43.43	23.92	61.83	Potentially significant
Holies Down SSSI	40.92	22.99	62.92	Potentially significant
Hurst Hill SSSI	106.11	59.68	128.31	Potentially significant
Iffley Meadows SSSI	116.26	69.45	148.86	Potentially significant
Lamb and Flag Quarry SSSI	22.56	12.37	40.16	Potentially significant
Langley's Lane Meadow SSSI	20.14	11.17	39.74	Potentially significant
Lardon Chase SSSI	44.17	24.81	66.17	Potentially significant
Little Wittenham SAC	153.37	86.26	175.57	Potentially significant
Little Wittenham SSSI	153.37	86.26	175.57	Potentially significant
Littlemore Railway Cutting SSS	123.74	73.04	154.34	Potentially significant
Lye Valley SSSI	80.90	47.15	109.30	Potentially significant
Magdalen Grove SSSI	86.88	54.99	128.88	Potentially significant
Moulsford Downs SSSI	53.00	29.25	71.80	Potentially significant
New Marston Meadows SSSI	79.73	47.40	111.53	Potentially significant
Oxford Meadows SAC	88.02	52.21	119.42	Potentially significant

Name	PC (µg/m^3)	PC as a % of the 24-hour mean objective minus twice the long-term background	PEC (µg/m^3)	Significance
Port Meadow with Wolvercote Common & Green SSSI	88.02	52.21	119.42	Potentially significant
Rock Edge SSSI	69.60	42.85	107.20	Potentially significant
Streatley Warren SSSI	65.23	35.76	82.83	Potentially significant
Sugworth SSSI	167.16	96.29	193.56	Potentially significant
Warren Bank SSSI	42.80	23.51	60.80	Potentially significant
Wytham Woods SSSI	91.49	53.69	121.09	Potentially significant

In line with step 2 of the screening process, the 24-hour mean PC exceeds 20% of the 24-hour mean objective minus twice the long term background and subsequently there are potentially significant impacts at all sensitive ecological receptors. However, there is a greater than 5% risk of exceedance of the 200 µg/m^3 level at the Culham Brake SSSI and the Ancient Woodland.

Furthermore, this objective is only considered applicable where there are high concentrations of SO_2 and ozone. The IAQM state that in the UK currently, concentration of SO_2 and ozone are not deemed to be high.

Due to the Site having two substations, the likelihood of a 72-hour power outage occurring simultaneously at both substations and thus requiring the use of the backup plant for the full 72-hour period, is considered highly unlikely, and therefore the modelling is likely to be over precautionary in its assumptions. Regardless of this, IAQM guidance states that the '….*long term effects of NOx are thought to be more significant than the short-term effects*'. The project ecologist has confirmed that the very short-term nature of potentially high NOx emissions associated with the use of the backup plant (which as stated previously is very unlikely to be required) would therefore not reasonably be considered to result in significant changes to the vegetation assemblages of the designated sites, because increased nitrogen uptake would only potentially occur for a few hours at most. It is therefore concluded that effects to the designated sites of the short-term increase in N deposition as a result of NOx emissions from the backup plant would not be significant.

7.2.2 SO_2.

The PC predicted in the combined testing and maintenance scenarios have been compared to the relevant annual mean critical levels for SO_2.

7.2.2.1 Annual mean.

Predicted annual mean concentrations for the ecological receptors are presented in Table 60.

Table 60: Step 1 screening for SO_2 annual mean from the outage scenario on ecological receptors.

Name	PC (µg/m^3)	PC % of Critical Level	Significance
Ancient Woodland	<0.01	0.01	Insignificant
Appleton Lower Common SSSI	<0.01	<0.01	Insignificant
Ashridge Wood SSSI	<0.01	<0.01	Insignificant
Aston Upthorpe Downs SSSI	<0.01	<0.01	Insignificant
Barrow Farm Fen SSSI	<0.01	<0.01	Insignificant

Name	PC (µg/m^3)	PC % of Critical Level	Significance
Brasenose Wood and Shotover Hill SSSI	<0.01	<0.01	Insignificant
Cothill Fen SAC	<0.01	<0.01	Insignificant
Cothill Fen SSSI	<0.01	<0.01	Insignificant
Culham Brake SSSI	<0.01	<0.01	Insignificant
Cumnor SSSI	<0.01	<0.01	Insignificant
Dry Sandford Pit SSSI	<0.01	<0.01	Insignificant
Frilford Heath, Ponds and Fens SSSI	<0.01	<0.01	Insignificant
Holies Down SSSI	<0.01	<0.01	Insignificant
Hurst Hill SSSI	<0.01	<0.01	Insignificant
Iffley Meadows SSSI	<0.01	<0.01	Insignificant
Lamb and Flag Quarry SSSI	<0.01	<0.01	Insignificant
Langley's Lane Meadow SSSI	<0.01	<0.01	Insignificant
Lardon Chase SSSI	<0.01	<0.01	Insignificant
Little Wittenham SAC	<0.01	<0.01	Insignificant
Littlemore Railway Cutting SSSI	<0.01	<0.01	Insignificant
Lye Valley SSSI	<0.01	<0.01	Insignificant
Magdalen Grove SSSI	<0.01	<0.01	Insignificant
Moulsford Downs SSSI	<0.01	<0.01	Insignificant
New Marston Meadows SSSI	<0.01	<0.01	Insignificant
Oxford Meadows SAC	<0.01	<0.01	Insignificant
Port Meadow with Wolvercote Common & Green SSSI	<0.01	<0.01	Insignificant
Rock Edge SSSI	<0.01	<0.01	Insignificant
Streatley Warren SSSI	<0.01	<0.01	Insignificant
Sugworth SSSI	<0.01	<0.01	Insignificant
Warren Bank SSSI	<0.01	<0.01	Insignificant
Wytham Woods SSSI	<0.01	<0.01	Insignificant

In line with step 1 of the screening process, the annual mean PC is less than 100% at the Ancient Woodland and less than 1% at the SSSIs and SACs. Therefore, all receptors can be screened out under step 1 and impact can be considered insignificant.

7.2.3 Acidification.
The deposition of nitrogen and sulphur compounds has been assessed against the relevant critical loads outlined in Table 7.

7.2.3.1 Nitrogen.
Predicted acidification of nitrogen contributions for the ecological receptors are presented in Table 61.

Table 61: Step 1 screening for acidification of nitrogen as a result of the outage scenario on ecological receptors.

Name	PC (keq/ha/a)	PC % of Critical Load	Significance
Ancient Woodland	0.01	8.15	Insignificant
Appleton Lower Common SSSI	<0.01	0.13	Insignificant
Ashridge Wood SSSI	<0.01	0.61	Insignificant
Aston Upthorpe Downs SSSI	<0.01	0.07	Insignificant
Barrow Farm Fen SSSI	<0.01	0.80	Insignificant
Brasenose Wood and Shotover Hill SSSI	<0.01	0.91	Insignificant
Cothill Fen SAC	<0.01	0.79	Insignificant
Cothill Fen SSSI	<0.01	0.79	Insignificant
Dry Sandford Pit SSSI	<0.01	0.07	Insignificant
Holies Down SSSI	<0.01	0.03	Insignificant
Iffley Meadows SSSI	<0.01	0.10	Insignificant
Langley's Lane Meadow SSSI	<0.01	0.01	Insignificant
Lardon Chase SSSI	<0.01	0.04	Insignificant
Moulsford Downs SSSI	<0.01	0.05	Insignificant
New Marston Meadows SSSI	<0.01	0.09	Insignificant
Oxford Meadows SAC	<0.01	0.09	Insignificant
Port Meadow with Wolvercote Co	<0.01	0.09	Insignificant
Streatley Warren SSSI	<0.01	0.05	Insignificant
Warren Bank SSSI	<0.01	0.03	Insignificant
Wytham Woods SSSI	<0.01	0.18	Insignificant

In line with step 1 of the screening process, the annual mean PC is less than 100% at the Ancient Woodland and less than 1% at the SSSIs and SACs. Therefore, all receptors can be screened out under step 1 and impact can be considered insignificant.

7.2.3.2 Sulphur.

Predicted acidification of sulphur contributions for the ecological receptors are presented in Table 62.

Table 62: Step 1 screening for acidification of sulphur as a result of the outage scenarios on ecological receptors.

Name	PC (keq/ha/a)	PC % of Critical Load	Significance
Ancient Woodland	<0.01	<0.01	Insignificant
Appleton Lower Common SSSI	<0.01	<0.01	Insignificant
Ashridge Wood SSSI	<0.01	<0.01	Insignificant
Aston Upthorpe Downs SSSI	<0.01	<0.01	Insignificant
Barrow Farm Fen SSSI	<0.01	<0.01	Insignificant
Brasenose Wood and Shotover Hill SSSI	<0.01	<0.01	Insignificant

Name	PC (keq/ha/a)	PC % of Critical Load	Significance
Cothill Fen SAC	<0.01	<0.01	Insignificant
Cothill Fen SSSI	<0.01	<0.01	Insignificant
Dry Sandford Pit SSSI	<0.01	<0.01	Insignificant
Holies Down SSSI	<0.01	<0.01	Insignificant
Iffley Meadows SSSI	<0.01	<0.01	Insignificant
Langley's Lane Meadow SSSI	<0.01	<0.01	Insignificant
Lardon Chase SSSI	<0.01	<0.01	Insignificant
Moulsford Downs SSSI	<0.01	<0.01	Insignificant
New Marston Meadows SSSI	<0.01	<0.01	Insignificant
Oxford Meadows SAC	<0.01	<0.01	Insignificant
Port Meadow with Wolvercote Co	<0.01	<0.01	Insignificant
Streatley Warren SSSI	<0.01	<0.01	Insignificant
Warren Bank SSSI	<0.01	<0.01	Insignificant
Wytham Woods SSSI	<0.01	<0.01	Insignificant

In line with step 1 of the screening process, the annual mean PC is less than 100% at the Ancient Woodland and less than 1% at the SSSIs and SACs. Therefore, all receptors can be screened out under step 1 and impact can be considered insignificant.

7.2.4 Nutrient nitrogen.

The deposition of nutrient nitrogen has been assessed against the relevant critical loads outlined in Table 7.

The results for a 5% risk of exceedance of the 24-hour mean are shown in Table 63 for step 1 of the screening process.

Table 63: Step 1 screening for nutrient nitrogen from the outage scenario on ecological receptors.

Name	PC (kq N/ha/a)	PC % of Critical Load	Significance
Ancient Woodland	0.16	1.62	Insignificant
Appleton Lower Common SSSI	0.01	0.04	Insignificant
Ashridge Wood SSSI	0.01	0.08	Insignificant
Aston Upthorpe Downs SSSI	0.02	0.16	Insignificant
Barrow Farm Fen SSSI	0.02	0.16	Insignificant
Brasenose Wood and Shotover Hill SSSI	0.02	0.36	Insignificant
Cothill Fen SAC	0.02	0.16	Insignificant
Cothill Fen SSSI	0.02	0.16	Insignificant
Dry Sandford Pit SSSI	0.02	0.35	Insignificant

Name	PC (kq N/ha/a)	PC % of Critical Load	Significance
Frilford Heath Ponds and Fens	0.01	0.18	Insignificant
Holies Down SSSI	0.01	0.08	Insignificant
Hurst Hill SSSI	0.02	0.39	Insignificant
Iffley Meadows SSSI	0.03	0.31	Insignificant
Langley's Lane Meadow SSSI	0.00	0.04	Insignificant
Lardon Chase SSSI	0.01	0.09	Insignificant
Lye Valley SSSI	0.02	0.13	Insignificant
Moulsford Downs SSSI	0.01	0.11	Insignificant
New Marston Meadows SSSI	0.02	0.21	Insignificant
Oxford Meadows SAC	0.02	0.22	Insignificant
Port Meadow with Wolvercote Common & Green SSSI	0.02	0.22	Insignificant
Streatley Warren SSSI	0.01	0.12	Insignificant
Warren Bank SSSI	0.01	0.07	Insignificant
Wytham Woods SSSI	0.02	0.21	Insignificant

In line with step 1 of the screening process, the annual mean PC is less than 100% at the Ancient Woodland and less than 1% at the SSSIs and SACs. Therefore, all receptors can be screened out under step 1 and impact can be considered insignificant.

7.3 Summary of the ecological assessment.

In line with step 1 of the screening process, the impacts from the combined testing and maintenance scenarios were screened to be insignificant for all relevant critical levels and critical loads at all ecological receptors.

The impacts of the backup generators in the 72-hour outage scenario were found to be insignificant following the EA screening steps for the annual mean NO_x, annual mean SO_2, nitrogen acidification, sulphur acidification, and nutrient nitrogen deposition critical levels and critical loads in line with the following the EA screening steps. Potentially significant impacts for the 24-hour mean NO_x critical level were identified, however only Culham Brake SSSI and the Ancient Woodland are predicted to exceed the 200 $\mu g/m^3$ criteria.

However, this objective is only considered applicable where there are high concentrations of SO_2 and ozone, which is not generally considered the current situation in the UK according to the IAQM. Furthermore, due to the Site having two substations, the likelihood of a 72-hour outage occurring simultaneously at both is considered highly unlikely, and therefore the modelling is likely to be over precautionary in its assumptions. However, the project ecologist has confirmed that the very short-term nature of potentially high NOx emissions associated with the use of the backup plant would not reasonably be considered to result in significant changes to the vegetation assemblages of the designated sites, because increased nitrogen uptake would only potentially occur for a few hours at most. It is therefore concluded that effects to the designated sites of the short-term increase in N deposition as a result of NOx emissions from the backup plant would not be significant..

8. Mitigation.

As the impacts on human and ecological sites have been screened out as insignificant or determined to be insignificant where screening out is not possible, further mitigation measures are not considered necessary.

Mitigation measures for air quality impacts have been designed into the scheme. These include:

- Management of the testing and maintenance schedules to prevent the operation of multiple generators simultaneously. This will reduce the short-term impacts of the backup plant.
- The generator flues have been designed with air quality considerations. Strategic air quality modelling informed the flue exhaust height, extending the height of the main generator flue exhausts to 33 m above ground. This will aid the dispersion of pollutants in the vicinity of the Site.
- The selected generator models comply with the BAT.

Overall, the backup plant is not anticipated to have significant impacts on human health receptors based on the screening assessment and professional judgement. Therefore, no additional mitigation is considered to be required in regard to air quality at human health receptors.

No significant effects to sensitive ecological receptors have been identified, and therefore no mitigation is required.

9. Summary and recommendations.

This AERA details the impacts of emissions associated with the testing, maintenance and potential outage operation of the 129 back-up generators to be installed at the Site.

The emissions from the generators have been modelled using ADMS-6 to assess their impact on human health and ecological sites within the vicinity of the installation from operation as part of testing, maintenance and in the case of a 72-hour emergency power outage. Modelling has been undertaken over three meteorological years and the worst case impacts have been presented in this assessment. The assessment considers the impacts from modelled emissions of NO_2, PM_{10}, SO_2, CO and benzene at 61 existing human receptors and 32 ecological receptors in the vicinity of the Site.

The assessment of human health identified that impacts at existing sensitive receptors have been assessed as insignificant or determined to be not significant.

The assessment of ecological receptors identified that impacts associated with the operation of the backup plant in the combined testing and maintenance scenarios were screened to be insignificant. Impacts at ecological receptors in the 72-hour outage scenario were found to be potentially significant impacts for the 24-hour mean NO_x critical level. Due to the Site having two substations, the likelihood of a 72-hour outage is considered an overly conservative assessment and is considered highly unlikely to occur. However, the very short-term nature of potentially high NOx emissions associated with the use of the backup plant would not reasonably be considered to result in significant changes to the vegetation assemblages of the designated sites, because increased nitrogen uptake would only potentially occur for a few hours at most. It is therefore concluded that effects to the designated sites of the short-term increase in N deposition as a result of NOx emissions from the backup plant would not be significant

Overall, the backup plant is not anticipated to have significant impacts on human or ecological receptors under normal operation. In the event of a 72-hour outage scenario, there are potentially significant impacts at human health and ecological receptors. Assessment of the potential for significant effects on ecological receptors has concluded that the very short-term potential increases in nitrogen uptake (in the unlikely event that the backup plant is used) would not significantly affect vegetation assemblages within the designated sites. However, due to a 72-hour outage scenario being highly unlikely to occur, no additional mitigation is considered to be required in regard to air quality.

Glossary.

AERA	Air Emissions Risk Assessment
APIS	Air Pollution Information System
AQMA	Air Quality Management Area
AQO	Air Quality Objective
ASR	Annual Status Report
BAT	Best Available Technique
CO	Carbon Monoxide
Defra	Department for Environment, Food and Rural Affairs
EA	Environment Agency
EAL	Environmental Assessment Level
HC	Hydrocarbons
IED	Industrial Emissions Directive
LAQM	Local Air Quality Management
LCP	Large Combustion Plant
MCPD	Medium Combustion Plant Directive
$\mu g/m^3$	Micrograms per cubic metre
NGET	National Grid Electricity Transmission
NGR	National Grid Reference
NO	Nitrogen monoxide
NO_2	Nitrogen dioxide
NO_X	Nitrogen oxides (taken to be NO_2 + NO)
Objectives	A nationally defined set of health-based concentrations for nine pollutants, seven of which are incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date. There are also vegetation-based objectives for sulphur dioxide and nitrogen oxides
PC	Process Contribution
PEC	Predicted Environmental Concentration
PM_{10}	Particulate matter with an aerodynamic diameter less than 10 micrometres
$PM_{2.5}$	Particulate matter with an aerodynamic diameter less than 2.5 micrometres
SAC	Special Area of Conservation
SO_2	Sulphur Dioxide
SODC	South Oxfordshire District Council
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
Standards	A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal
VoWHDC	Vale of the White Horse District Council

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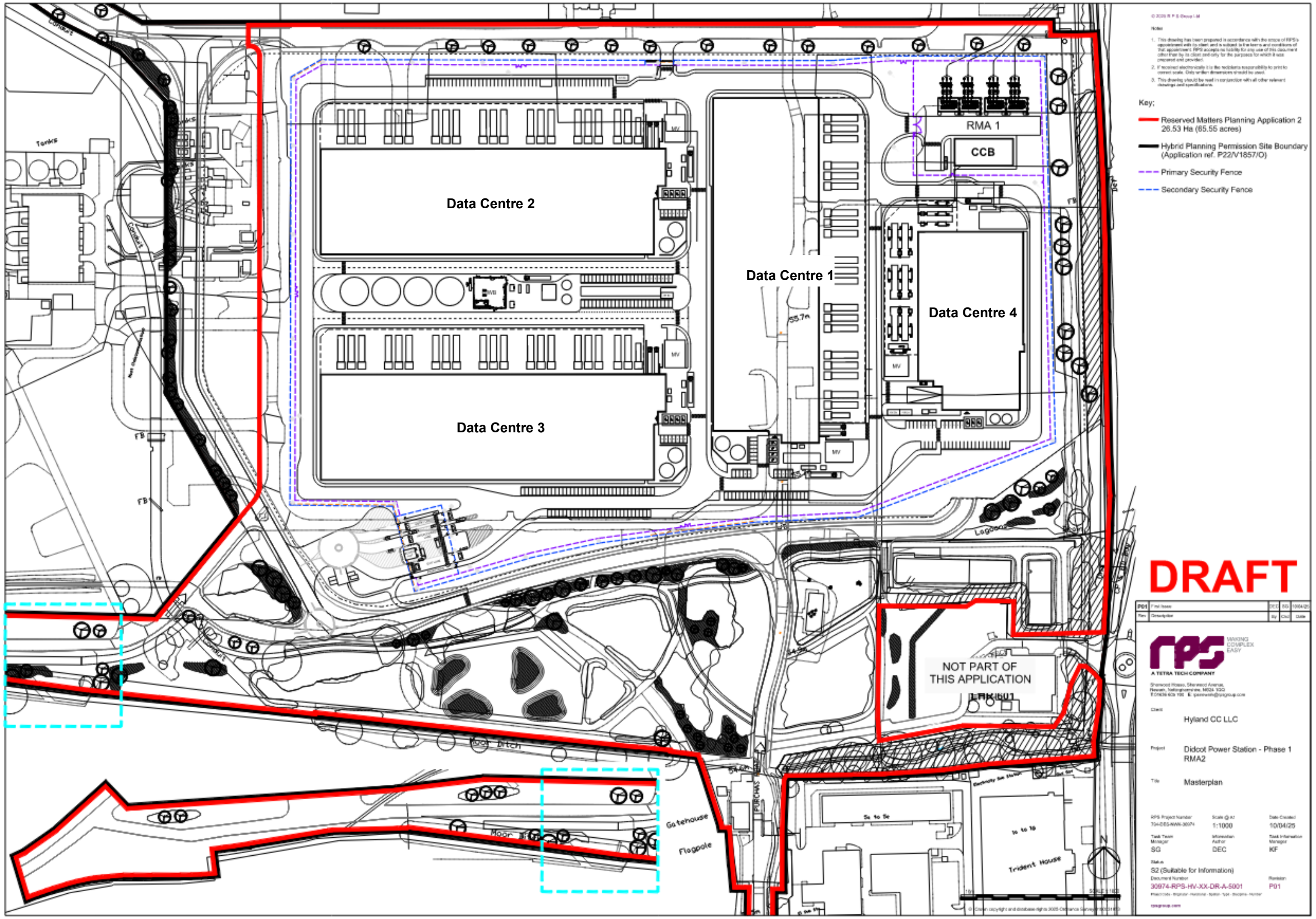
Appendix 1 – Site plan.



Appendix 2 – Energy combustion system model input data.

Energy centre.

The ADMS-6 model has been run to predict the process contribution (PC) of the emissions from the 129 generators. Emissions of NO_2, PM_{10}, SO_2, CO and benzene for all relevant AQOs have been modelled. The generators will only be used for testing and in the event of an outage to the power supply for the installation.

Model input parameters.

The proposals include 129 generators that will only be operational for testing, maintenance and standby power in the case of an emergency power outage from the National Grid.

The change in pollutant concentrations has been modelled using ADMS-6 dispersion modelling software. Entrainment of the plume into the wake of the building (the building downwash effect) has been simulated within the model. Buildings surrounding the proposed stack have also been included in the model.

The generators have been modelled based on the manufacturer's technical specification which assumes the use of diesel fuel. The specifications of the generators used in the model are presented in Table 64.

Table 64: Modelled generator specifications.

Parameter	Main	House	CIWB
Number of Units	122	4	2
Make and Model	AWS QSK95 STD	AWS QSK23-G3	AWS QSX15 G8
Rated power (kW)	2,800	720	440
Exhaust gas temperature (°C)	434	507	503
Normalised exhaust gas volume flow rate (Nm3/s)*	4.40	2.62	0.50
Actual exhaust gas volume flow rate (Am3/s)	10.43	6.84	1.31
Stack diameter (mm)	600	500	300
* Normalised to a target temperature of 25 °C.			

The flow rate has not been normalised for pressure or oxygen content. The exhaust pressure and oxygen content data has not been made available by the generator manufacturer. As such, the following approach has been utilised to calculate emission from the backup plant.

Emission rates for the specified generators has been determined using the Brake Horsepower (BHP) at varying levels of load. The emission rates were provided in the generator data sheets in g/BHP-hr. In order to determine the emissions in g/s for use in the model, they were multiplied by the generator BHP at the relevant level of load and divided by 3600 seconds. These emission rates are presented in Table 65.

Table 65: Calculation of emissions rates.

Parameter	Main	House	CIWB & Substation
BHP at 100% load	4097	963	670
BHP at 20/25% load*	1024	260	149
Emissions in g/BHP-hr			
NOx	4.74	7.45	7.04
CO	0.44	3.21	0.57
PM	0.12	0.07	0.03
SO_2	0.005	0.16	-
HC as Benzene	0.35	0.007	0.05
Emissions rates at 100% load (g/s)			
NOx	5.394383	1.992875	1.310222
CO	0.500744	0.858675	0.106083
PM	0.136567	0.018725	0.005583
SO_2	0.005690	0.042800	-
HC as Benzene	0.398319	0.001873	0.009306
Emissions rates at 20/25% load (g/s) *			
NOx	1.348267	0.538056	0.291378
CO	0.125156	0.231833	0.023592
PM	0.034133	0.005056	0.001242
SO_2	0.001422	0.011556	-
HC as Benzene	0.099556	0.000506	0.002069
* Due to the limitations of the data available, they have been modelled at a load of 25% for the House and Main generators, and 20% for the CIWB & Sub-station generators. "-" indicates that no emissions are recorded for the specified pollutant.			

Flue locations.

The main generators for the data halls are stacked in pairs but have individual flues. The location of the modelled flues is presented in Table 66 and Figure 10.

The flue exhaust heights have been determined in line with stack height analysis presented in Appendix 3. The flue exhaust heights have been determined based on the outputs of the dispersion modelling to ensure there is a low risk of air quality impacts at existing sensitive receptors.

Table 66: Modelled flue locations.

Generator	Easting	Northing	Exhaust height
Data centre 1 House	451492	191723	33.0
Data centre 1 Catcher 1	451494	191736	33.0

Generator	Easting	Northing	Exhaust height
Data centre 1 Catcher 2	451492	191729	33.0
Data centre 1 Main 1	451494	191750	33.0
Data centre 1 Main 2	451494	191749	33.0
Data centre 1 Main 3	451496	191756	33.0
Data centre 1 Main 4	451496	191755	33.0
Data centre 1 Main 5	451497	191763	33.0
Data centre 1 Main 6	451497	191762	33.0
Data centre 1 Main 7	451502	191780	33.0
Data centre 1 Main 8	451502	191779	33.0
Data centre 1 Main 9	451503	191786	33.0
Data centre 1 Main 10	451503	191786	33.0
Data centre 1 Main 11	451505	191793	33.0
Data centre 1 Main 12	451505	191792	33.0
Data centre 1 Main 13	451510	191810	33.0
Data centre 1 Main 14	451510	191809	33.0
Data centre 1 Main 15	451512	191817	33.0
Data centre 1 Main 16	451511	191816	33.0
Data centre 1 Main 17	451513	191823	33.0
Data centre 1 Main 18	451513	191822	33.0
Data centre 1 Main 19	451518	191840	33.0
Data centre 1 Main 20	451518	191839	33.0
Data centre 1 Main 21	451519	191847	33.0
Data centre 1 Main 22	451519	191846	33.0
Data centre 1 Main 23	451521	191853	33.0
Data centre 1 Main 24	451521	191853	33.0
Data centre 1 Main 25	451526	191870	33.0
Data centre 1 Main 26	451525	191869	33.0
Data centre 1 Main 27	451527	191877	33.0
Data centre 1 Main 28	451527	191876	33.0
Data centre 1 Main 29	451529	191884	33.0
Data centre 1 Main 30	451529	191883	33.0
Data centre 1 Main 31	451533	191900	33.0
Data centre 1 Main 32	451533	191900	33.0
Data centre 1 Main 33	451535	191907	33.0

Generator	Easting	Northing	Exhaust height
Data centre 1 Main 34	451535	191906	33.0
Data centre 1 Main 35	451537	191914	33.0
Data centre 1 Main 36	451537	191913	33.0
Data centre 2 House	451408	191935	33.0
Data centre 2 Catcher 1	451402	191935	33.0
Data centre 2 Catcher 2	451395	191936	33.0
Data centre 2 Main 1	451382	191937	33.0
Data centre 2 Main 2	451381	191937	33.0
Data centre 2 Main 3	451375	191939	33.0
Data centre 2 Main 4	451374	191939	33.0
Data centre 2 Main 5	451368	191940	33.0
Data centre 2 Main 6	451367	191941	33.0
Data centre 2 Main 7	451351	191945	33.0
Data centre 2 Main 8	451350	191945	33.0
Data centre 2 Main 9	451344	191947	33.0
Data centre 2 Main 10	451343	191947	33.0
Data centre 2 Main 11	451337	191948	33.0
Data centre 2 Main 12	451336	191948	33.0
Data centre 2 Main 13	451319	191952	33.0
Data centre 2 Main 14	451319	191952	33.0
Data centre 2 Main 15	451313	191954	33.0
Data centre 2 Main 16	451312	191954	33.0
Data centre 2 Main 17	451306	191956	33.0
Data centre 2 Main 18	451305	191956	33.0
Data centre 2 Main 19	451288	191960	33.0
Data centre 2 Main 20	451287	191960	33.0
Data centre 2 Main 21	451282	191962	33.0
Data centre 2 Main 22	451281	191962	33.0
Data centre 2 Main 23	451274	191964	33.0
Data centre 2 Main 24	451274	191964	33.0
Data centre 2 Main 25	451257	191968	33.0
Data centre 2 Main 26	451256	191968	33.0
Data centre 2 Main 27	451250	191969	33.0
Data centre 2 Main 28	451249	191970	33.0

Generator	Easting	Northing	Exhaust height
Data centre 2 Main 29	451243	191971	33.0
Data centre 2 Main 30	451242	191971	33.0
Data centre 2 Main 31	451226	191975	33.0
Data centre 2 Main 32	451225	191975	33.0
Data centre 2 Main 33	451219	191977	33.0
Data centre 2 Main 34	451218	191977	33.0
Data centre 2 Main 35	451212	191979	33.0
Data centre 2 Main 36	451211	191979	33.0
Data centre 3 House	451371	191792	33.0
Data centre 3 Catcher 1	451365	191792	33.0
Data centre 3 Catcher 2	451358	191793	33.0
Data centre 3 Main 1	451343	191794	33.0
Data centre 3 Main 2	451344	191794	33.0
Data centre 3 Main 3	451336	191796	33.0
Data centre 3 Main 4	451337	191796	33.0
Data centre 3 Main 5	451329	191798	33.0
Data centre 3 Main 6	451330	191797	33.0
Data centre 3 Main 7	451312	191802	33.0
Data centre 3 Main 8	451313	191802	33.0
Data centre 3 Main 9	451305	191804	33.0
Data centre 3 Main 10	451306	191804	33.0
Data centre 3 Main 11	451298	191805	33.0
Data centre 3 Main 12	451299	191805	33.0
Data centre 3 Main 13	451281	191809	33.0
Data centre 3 Main 14	451281	191809	33.0
Data centre 3 Main 15	451274	191811	33.0
Data centre 3 Main 16	451275	191811	33.0
Data centre 3 Main 17	451267	191813	33.0
Data centre 3 Main 18	451268	191812	33.0
Data centre 3 Main 19	451250	191817	33.0
Data centre 3 Main 20	451250	191817	33.0
Data centre 3 Main 21	451243	191819	33.0
Data centre 3 Main 22	451243	191819	33.0
Data centre 3 Main 23	451236	191821	33.0

Generator	Easting	Northing	Exhaust height
Data centre 3 Main 24	451236	191820	33.0
Data centre 3 Main 25	451218	191825	33.0
Data centre 3 Main 26	451219	191825	33.0
Data centre 3 Main 27	451212	191827	33.0
Data centre 3 Main 28	451212	191826	33.0
Data centre 3 Main 29	451205	191828	33.0
Data centre 3 Main 30	451205	191828	33.0
Data centre 3 Main 31	451187	191832	33.0
Data centre 3 Main 32	451188	191832	33.0
Data centre 3 Main 33	451181	191834	33.0
Data centre 3 Main 34	451181	191834	33.0
Data centre 3 Main 35	451174	191836	33.0
Data centre 3 Main 36	451174	191836	33.0
Data centre 4 House	451545	191758	18.0
Data centre 4 Main 1	451554	191778	18.0
Data centre 4 Main 2	451554	191779	18.0
Data centre 4 Main 3	451559	191797	18.0
Data centre 4 Main 4	451559	191796	18.0
Data centre 4 Main 5	451564	191816	18.0
Data centre 4 Main 6	451564	191817	18.0
Data centre 4 Main 7	451582	191832	18.0
Data centre 4 Main 8	451581	191832	18.0
CIWB 1	451304	191848	11.3
CIWB 2	451295	191850	11.3
Substation	451591	191868	1.5

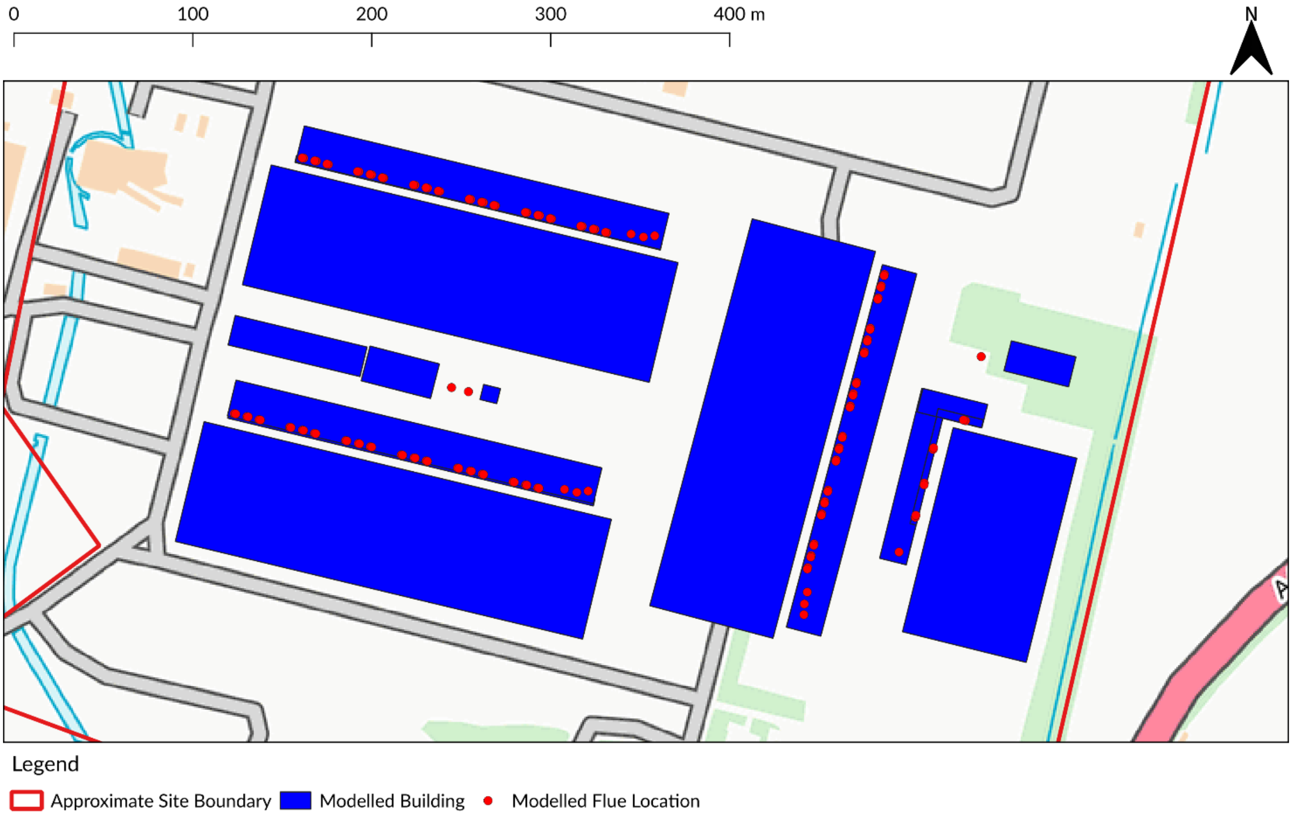


Figure 10: Flue locations and buildings included in the model. Contains Ordnance Survey Data © Crown Copyright and Database rights 2024.

Meteorological data.

The meteorological site at Benson airfield is considered representative of the Site and the prevailing wind direction is dominated by south and south westerly directions as shown in Figure 11. This is likely to disperse emissions from the backup plant to the north and north east of the Site. Impacts from all three years have been assessed, and worst-case concentrations from across the three meteorological years have been presented for each existing sensitive receptor location. This ensures a robust approach that captures a wide range of possible meteorological conditions in the area.

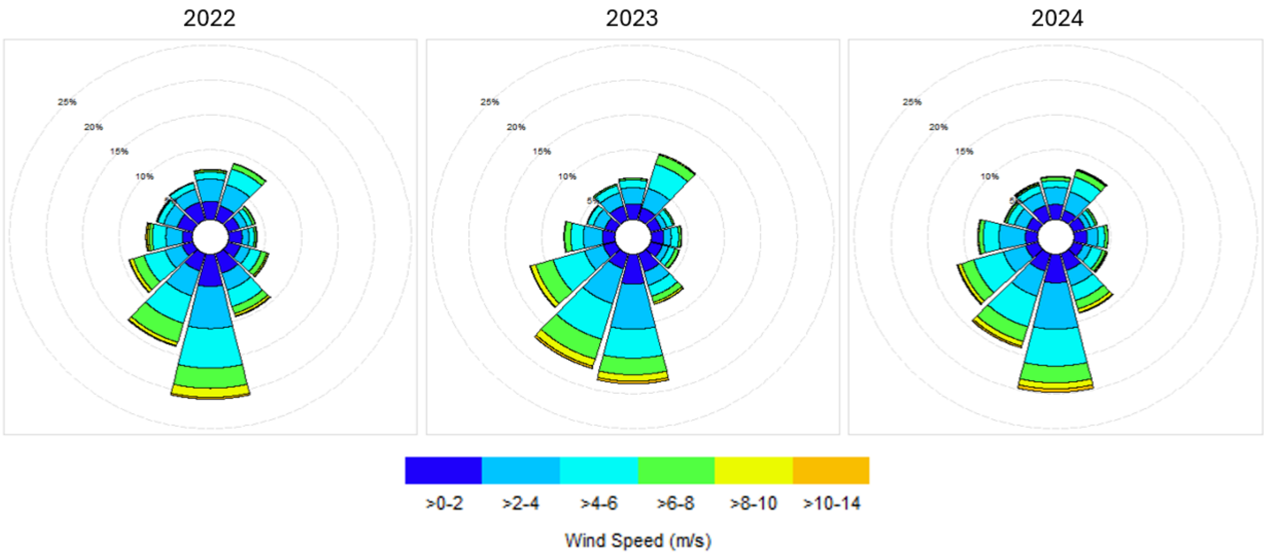


Figure 11: Wind roses for Benson Airfield in 2022, 2023 and 2024.

Table 67 shows the values for surface roughness and the Monin-Obukhov length inputs used in the model.

Table 67: Meteorological data settings used in ADMS 6.

Meteorology		Value
Monin-Obukhov Length (m)	Dispersion Site	30
	Meteorological Measurement Site	10
Surface Roughness (m)	Dispersion Site	0.5
	Meteorological Measurement Site	0.2

Appendix 3 – Stack height analysis.

A stack height analysis has been undertaken to establish the height at which there is a low risk of air quality impacts at existing sensitive receptors. Although there is no current guidance available for stack height analysis, this has been completed in consideration of the guidance published by the EA (Horizontal Guidance Note EPR H1, 2010) which was removed in 2016. However, this stack height analysis has been carried out in consideration of the guidance which required the identification of *"an option that gives acceptable environmental performance but balances costs and benefits of implementing it."*

The stack height analysis has considered the flues for generators associated with the two-storey data halls, which are the most frequent type within the backup plant using the dispersion modelling software, ADMS 6.

NO_2 impacts associated with the testing & maintenance scenarios at a single generator in a central location within the Site has been reviewed. The testing & maintenance scenarios have been reviewed as they represent the 'planned' operation of the backup plant.

Model inputs and emissions data aligns with the inputs detailed in Appendix 2. A full year of meteorological data has been modelled for this stack height analysis. As only one generator will be operational at any one time during the testing & maintenance scenarios, a single stack has been modelled, with annual mean impacts factored to the cumulative operational hours in the maintenance scenario.

Stack heights between 30 m and 35 m, at 1 m intervals, have been considered. This represents a minimum height of 1 m above the two-storey data halls, rounded to the nearest whole number. Maximum process contributions across a 3 km x 3 km grid with a 100 m resolution have been compared. These have been presented in Figure 12 as a percentage of the relevant objectives.

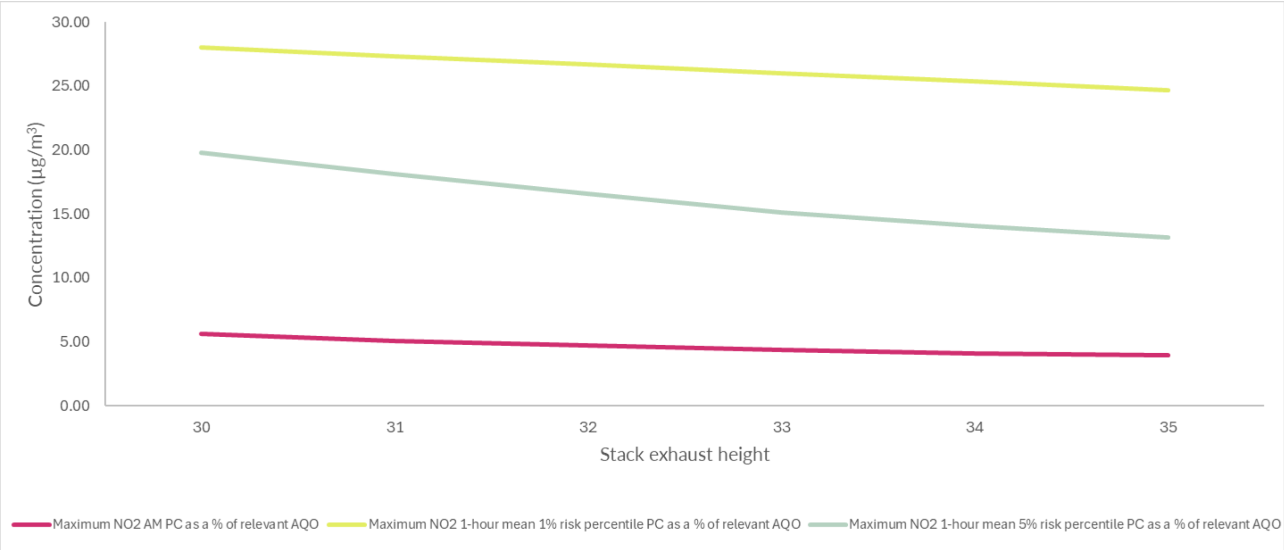


Figure 12: Variation in maximum PC with stack height.

As illustrated in Figure 12, the graph indicates that there is a reduced improvement in PC from 33 m and above. Therefore, there would not be an appreciable improvement in environmental performance if the stack height increased between 33 m and 35 m. As such, a stack height of 33 m has been used for the generators associated with the two-storey data halls have been used, as this is at least 3 m above the highest point of the buildings, in line with best practices.

Appendix 4 – Additional results.

1. 5% risk – Human health full results.

This section contains the full human health results for the annual mean and 5% risk short-term objectives.

1.1 NO_2.

1.1.1 Annual mean.

Table 68: Full results for the NO_2 annual mean PC.

Receptor ID	PC in Testing & Maintenance scenarios ($\mu g/m^3$)	PC in Outage Scenario ($\mu g/m^3$)
R1	0.89	1.80
R2	0.11	0.30
R3	0.29	0.66
R4	0.11	0.31
R5	0.46	1.00
R6	0.29	0.71
R7	0.32	0.83
R8	0.09	0.28
R9	0.24	0.55
R10	0.36	0.85
R11	0.40	1.08
R12	0.13	0.36
R13	0.07	0.22
R14	0.07	0.22
R15	0.18	0.45
R16	0.08	0.24
R17	0.21	0.58
R18	0.36	1.10
R19	0.07	0.21
R20	0.27	0.72
R21	0.10	0.29
R22	0.18	0.44
R23	0.14	0.38
R24	0.09	0.27
R25	0.21	0.59
R26	0.11	0.31

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R27	0.10	0.29
R28	0.11	0.31
R29	0.09	0.27
R30	0.04	0.12
R31	0.08	0.23
R32	0.15	0.43
R33	0.18	0.52
R34	0.11	0.34
R35	0.18	0.51
R36	0.06	0.20
R37	0.20	0.64
R38	0.09	0.27
R39	0.04	0.12
R40	0.06	0.18
R41	0.08	0.26
R42	0.18	0.57
R43	0.03	0.11
R44	0.10	0.30
R45	0.08	0.25
R46	0.13	0.41
R47	0.12	0.39
R48	0.07	0.20
R49	0.11	0.38
R50	0.09	0.29
R51	0.11	0.36
R52	0.05	0.17
R53	0.08	0.23
R54	0.07	0.24
R55	0.07	0.21
R56	0.08	0.24
R57	0.07	0.24
R58	0.05	0.15
R59	0.06	0.19

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R60	0.07	0.22
R61	0.06	0.21

1.1.2 1-hour mean.

Table 69: Full results for the NO_2 1-hour mean PC at the 5% risk percentile.

Receptor ID	Testing & Maintenance Scenarios (µg/m^3)		Outage Scenario (µg/m^3)	
	PC	PEC	PC	PEC
R1	21.55	38.66	33.36	50.46
R2	6.56	23.17	<0.01	16.62
R3	10.34	27.45	1.74	18.85
R4	4.53	23.24	<0.01	18.70
R5	8.34	23.93	37.79	53.38
R6	6.91	24.02	4.82	21.93
R7	7.93	24.55	0.67	17.28
R8	4.05	22.76	<0.01	18.70
R9	6.20	22.55	3.25	19.61
R10	6.70	22.29	49.64	65.23
R11	6.71	22.29	153.71	169.28
R12	5.43	22.11	<0.01	16.68
R13	3.19	21.89	<0.01	18.70
R14	3.13	18.95	<0.01	15.82
R15	5.88	22.56	0.12	16.80
R16	3.12	18.94	0.01	15.83
R17	5.66	20.37	0.05	14.76
R18	6.89	22.47	153.19	168.77
R19	3.02	18.83	<0.01	15.82
R20	5.36	20.95	53.80	69.39
R21	4.25	20.92	<0.01	16.68
R22	5.22	21.57	0.70	17.05
R23	4.49	19.20	<0.01	14.71
R24	4.62	21.29	<0.01	16.68
R25	4.51	20.18	47.03	62.70
R26	4.13	19.95	1.94	17.76

Receptor ID	Testing & Maintenance Scenarios (µg/m^3)		Outage Scenario (µg/m^3)	
	PC	PEC	PC	PEC
R27	4.65	21.00	<0.01	16.35
R28	4.81	21.17	0.01	16.36
R29	4.46	21.69	<0.01	17.23
R30	2.15	21.36	<0.01	19.21
R31	4.28	21.51	<0.01	17.23
R32	4.66	20.48	10.26	26.08
R33	4.17	19.84	43.16	58.83
R34	4.05	18.79	0.04	14.79
R35	4.37	20.04	49.25	64.93
R36	3.18	19.31	<0.01	16.13
R37	4.54	23.02	58.53	77.01
R38	3.81	20.14	0.03	16.36
R39	1.99	17.81	<0.01	15.82
R40	3.70	19.84	<0.01	16.13
R41	3.55	19.88	0.02	16.35
R42	4.36	21.13	38.40	55.16
R43	1.94	17.24	<0.01	15.30
R44	3.56	18.30	<0.01	14.75
R45	3.16	19.92	2.55	19.32
R46	3.37	19.47	22.77	38.88
R47	3.33	19.43	26.95	43.06
R48	2.13	16.45	2.00	16.33
R49	3.10	18.96	27.09	42.95
R50	2.68	18.98	17.90	34.19
R51	2.91	18.77	33.64	49.50
R52	2.22	19.27	0.97	18.02
R53	2.36	19.02	12.40	29.06
R54	2.53	18.63	6.30	22.40
R55	2.20	18.86	11.68	28.34
R56	2.14	18.54	18.27	34.68
R57	2.12	18.49	10.49	26.86
R58	1.99	20.85	1.40	20.26
R59	1.98	18.35	4.80	21.17

Receptor ID	Testing & Maintenance Scenarios (µg/m^3)		Outage Scenario (µg/m^3)	
	PC	PEC	PC	PEC
R60	1.81	18.33	16.11	32.63
R61	1.89	20.78	7.98	26.86

1.2 PM_{10}.

1.2.1 Annual mean.

Table 70: Full results for the PM_{10} annual mean PC.

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R1	0.03	0.16
R2	<0.01	0.03
R3	0.01	0.06
R4	<0.01	0.03
R5	0.02	0.09
R6	0.01	0.06
R7	0.01	0.07
R8	<0.01	0.02
R9	0.01	0.05
R10	0.01	0.08
R11	0.02	0.10
R12	0.01	0.03
R13	<0.01	0.02
R14	<0.01	0.02
R15	0.01	0.04
R16	<0.01	0.02
R17	0.01	0.05
R18	0.01	0.10
R19	<0.01	0.02
R20	0.01	0.06
R21	<0.01	0.03
R22	0.01	0.04
R23	<0.01	0.03
R24	<0.01	0.02
R25	0.01	0.05

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R26	<0.01	0.03
R27	<0.01	0.03
R28	<0.01	0.03
R29	<0.01	0.02
R30	<0.01	0.01
R31	<0.01	0.02
R32	0.01	0.04
R33	0.01	0.05
R34	<0.01	0.03
R35	0.01	0.05
R36	<0.01	0.02
R37	0.01	0.06
R38	<0.01	0.02
R39	<0.01	0.01
R40	<0.01	0.02
R41	<0.01	0.02
R42	0.01	0.05
R43	<0.01	0.01
R44	<0.01	0.03
R45	<0.01	0.02
R46	<0.01	0.04
R47	<0.01	0.04
R48	<0.01	0.02
R49	<0.01	0.03
R50	<0.01	0.03
R51	<0.01	0.03
R52	<0.01	0.02
R53	<0.01	0.02
R54	<0.01	0.02
R55	<0.01	0.02
R56	<0.01	0.02
R57	<0.01	0.02
R58	<0.01	0.01

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R59	<0.01	0.02
R60	<0.01	0.02
R61	<0.01	0.02

1.2.1.1 24-hour mean.

Table 71: Full results for the PM_{10} 24-hour mean at the 5% risk percentile.

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)
R1	<0.01
R2	<0.01
R3	<0.01
R4	<0.01
R5	<0.01
R6	<0.01
R7	<0.01
R8	<0.01
R9	<0.01
R10	<0.01
R11	<0.01
R12	<0.01
R13	<0.01
R14	<0.01
R15	<0.01
R16	<0.01
R17	<0.01
R18	<0.01
R19	<0.01
R20	<0.01
R21	<0.01
R22	<0.01
R23	<0.01
R24	<0.01
R25	<0.01
R26	<0.01

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)
R27	<0.01
R28	<0.01
R29	<0.01
R30	<0.01
R31	<0.01
R32	<0.01
R33	<0.01
R34	<0.01
R35	<0.01
R36	<0.01
R37	<0.01
R38	<0.01
R39	<0.01
R40	<0.01
R41	<0.01
R42	<0.01
R43	<0.01
R44	<0.01
R45	<0.01
R46	<0.01
R47	<0.01
R48	<0.01
R49	<0.01
R50	<0.01
R51	<0.01
R52	<0.01
R53	<0.01
R54	<0.01
R55	<0.01
R56	<0.01
R57	<0.01
R58	<0.01
R59	<0.01
R60	<0.01

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)
R61	<0.01

1.3 SO_2.

1.3.1 24-hour mean.

Table 72: Full results for the SO_2 24-hour mean PC at the 5% risk percentile.

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)
R1	0.29
R2	0.04
R3	0.10
R4	0.04
R5	0.10
R6	0.08
R7	0.07
R8	0.03
R9	0.08
R10	0.07
R11	0.07
R12	0.05
R13	0.02
R14	0.03
R15	0.06
R16	0.02
R17	0.05
R18	0.07
R19	0.02
R20	0.06
R21	0.04
R22	0.05
R23	0.03
R24	0.04
R25	0.04
R26	0.03
R27	0.03
R28	0.03
R29	0.03

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)
R30	0.01
R31	0.03
R32	0.04
R33	0.04
R34	0.03
R35	0.04
R36	0.02
R37	0.05
R38	0.03
R39	0.01
R40	0.02
R41	0.03
R42	0.05
R43	0.01
R44	0.02
R45	0.02
R46	0.04
R47	0.04
R48	0.02
R49	0.03
R50	0.02
R51	0.03
R52	0.01
R53	0.02
R54	0.02
R55	0.02
R56	0.02
R57	0.02
R58	0.01
R59	0.02
R60	0.02
R61	0.02

1.3.2 1-hour mean.

Table 73: Full results for the SO_2 1-hour mean PC at the 5% risk percentile.

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R1	0.54	<0.01
R2	0.11	<0.01
R3	0.25	<0.01
R4	0.09	<0.01
R5	0.19	0.01
R6	0.17	<0.01
R7	0.15	<0.01
R8	0.08	<0.01
R9	0.16	<0.01
R10	0.14	0.03
R11	0.15	0.36
R12	0.12	<0.01
R13	0.06	<0.01
R14	0.06	<0.01
R15	0.13	<0.01
R16	0.05	<0.01
R17	0.11	<0.01
R18	0.16	0.32
R19	0.06	<0.01
R20	0.12	0.04
R21	0.11	<0.01
R22	0.12	<0.01
R23	0.10	<0.01
R24	0.10	<0.01
R25	0.10	0.04
R26	0.08	<0.01
R27	0.10	<0.01
R28	0.10	<0.01
R29	0.09	<0.01
R30	0.04	<0.01
R31	0.08	<0.01
R32	0.10	<0.01
R33	0.10	0.03

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R34	0.08	<0.01
R35	0.09	0.03
R36	0.07	<0.01
R37	0.11	0.05
R38	0.09	<0.01
R39	0.04	<0.01
R40	0.06	<0.01
R41	0.09	<0.01
R42	0.10	0.03
R43	0.03	<0.01
R44	0.07	<0.01
R45	0.06	<0.01
R46	0.08	0.01
R47	0.08	0.01
R48	0.04	<0.01
R49	0.07	0.01
R50	0.06	0.01
R51	0.06	0.01
R52	0.05	<0.01
R53	0.05	<0.01
R54	0.05	<0.01
R55	0.05	<0.01
R56	0.05	0.01
R57	0.05	<0.01
R58	0.04	<0.01
R59	0.04	<0.01
R60	0.04	<0.01
R61	0.04	<0.01

1.3.3 15-minute mean.

Table 74: Full results for the SO_2 15-minute mean at the 5% risk percentile.

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R1	0.76	3.42
R2	0.22	<0.01
R3	0.46	0.55
R4	0.16	0.01
R5	0.29	1.62
R6	0.27	1.12
R7	0.24	1.34
R8	0.15	0.01
R9	0.26	0.73
R10	0.25	1.32
R11	0.24	1.36
R12	0.21	0.09
R13	0.14	0.01
R14	0.14	0.01
R15	0.22	0.28
R16	0.14	0.05
R17	0.19	0.89
R18	0.27	1.41
R19	0.13	<0.01
R20	0.23	0.94
R21	0.20	0.04
R22	0.21	0.54
R23	0.18	0.35
R24	0.19	0.02
R25	0.19	0.73
R26	0.14	0.22
R27	0.20	0.07
R28	0.21	0.13
R29	0.19	0.06
R30	0.12	<0.01
R31	0.20	0.01
R32	0.15	0.44

Receptor ID	PC in Testing & Maintenance scenarios ($\mu g/m^3$)	PC in Outage Scenario ($\mu g/m^3$)
R33	0.16	0.68
R34	0.15	0.37
R35	0.18	0.63
R36	0.15	0.01
R37	0.18	0.71
R38	0.17	0.13
R39	0.10	<0.01
R40	0.15	0.01
R41	0.17	0.08
R42	0.17	0.60
R43	0.10	<0.01
R44	0.13	0.34
R45	0.11	0.21
R46	0.13	0.42
R47	0.13	0.38
R48	0.09	0.21
R49	0.11	0.39
R50	0.10	0.29
R51	0.10	0.39
R52	0.08	0.12
R53	0.08	0.27
R54	0.09	0.21
R55	0.09	0.24
R56	0.08	0.25
R57	0.08	0.22
R58	0.06	0.12
R59	0.07	0.15
R60	0.06	0.22
R61	0.07	0.20

1.4 CO.

1.4.1 8-hour mean.

Table 75: Full results for the CO 8-hour mean PC at the 5% risk percentile.

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R1	9.29	221.06
R2	3.73	127.66
R3	5.99	143.21
R4	2.84	103.57
R5	4.70	144.86
R6	4.50	117.03
R7	4.41	123.94
R8	2.86	91.53
R9	4.20	110.35
R10	5.03	129.48
R11	4.00	105.27
R12	4.93	104.04
R13	2.41	77.57
R14	2.61	82.02
R15	4.77	115.01
R16	2.91	81.85
R17	3.91	99.76
R18	4.31	123.43
R19	2.51	77.52
R20	4.27	113.79
R21	3.76	100.29
R22	3.06	91.82
R23	3.52	93.96
R24	3.87	101.43
R25	3.51	102.38
R26	2.58	86.18
R27	3.41	104.44
R28	4.03	99.80
R29	3.35	103.73
R30	2.19	73.67
R31	3.32	102.65

Receptor ID	PC in Testing & Maintenance scenarios ($\mu g/m^3$)	PC in Outage Scenario ($\mu g/m^3$)
R32	2.63	103.12
R33	2.75	96.64
R34	2.63	81.70
R35	2.57	87.93
R36	2.69	83.52
R37	2.63	102.59
R38	3.01	88.49
R39	1.83	59.47
R40	2.46	82.83
R41	2.76	87.68
R42	2.89	99.66
R43	1.88	63.82
R44	2.67	79.04
R45	1.57	73.60
R46	2.21	77.80
R47	2.15	80.35
R48	1.81	57.40
R49	1.96	69.42
R50	1.85	68.72
R51	1.86	67.37
R52	1.45	58.27
R53	1.51	55.90
R54	1.60	59.95
R55	1.60	50.65
R56	1.44	53.82
R57	1.25	50.66
R58	1.10	46.99
R59	1.17	48.97
R60	1.08	44.66
R61	1.08	45.23

1.4.2 1-hour mean.

Table 76: Full results for the CO 1-hour mean PC at the 5% risk percentile.

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R1	13.28	329.46
R2	5.33	182.37
R3	8.55	206.97
R4	4.06	151.24
R5	6.72	208.08
R6	6.43	167.28
R7	6.30	191.89
R8	4.08	145.92
R9	6.00	157.64
R10	7.19	184.97
R11	5.71	164.88
R12	7.05	159.78
R13	3.44	131.88
R14	3.73	141.14
R15	6.81	171.76
R16	4.16	139.47
R17	5.58	150.04
R18	6.15	177.04
R19	3.58	133.91
R20	6.10	176.38
R21	5.36	149.82
R22	4.37	137.50
R23	5.02	135.87
R24	5.53	147.13
R25	5.02	151.73
R26	3.68	136.95
R27	4.87	149.20
R28	5.76	150.37
R29	4.78	148.19
R30	3.12	107.87
R31	4.75	150.87
R32	3.76	151.27

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R33	3.92	138.06
R34	3.75	126.97
R35	3.67	132.62
R36	3.84	140.80
R37	3.76	153.55
R38	4.30	129.94
R39	2.61	90.77
R40	3.52	123.99
R41	3.94	126.51
R42	4.13	151.50
R43	2.68	91.18
R44	3.81	122.16
R45	2.24	105.14
R46	3.16	120.08
R47	3.07	120.24
R48	2.59	87.63
R49	2.80	99.17
R50	2.65	98.17
R51	2.65	96.24
R52	2.07	83.25
R53	2.15	88.23
R54	2.28	86.34
R55	2.29	79.68
R56	2.06	78.03
R57	1.79	76.75
R58	1.57	67.14
R59	1.67	69.95
R60	1.54	63.80
R61	1.54	66.92

1.5 Benzene.

1.5.1 Annual mean.

Table 77: Full results for the benzene annual mean PC.

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R1	0.08	0.18
R2	0.01	0.03
R3	0.03	0.07
R4	0.01	0.03
R5	0.04	0.10
R6	0.03	0.07
R7	0.03	0.09
R8	0.01	0.03
R9	0.02	0.06
R10	0.03	0.09
R11	0.04	0.11
R12	0.01	0.04
R13	0.01	0.02
R14	0.01	0.02
R15	0.02	0.05
R16	0.01	0.02
R17	0.02	0.06
R18	0.03	0.11
R19	0.01	0.02
R20	0.03	0.07
R21	0.01	0.03
R22	0.02	0.05
R23	0.01	0.04
R24	0.01	0.03
R25	0.02	0.06
R26	0.01	0.03
R27	0.01	0.03
R28	0.01	0.03
R29	0.01	0.03
R30	<0.01	0.01
R31	0.01	0.02

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R32	0.01	0.04
R33	0.02	0.05
R34	0.01	0.04
R35	0.02	0.05
R36	0.01	0.02
R37	0.02	0.07
R38	0.01	0.03
R39	<0.01	0.01
R40	0.01	0.02
R41	0.01	0.03
R42	0.02	0.06
R43	<0.01	0.01
R44	0.01	0.03
R45	0.01	0.03
R46	0.01	0.04
R47	0.01	0.04
R48	0.01	0.02
R49	0.01	0.04
R50	0.01	0.03
R51	0.01	0.04
R52	0.01	0.02
R53	0.01	0.02
R54	0.01	0.02
R55	0.01	0.02
R56	0.01	0.03
R57	0.01	0.02
R58	<0.01	0.02
R59	0.01	0.02
R60	0.01	0.02
R61	0.01	0.02

1.5.2 1-hour mean.

Table 78: Full results for the benzene 1-hour mean PC at the 5% risk percentile.

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R1	6.28	247.38
R2	3.14	137.35
R3	3.60	151.49
R4	1.86	110.83
R5	3.14	153.03
R6	2.84	123.77
R7	2.56	142.65
R8	2.25	107.98
R9	3.12	114.76
R10	3.24	137.48
R11	2.56	123.15
R12	3.04	116.71
R13	2.49	96.53
R14	2.19	104.68
R15	2.91	126.00
R16	2.52	103.14
R17	2.43	111.68
R18	2.71	130.05
R19	2.11	99.16
R20	2.98	130.20
R21	3.00	110.20
R22	2.37	101.16
R23	2.14	99.96
R24	2.23	107.48
R25	2.34	112.17
R26	2.10	100.70
R27	2.44	109.30
R28	2.65	107.88
R29	2.29	106.73
R30	1.85	79.57
R31	2.13	109.31
R32	2.04	114.56

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R33	2.00	101.71
R34	1.80	93.08
R35	1.69	97.22
R36	1.69	102.15
R37	1.76	112.26
R38	1.87	94.34
R39	1.26	66.86
R40	1.73	89.30
R41	1.79	92.52
R42	1.72	112.48
R43	1.32	67.59
R44	1.69	89.90
R45	1.44	77.99
R46	1.43	88.57
R47	1.39	88.72
R48	1.09	64.24
R49	1.32	74.10
R50	1.18	72.74
R51	1.26	71.40
R52	1.00	61.74
R53	1.04	65.39
R54	1.13	63.92
R55	1.01	59.09
R56	0.94	57.88
R57	0.87	57.32
R58	0.84	49.92
R59	0.82	52.59
R60	0.73	47.44
R61	0.74	49.83

2. 1% risk – Human health results.

This section contains the full results for the human health results for the 1% risk short-term objectives.

2.1 NO_2.

2.1.1 1-hour mean.

Table 79: Full results for the NO_2 1-hour mean at the 1% risk percentile.

Receptor ID	Testing & Maintenance scenarios ($\mu g/m^3$)		Outage Scenario ($\mu g/m^3$)	
	PC	PEC	PC	PEC
R1	22.32	39.43	62.84	79.95
R2	6.87	23.48	<0.01	16.62
R3	10.78	27.88	10.80	27.91
R4	4.82	23.53	<0.01	18.71
R5	8.46	24.05	96.20	111.79
R6	7.08	24.18	43.15	60.25
R7	8.09	24.71	18.84	35.45
R8	4.22	22.93	<0.01	18.71
R9	6.34	22.69	19.89	36.25
R10	7.03	22.62	96.90	112.49
R11	6.95	22.53	189.77	205.35
R12	5.53	22.21	0.11	16.78
R13	3.60	22.30	<0.01	18.71
R14	3.56	19.37	<0.01	15.82
R15	6.15	22.82	1.40	18.08
R16	3.28	19.10	0.22	16.05
R17	5.85	20.56	4.67	19.38
R18	7.43	23.00	199.73	215.31
R19	3.40	19.22	<0.01	15.82
R20	5.58	21.17	89.62	105.21
R21	4.42	21.09	0.01	16.68
R22	5.34	21.69	7.83	24.19
R23	4.67	19.38	0.89	15.60
R24	4.83	21.51	<0.01	16.68
R25	4.72	20.39	73.57	89.25
R26	4.51	20.33	8.04	23.86
R27	4.88	21.24	0.04	16.40

Receptor ID	Testing & Maintenance scenarios (µg/m^3)		Outage Scenario (µg/m^3)	
	PC	PEC	PC	PEC
R28	5.04	21.40	0.47	16.82
R29	4.74	21.98	0.02	17.26
R30	2.63	21.84	<0.01	19.21
R31	4.72	21.96	<0.01	17.24
R32	4.92	20.74	20.63	36.46
R33	4.47	20.14	72.36	88.03
R34	4.24	18.99	2.25	16.99
R35	4.41	20.08	74.79	90.46
R36	3.56	19.69	<0.01	16.13
R37	4.78	23.26	86.22	104.70
R38	3.91	20.25	0.39	16.72
R39	2.26	18.08	<0.01	15.82
R40	3.91	20.05	<0.01	16.13
R41	3.97	20.30	0.26	16.59
R42	4.66	21.43	76.75	93.52
R43	2.23	17.53	<0.01	15.30
R44	3.88	18.63	0.60	15.35
R45	3.19	19.96	6.54	23.31
R46	3.45	19.56	49.37	65.48
R47	3.48	19.59	40.37	56.48
R48	2.25	16.57	7.65	21.97
R49	3.13	18.99	43.31	59.17
R50	2.86	19.16	29.78	46.07
R51	2.92	18.78	43.11	58.97
R52	2.36	19.41	2.30	19.35
R53	2.41	19.07	24.20	40.86
R54	2.59	18.70	11.23	27.33
R55	2.30	18.96	22.03	38.70
R56	2.24	18.65	23.69	40.10
R57	2.18	18.55	22.34	38.71
R58	2.01	20.87	3.58	22.44
R59	2.04	18.41	8.45	24.82
R60	1.84	18.36	22.52	39.04

Receptor ID	Testing & Maintenance scenarios (μg/m^3)		Outage Scenario (μg/m^3)	
	PC	PEC	PC	PEC
R61	1.92	20.80	21.62	40.51

2.2 PM_{10}.

2.2.1 24-hour mean.

Table 80: Full results for the PM_{10} 24-hour mean at the 1% risk percentile.

Receptor ID	PC in Testing & Maintenance scenarios (μg/m^3)
R1	<0.01
R2	<0.01
R3	<0.01
R4	<0.01
R5	<0.01
R6	<0.01
R7	<0.01
R8	<0.01
R9	<0.01
R10	<0.01
R11	<0.01
R12	<0.01
R13	<0.01
R14	<0.01
R15	<0.01
R16	<0.01
R17	<0.01
R18	<0.01
R19	<0.01
R20	<0.01
R21	<0.01
R22	<0.01
R23	<0.01
R24	<0.01
R25	<0.01
R26	<0.01
R27	<0.01

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)
R28	<0.01
R29	<0.01
R30	<0.01
R31	<0.01
R32	<0.01
R33	<0.01
R34	<0.01
R35	<0.01
R36	<0.01
R37	<0.01
R38	<0.01
R39	<0.01
R40	<0.01
R41	<0.01
R42	<0.01
R43	<0.01
R44	<0.01
R45	<0.01
R46	<0.01
R47	<0.01
R48	<0.01
R49	<0.01
R50	<0.01
R51	<0.01
R52	<0.01
R53	<0.01
R54	<0.01
R55	<0.01
R56	<0.01
R57	<0.01
R58	<0.01
R59	<0.01
R60	<0.01
R61	<0.01

2.3 SO_2.

2.3.1 24-hour mean.

Table 81: Full results for the SO_2 24-hour mean PC at the 1% risk percentile.

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)
R1	0.31
R2	0.06
R3	0.12
R4	0.05
R5	0.11
R6	0.09
R7	0.08
R8	0.04
R9	0.09
R10	0.08
R11	0.08
R12	0.06
R13	0.03
R14	0.03
R15	0.07
R16	0.03
R17	0.06
R18	0.09
R19	0.03
R20	0.06
R21	0.05
R22	0.06
R23	0.04
R24	0.05
R25	0.05
R26	0.03
R27	0.05
R28	0.05
R29	0.04
R30	0.02
R31	0.04

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)
R32	0.05
R33	0.05
R34	0.04
R35	0.05
R36	0.03
R37	0.06
R38	0.04
R39	0.02
R40	0.02
R41	0.04
R42	0.05
R43	0.02
R44	0.03
R45	0.03
R46	0.04
R47	0.04
R48	0.02
R49	0.03
R50	0.03
R51	0.03
R52	0.02
R53	0.02
R54	0.03
R55	0.02
R56	0.02
R57	0.02
R58	0.02
R59	0.02
R60	0.02
R61	0.02

2.3.2 1-hour mean.

Table 82: Full results for the SO_2 1-hour mean PC at the 1% risk percentile.

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R1	0.54	0.01
R2	0.12	<0.01
R3	0.27	<0.01
R4	0.09	<0.01
R5	0.19	0.05
R6	0.18	<0.01
R7	0.15	<0.01
R8	0.08	<0.01
R9	0.16	<0.01
R10	0.15	0.07
R11	0.15	0.45
R12	0.12	<0.01
R13	0.06	<0.01
R14	0.07	<0.01
R15	0.14	<0.01
R16	0.06	<0.01
R17	0.11	<0.01
R18	0.16	0.39
R19	0.06	<0.01
R20	0.13	0.10
R21	0.11	<0.01
R22	0.13	<0.01
R23	0.10	<0.01
R24	0.10	<0.01
R25	0.11	0.08
R26	0.08	<0.01
R27	0.12	<0.01
R28	0.12	<0.01
R29	0.11	<0.01
R30	0.04	<0.01

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R31	0.09	<0.01
R32	0.10	0.02
R33	0.10	0.06
R34	0.09	<0.01
R35	0.09	0.07
R36	0.07	<0.01
R37	0.11	0.13
R38	0.09	<0.01
R39	0.04	<0.01
R40	0.07	<0.01
R41	0.09	<0.01
R42	0.10	0.06
R43	0.04	<0.01
R44	0.08	<0.01
R45	0.06	<0.01
R46	0.08	0.03
R47	0.08	0.02
R48	0.05	<0.01
R49	0.07	0.06
R50	0.07	0.03
R51	0.07	0.06
R52	0.05	<0.01
R53	0.06	0.01
R54	0.05	<0.01
R55	0.05	0.01
R56	0.05	0.03
R57	0.05	0.01
R58	0.04	<0.01
R59	0.04	<0.01
R60	0.04	0.03
R61	0.04	0.01

2.3.3 15-minute mean.

Table 83: Full results for the SO_2 15-minute mean PC at the 1% risk percentile.

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R1	0.77	3.99
R2	0.22	0.01
R3	0.47	0.81
R4	0.17	0.03
R5	0.29	1.81
R6	0.28	1.30
R7	0.25	1.61
R8	0.16	0.02
R9	0.27	1.02
R10	0.25	1.45
R11	0.24	1.44
R12	0.22	0.19
R13	0.14	0.03
R14	0.14	0.02
R15	0.22	0.46
R16	0.14	0.14
R17	0.20	1.05
R18	0.27	1.49
R19	0.14	0.01
R20	0.24	1.04
R21	0.20	0.09
R22	0.21	0.71
R23	0.18	0.48
R24	0.22	0.04
R25	0.20	0.80
R26	0.14	0.27
R27	0.21	0.14
R28	0.22	0.26
R29	0.20	0.11
R30	0.13	<0.01
R31	0.20	0.04

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R32	0.16	0.50
R33	0.16	0.73
R34	0.16	0.47
R35	0.18	0.67
R36	0.17	0.02
R37	0.18	0.79
R38	0.18	0.19
R39	0.10	<0.01
R40	0.15	0.02
R41	0.17	0.14
R42	0.18	0.70
R43	0.10	<0.01
R44	0.15	0.42
R45	0.11	0.25
R46	0.13	0.49
R47	0.13	0.44
R48	0.10	0.26
R49	0.11	0.45
R50	0.10	0.33
R51	0.10	0.44
R52	0.08	0.15
R53	0.09	0.29
R54	0.09	0.25
R55	0.09	0.27
R56	0.08	0.27
R57	0.08	0.26
R58	0.06	0.14
R59	0.07	0.18
R60	0.06	0.25
R61	0.07	0.24

2.4 CO.

2.4.1 8-hour mean.

Table 84: Full results for the CO 8-hour mean at the 1% risk percentile.

Receptor ID	PC in Testing & Maintenance scenarios (µg/m³)	PC in Outage Scenario (µg/m³)
R1	9.06	208.65
R2	3.15	89.83
R3	5.58	116.30
R4	2.66	76.01
R5	4.56	117.27
R6	4.19	97.26
R7	3.90	107.71
R8	2.63	67.87
R9	3.53	85.78
R10	3.89	96.99
R11	3.01	92.50
R12	3.88	79.53
R13	2.12	48.23
R14	2.14	50.41
R15	3.67	88.10
R16	2.19	48.97
R17	3.38	80.44
R18	3.93	98.02
R19	2.21	47.89
R20	3.85	87.69
R21	2.97	66.66
R22	2.94	73.47
R23	2.89	64.41
R24	3.33	59.20
R25	3.07	75.49
R26	2.23	60.70
R27	3.09	64.32
R28	3.74	67.95
R29	2.82	60.75
R30	1.89	28.13
R31	3.01	54.70

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R32	2.37	78.73
R33	2.58	66.10
R34	2.27	67.10
R35	2.28	72.92
R36	2.43	42.08
R37	2.33	83.26
R38	2.87	55.71
R39	1.56	30.70
R40	2.12	36.04
R41	2.62	54.48
R42	2.17	82.86
R43	1.51	28.41
R44	2.33	53.64
R45	1.45	58.12
R46	1.55	67.20
R47	1.49	65.01
R48	1.41	28.91
R49	1.34	55.07
R50	1.28	43.05
R51	1.25	53.28
R52	1.07	36.76
R53	1.11	31.90
R54	1.10	46.51
R55	1.05	34.38
R56	1.02	38.99
R57	0.99	41.61
R58	0.82	32.49
R59	0.91	37.04
R60	0.76	33.80
R61	0.87	35.78

2.4.2 1-hour mean.

Table 85: Full results for the CO 1-hour mean at the 1% risk percentile.

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R1	13.39	343.91
R2	8.46	216.92
R3	9.76	231.50
R4	4.62	176.73
R5	8.45	240.36
R6	8.22	183.01
R7	6.83	206.65
R8	4.68	163.43
R9	8.94	168.04
R10	7.31	212.67
R11	6.28	175.98
R12	7.65	203.20
R13	4.73	153.16
R14	4.31	157.71
R15	7.67	199.31
R16	4.48	159.27
R17	5.98	182.52
R18	6.75	193.30
R19	4.46	152.90
R20	6.47	212.39
R21	5.96	179.74
R22	5.99	149.85
R23	5.41	155.59
R24	5.91	177.96
R25	5.54	177.50
R26	4.43	178.76
R27	5.32	197.40
R28	5.93	183.92
R29	5.20	176.99
R30	3.98	141.98
R31	5.02	168.29
R32	3.82	171.62

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R33	4.49	159.26
R34	4.00	141.74
R35	3.99	152.25
R36	4.02	150.72
R37	4.03	170.82
R38	4.33	151.89
R39	2.69	125.38
R40	3.65	137.04
R41	3.96	141.53
R42	4.52	170.34
R43	2.88	121.43
R44	4.34	143.78
R45	2.89	119.09
R46	3.41	133.22
R47	3.47	129.52
R48	2.95	105.91
R49	2.98	111.66
R50	2.75	110.78
R51	2.93	109.79
R52	2.48	91.90
R53	2.64	92.85
R54	2.38	101.43
R55	2.38	85.91
R56	2.14	84.39
R57	1.86	82.67
R58	1.66	74.18
R59	1.75	77.20
R60	1.63	71.19
R61	1.54	73.27

2.5 Benzene.

2.5.1 1-hour mean.

Table 86: Full results for the benzene 1-hour mean at the 1% risk percentile.

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R1	6.32	257.32
R2	3.49	161.28
R3	3.60	168.91
R4	2.30	131.44
R5	3.28	178.06
R6	3.10	135.18
R7	3.32	150.73
R8	3.05	120.70
R9	3.30	124.82
R10	3.24	154.96
R11	2.72	130.27
R12	3.07	149.86
R13	2.65	113.25
R14	3.05	115.12
R15	3.30	145.37
R16	2.52	116.86
R17	2.48	134.19
R18	2.79	142.12
R19	2.28	111.09
R20	2.98	156.93
R21	3.00	129.00
R22	2.49	110.54
R23	2.57	115.76
R24	2.28	130.49
R25	2.74	129.83
R26	2.13	131.12
R27	2.51	143.21
R28	2.68	131.83
R29	2.46	131.10
R30	1.89	105.43
R31	2.13	123.47

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R32	2.04	125.85
R33	2.16	116.55
R34	1.81	105.74
R35	2.02	115.08
R36	1.73	108.29
R37	1.93	127.09
R38	1.87	109.18
R39	1.30	92.26
R40	1.73	99.26
R41	1.84	104.74
R42	1.84	127.23
R43	1.32	89.77
R44	1.74	107.78
R45	1.54	88.06
R46	1.58	99.57
R47	1.50	95.99
R48	1.09	78.04
R49	1.32	84.06
R50	1.21	82.66
R51	1.34	81.43
R52	1.13	69.01
R53	1.24	68.83
R54	1.13	74.93
R55	1.09	64.26
R56	0.94	63.49
R57	0.87	62.05
R58	0.84	55.85
R59	0.82	57.51
R60	0.75	53.27
R61	0.74	54.30

3. NO_2 100th percentile 1-hour mean human health results.

The section presents the 100th percentile 1-hour mean NO_2 results for the human health assessment.

3.1 1-hour mean.

Table 87: Full results for the 100th percentile NO_2 1-hour mean PC.

Receptor ID	Testing & Maintenance Scenarios (µg/m^3)		PC in Outage Scenario (µg/m^3)	
	PC	PEC	PC	PEC
R1	30.30	47.41	1352.05	1360.60
R2	16.53	33.14	1619.32	1627.63
R3	17.04	34.15	1645.15	1653.70
R4	10.92	29.63	826.89	836.24
R5	15.53	31.12	1357.23	1365.02
R6	14.71	31.82	1383.82	1392.37
R7	15.76	32.38	1147.89	1156.20
R8	14.45	33.16	822.94	832.29
R9	15.65	32.00	1186.47	1194.65
R10	15.36	30.95	1315.60	1323.39
R11	12.89	28.46	1185.01	1192.80
R12	14.55	31.23	1435.23	1443.57
R13	12.58	31.28	1040.19	1049.54
R14	14.46	30.27	885.36	893.27
R15	15.64	32.31	1422.49	1430.83
R16	11.95	27.77	927.11	935.02
R17	11.76	26.47	1066.57	1073.92
R18	13.20	28.78	1130.71	1138.50
R19	10.80	26.62	933.05	940.96
R20	14.11	29.70	959.35	967.14
R21	14.23	30.90	1167.21	1175.55
R22	11.79	28.14	949.36	957.54
R23	12.17	26.88	969.75	977.11
R24	10.80	27.48	1047.32	1055.66
R25	12.98	28.65	869.92	877.76
R26	10.09	25.91	929.77	937.68
R27	11.89	28.24	897.70	905.87
R28	12.68	29.04	872.83	881.01

Receptor ID	Testing & Maintenance Scenarios (µg/m^3)		PC in Outage Scenario (µg/m^3)	
	PC	PEC	PC	PEC
R29	11.65	28.88	884.20	892.81
R30	8.97	28.18	753.84	763.45
R31	10.11	27.34	832.87	841.49
R32	9.69	25.51	830.50	838.42
R33	10.22	25.90	778.84	786.67
R34	8.60	23.34	754.79	762.17
R35	9.56	25.23	751.07	758.90
R36	8.19	24.33	772.89	780.96
R37	9.16	27.65	696.96	706.21
R38	8.86	25.19	691.58	699.74
R39	6.15	21.96	601.24	609.15
R40	8.21	24.35	742.97	751.03
R41	8.72	25.05	663.80	671.97
R42	8.71	25.47	792.10	800.48
R43	6.28	21.58	575.45	583.10
R44	8.24	22.98	697.52	704.89
R45	7.29	24.06	709.46	717.84
R46	7.51	23.61	686.27	694.32
R47	7.10	23.20	661.20	669.26
R48	5.19	19.51	535.71	542.87
R49	6.26	22.12	590.22	598.14
R50	5.75	22.04	485.27	493.42
R51	6.36	22.22	552.60	560.53
R52	5.36	22.41	498.94	507.46
R53	5.90	22.56	495.29	503.62
R54	5.35	21.46	543.09	551.14
R55	5.19	21.85	543.01	551.35
R56	4.46	20.86	427.57	435.77
R57	4.11	20.48	417.36	425.55
R58	3.96	22.82	408.25	417.68
R59	3.91	20.28	426.32	434.51
R60	3.54	20.06	381.01	389.27
R61	3.50	22.39	386.32	395.76

4. NO Annual mean and 100th percentile 1-hour mean human health results.

The section presents the annual mean and 100th percentile 1-hour mean NO results for the human health assessment.

4.1 Annual mean.

Table 88: Full results for the NO annual mean PC.

Receptor ID	PC in Testing & Maintenance scenarios ($\mu g/m^3$)	PC in Outage Scenario ($\mu g/m^3$)
R1	0.28	0.77
R2	0.04	0.13
R3	0.09	0.28
R4	0.03	0.13
R5	0.14	0.43
R6	0.08	0.30
R7	0.10	0.36
R8	0.03	0.12
R9	0.07	0.24
R10	0.11	0.36
R11	0.12	0.46
R12	0.04	0.15
R13	0.02	0.09
R14	0.02	0.10
R15	0.05	0.19
R16	0.02	0.10
R17	0.06	0.25
R18	0.11	0.47
R19	0.02	0.09
R20	0.08	0.31
R21	0.03	0.12
R22	0.05	0.19
R23	0.04	0.16
R24	0.03	0.12
R25	0.07	0.25
R26	0.03	0.13

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R27	0.03	0.12
R28	0.03	0.13
R29	0.03	0.12
R30	0.01	0.05
R31	0.02	0.10
R32	0.05	0.19
R33	0.06	0.22
R34	0.03	0.15
R35	0.05	0.22
R36	0.02	0.08
R37	0.06	0.27
R38	0.03	0.12
R39	0.01	0.05
R40	0.02	0.08
R41	0.02	0.11
R42	0.06	0.25
R43	0.01	0.05
R44	0.03	0.13
R45	0.03	0.11
R46	0.04	0.18
R47	0.04	0.17
R48	0.02	0.08
R49	0.03	0.16
R50	0.03	0.12
R51	0.03	0.16
R52	0.02	0.07
R53	0.02	0.10
R54	0.02	0.10
R55	0.02	0.09
R56	0.02	0.10
R57	0.02	0.10
R58	0.01	0.07
R59	0.02	0.08

Receptor ID	PC in Testing & Maintenance scenarios (µg/m^3)	PC in Outage Scenario (µg/m^3)
R60	0.02	0.09
R61	0.02	0.09

4.2 1-hour mean.

Table 89: Full results for the 100th percentile NO 1-hour mean PC.

Receptor ID	Testing & Maintenance Scenarios (µg/m^3)		Outage Scenario (µg/m^3)	
	PC	PEC	PC	PEC
R1	56.28	78.37	2510.94	2533.03
R2	30.69	52.09	3007.32	3028.71
R3	31.65	53.74	3055.27	3077.36
R4	20.29	44.64	1535.64	1560.00
R5	28.84	48.84	2520.57	2540.58
R6	27.32	49.41	2569.95	2592.04
R7	29.27	50.67	2131.80	2153.20
R8	26.84	51.19	1528.32	1552.67
R9	29.07	50.11	2203.44	2224.48
R10	28.53	48.54	2443.25	2463.26
R11	23.93	43.92	2200.74	2220.73
R12	27.02	48.52	2665.44	2686.93
R13	23.35	47.70	1931.77	1956.13
R14	26.85	47.16	1644.23	1664.54
R15	29.04	50.53	2641.78	2663.27
R16	22.19	42.52	1721.78	1742.10
R17	21.84	40.62	1980.77	1999.56
R18	24.52	44.51	2099.88	2119.88
R19	20.06	40.37	1732.80	1753.11
R20	26.20	46.20	1781.64	1801.65
R21	26.42	47.92	2167.68	2189.17
R22	21.89	42.94	1763.10	1784.14
R23	22.61	41.39	1800.97	1819.75
R24	20.06	41.56	1945.02	1966.52
R25	24.11	44.23	1615.57	1635.69
R26	18.73	39.05	1726.72	1747.04

Receptor ID	Testing & Maintenance Scenarios (µg/m³)		Outage Scenario (µg/m³)	
	PC	PEC	PC	PEC
R27	22.08	43.12	1667.15	1688.19
R28	23.55	44.60	1620.97	1642.01
R29	21.63	43.91	1642.08	1664.35
R30	16.66	41.70	1400.00	1425.03
R31	18.78	41.05	1546.76	1569.03
R32	17.99	38.31	1542.37	1562.69
R33	18.99	39.11	1446.41	1466.53
R34	15.97	34.80	1401.76	1420.59
R35	17.76	37.88	1394.84	1414.96
R36	15.22	35.96	1435.37	1456.11
R37	17.01	41.06	1294.36	1318.41
R38	16.46	37.47	1284.35	1305.37
R39	11.41	31.72	1116.60	1136.91
R40	15.26	35.99	1379.79	1400.53
R41	16.20	37.21	1232.78	1253.79
R42	16.17	37.80	1471.03	1492.67
R43	11.66	31.25	1068.69	1088.29
R44	15.30	34.13	1295.39	1314.22
R45	13.54	35.18	1317.57	1339.20
R46	13.94	34.65	1274.50	1295.21
R47	13.18	33.89	1227.95	1248.66
R48	9.64	27.92	994.88	1013.16
R49	11.62	32.00	1096.11	1116.49
R50	10.67	31.65	901.22	922.20
R51	11.81	32.18	1026.27	1046.64
R52	9.96	31.98	926.59	948.62
R53	10.96	32.44	919.82	941.31
R54	9.94	30.65	1008.59	1029.30
R55	9.63	31.11	1008.46	1029.94
R56	8.28	29.41	794.06	815.19
R57	7.64	28.71	775.11	796.18
R58	7.36	31.90	758.18	782.72
R59	7.25	28.32	791.74	812.81

Receptor ID	Testing & Maintenance Scenarios (µg/m^3)		Outage Scenario (µg/m^3)	
	PC	PEC	PC	PEC
R60	6.57	27.86	707.58	728.87
R61	6.51	31.08	717.44	742.02

Appendix 5 – Professional experience.

Andy Day (Hoare Lea), BSc (Hons), MSc, AMIEnvSc, MIAQM

Andy is an Associate Air Quality Consultant with Hoare Lea. He is an Associate Member of the Institute of Environmental Sciences and a Full Member of the Institute of Air Quality Management. He is a chemistry graduate with a Master's specialising in the catalysed removal of harmful volatile organic compounds (VOCs) often generated from the combustion of fuel in car engines.

Andy has worked on a range of projects of varying size across a number of different sectors. His experience focusses on work up to and through planning for air quality assessments and environmental impact assessments. Andy also has experience in detailed dispersion modelling of road traffic and energy combustion plant, emission mitigation statements, damage cost calculations, indoor and outdoor air quality monitoring and assessing the air quality impact at ecologically sensitive sites.

Andy has a particular interest in reducing emissions for the benefit of human health and the environment through the life cycle of a building.

Oliver Parsons (Hoare Lea), BSc (Hons), MSc, MIEnvSc, MIAQM

Oliver is a Senior Air Quality Consultant with Hoare Lea. He is a Full Member of the Institution of Environmental Sciences and a Full Member of the Institute of Air Quality Management. He has worked on projects across multiple sectors including residential, commercial and industrial sectors.

He has completed six EIA within the past two years at Hoare Lea including SSEN (film studio), The Galleries (mixed use residential) and SBQ (mixed use residential). He has experience across different aspects of the air quality assessment processes including monitoring, detailed dispersion modelling of roads, standalone air quality assessments and environmental impact assessments.

Alex Johnson (Hoare Lea), MSc, BSc (Hons), AMIEnvSc, AMIAQM

Alex is an Air Quality Consultant with Hoare Lea. He is an Associate Member of the Institution of Environmental Sciences and an Associate Member of the Institute of Air Quality Management. He has worked on a number of air quality projects across various sectors since graduating from the University of Southampton with a master's degree in Environmental Pollution Control.

He has completed a variety of air quality projects at Hoare Lea, including air quality assessments, indoor air quality plans, monitoring analysis, and bespoke technical reports for clients across various sectors. Previously, he has also worked on several projects for Natural England, Defra and the Environment Agency to provide geospatial data analysis and research assistance.

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